

Psycholinguistics

Scientific and technological challenges

Edited by **Leonor SCLiar-CABRAL**

Selected papers: 8th International Congress of the International
Society of Applied Psycholinguistics, ISAPL, Porto Alegre,
Pontifícia Universidade Católica do Rio Grande do Sul, PUCRS November 18-22, 2007

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Porto Alegre, 2010

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CAPA Vinícius Xavier

REVISÃO DE TEXTO Alasdair R. Kerr

REVISÃO FINAL Leonor Scliar-Cabral

EDITORIAÇÃO Supernova Editora

IMPRESSÃO E ACABAMENTO 



EDIPUCRS – Editora Universitária da PUCRS

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Dados Internacionais de Catalogação na Publicação (CIP)

P974 Psycholinguistics: scientific and technological challenges / editado por Leonor Scliar-Cabral. – Porto Alegre : EDIPUCRS, 2010. 407 p.

Apresenta trabalhos selecionados do 8th International ISAPL Congress, realizado na Pontifícia Universidade Católica do Rio Grande do Sul, de 18 a 22 de novembro de 2007.

ISSN 2177-8825

1. Psicolinguística – Congressos. I. Scliar-Cabral, Leonor.
II. International ISAPL Congress (8. : 2007 : Porto Alegre, RS).
III. International Society of Applied Psycholinguistics.

CDD 401.9

Ficha Catalográfica elaborada pelo Setor de Tratamento da Informação da BC-PUCRS.

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Preface

This book contains selected papers presented during the 8th International ISAPL Congress, the first one realized in South America, which was hosted by the Pontifical Catholic University of Rio Grande do Sul (PUCRS), located in Porto Alegre, in its Center of Events, buildings 40 and 41 from November 18-22, 2007. The University was a suitable site for a Congress having courses in psycholinguistics or connected sciences, and offered a nice Campus and buildings, fully equipped with what was needed for the Congress – multimedia conference rooms, a wonderful University restaurant and other facilities.

The topic of the 8th International ISAPL Congress was “*Psycholinguistics: scientific and technological challenges*” (see Prof. Slama-Cazacu’s comments in her key-note, in this volume).

The Local Organizing Committee was formed by José Marcelino Poersch, president of the Congress; Leonor Scliar-Cabral, chair of the local Scientific Commission; Adriana Angelim Rossa, general secretary; Carlos Ricardo Rossa, treasurer and webmaster and Helenita Rosa Franco, chair of the social and cultural activities. During the preparation time and Congress itself, many other colleagues from the Instituto de Letras contributed to the organizational efforts. It should be mentioned that the Department of Extension was in charge of the preparation of the technical equipment.

An International Scientific Committee was organized as follows: Prof. Dr. Tatiana Slama-Cazacu, Romania, ISAPL Honorary President; Prof. Dr. Renzo Titone, Italy, ISAPL Honorary President; Prof. Emeritus Dr. Leonor Scliar-Cabral, Brazil, ISAPL Honorary President; Prof. Dr. Maria da Graça Pinto, Portugal, ISAPL President 2005-2008; Prof. Dr. Christiane Préneron, France, ISAPL Secretary General; Prof. Dr. José Marcelino Poersch, Brazil, ISAPL Treasurer; Prof. Dr. Janusz Arabski, Poland, ISAPL Vice-President; Prof. Dr. Diane Ponterotto, Italy, ISAPL Vice-President; Prof. Dr. Stefania Stame, Italy, ISAPL Coordinator of the Committee Members. The Scientific Committee evaluated 149 abstracts, besides the round tables.

Due to health problems, Dr. Poersch was obliged to quit from the position of President of the 8th ISAPL Congress and Dr. Regina Lamprecht, coordinator of the Graduate Course on Linguistics of PUCRS, took the position.

Both Dr. Regina Lamprecht and Prof. Scliar-Cabral wrote the project to apply to the Brazilian agencies CNPq and CAPES in order to get the necessary funds for the Congress. The project was entirely approved and here we acknowledge publicly the grants, included the funds for publishing this book.

The Congress officially began on November 18, at 8:30, with an Opening Ceremony. The Welcome Address was delivered by the Honorary President of ISAPL,

Prof. Emeritus L. Scliar-Cabral. A warm welcome for all attendants was also given by the Vice-Rector of PUCRS, Prof. Dr. Brother Evilázio Teixeira, on behalf of the Rector, who could not attend. He conveyed best wishes for all the invited guests and participants in this major academic event. He emphasized the importance of the Congress for the University and expressed his thanks for the organizational efforts made and help offered by the authorities of PUCRS. Other speakers were Dr. Solange Ketzer, Pro-Rector of the under-graduate courses of PUCRS; Dr. Regina Lamprecht the president of the 8th ISAPL Congress; Dr. Maria Eunice Moreira, Director of the Faculty of Letters of PUCRS. Brief messages sent by Prof. Dr. T. Slama-Cazacu, Honorary President of ISAPL and by M. G. Pinto, ISAPL's president (2004-2007), both impeded to attend the Congress for health reasons, were read to the audience.

The contents of the selected papers in the present volume agree with the tradition of those published in the proceedings of the past ISAPL Congresses, linked to the sections, already announced in the Circulars and are grouped as follows: Key-note addresses and Plenary presentations; Papers: Language and cognition; Speech comprehension and production; First language acquisition; Second language acquisition/foreign language learning; Psycholinguistic aspects of translation; Psycholinguistics and mass media and Language disorders and speech pathology. Key-note addresses include the contributions of Tatiana Slama-Cazacu (ISAPL Honorary President): "A basic task for scientific psycholinguistics: the right understanding of the term manipulation and the study of the related reality" and Leonor Scliar-Cabral (ISAPL Honorary President): "Applied psycholinguistics goals: priorities". Plenary presentations include the contributions of Lise Menn (Univ. of Colorado): "The art and science of transcribing aphasic (and other) speech"; José Morais (Université Libre de Bruxelles): "Flows of information in and between systems of lexical access" and Giuseppe Mininni (University of Bari): "Applied psycholinguistics as critical discourse analysis: the case of media-ethic dilemmas".

KEY-NOTE ADDRESSES AND PLENARY PRESENTATIONS

Tatiana Slama-Cazacu

University of Bucharest, Romania,
Honorary ISAPL President

A basic task for scientific psycholinguistics: The right understanding of the term manipulation and the study of the related reality

0. A truism or not, let me start by underlining that a basic task of Psycholinguistics (PL) is devoted to Words and their links, in connection with humans' interaction in any Act of communication. Respecting this, I do not intend to give a definition of PL – although, in order to avoid misunderstandings, I should add that PL also includes in its area language learning, or the study of the psychological processes that underlie words processing, and cognition, which is, for humans, a *sine qua non* relation with language etc. These are, however, but subjacent processes and activities included in the fundamental Act of communication, where humans interact and are reciprocally influencing each other and where, in fact, psychological instances are intermingled with the (psycho)linguistic inventory of each individual. Therefore, especially here, I started my allocution by alluding to WORDS, as the milestones of PL and in fact of any scientific study. The risk arises that a Scientist – a Psycholinguist included – might fail to pay enough attention to the exact meaning of Terminology, to Words, and to starting from a clear meaning of some basic terms involved in his/her study. Among such basic, but also fallacious terms, I consider MANIPULATION – which may even bring a study to the edge of generating a real danger for Subjects in a research, and for Humans in general. This term covers, among one of its meanings, an extremely complex reality, to which PL should devote in-depths studies in this paradoxically difficult though tantamount technologically and intellectually developed period of Mankind.

1. Some semantic delineations, clarifications

1.1 The term MANIPULATION etymologically originates from the Latin *manus* 'hand'. It is mostly used as a noun (Eng. and Fr. manipulation) or as a verb (Eng. (to) manipulate, Fr. *manipuler*), with linguistically specific modifications in various languages (though it is not to be found, originally, among the ones included in an older Dictionary, see Modernintern, 1958; but more recently it is used, as a neologism or

not, in other languages as well, as Italian – *manipolazione* –, Spanish – *manipulación* –, Romanian – *manipulare* –, etc.). The basic meaning of MANIPULATION starts from quite concrete actions done with hands: to manipulate, to handle a lever, a crick; or, cf. Larousse, to mix various substances, such as drugs, or flour, or as a therapy in medicine (cf.: Larousse: *manipulation vertébrale*). It also got derivations, such as Fr. Manipulant, i.e., the person who sends telegraphic messages, while the same noun, with the synonym *vatman* means in Romanian ‘tram-driver’ (it is dramatically interesting to mention that this concrete meaning was the only one given in a big Dictionary – DEX – published during the Communist Dictatorship regime by the Romanian Academy, for large masses, and much used at schools: the reason will come out very clearly, when considering what I will be developing further on, but I have to mention here, that this definition remained the same also when the DEX was “revised”, after the Revolution, in the ’90s).

1.2 Let us advance in the more interesting semantic facets of this term, by analyzing it in its profound meanings much developed nowadays. MANIPULATION (with the connected verb) gets a larger diffusion nowadays, with an extension (“figurative”, cf. “metaphoric”, or not) applied to abstract areas, such as mostly psychological or psycho-social realities. The term is used, e.g., as a technical word in Psychology, for the experimental settings, when the Experimenter is “manipulating the (dependent) variables” – see, e.g., English and English (1958). It was probably the meaning specially aimed at the first draft (revised in the printed text) of the brief introduction to the 2nd Circular of the 8th. ISAPL International Congress, April 2005, by J. M. Poersch. Interestingly enough, the outstanding *Vocabulaire de la Psychologie*, edited by Henri Piéron (1967) does not include this term.

But especially I will point out the meaning which is of direct interest to PL, and the one which is dominant nowadays. It is to be found very sporadically, briefly mentioned in more ancient Dictionaries of the ‘60-s and even Larousse 1967 evokes it as “Fig.”, and only for the verb *manipuler*, “manoeuvre destiné à tromper – manipulation électorale”. On the contrary, in English I found such a sense only as referred to the verb: “manage or use unscrupulously; alter fraudulously” (The Penguin English Dictionary, 1964); or : “control or change especially by artful or unfair means so as to achieve a desired end” (The Merriam-Webster, 1964). The situation changed completely: this latter sense is the most used nowadays.

2. I find it mostly important for present and future PL and especially for research in this science, to clarify this basic meaning of MANIPULATION.

2.1 In several of my studies, devoted to Manipulation, published in the ’90s and the beginning of this Millennium (SLAMA-CAZACU 1993, 1997, 2000, 2005 etc.), I defined the term and the reality it covers, as: The action of influencing, mostly by communicational stratagems, an individual or a social group, in order to induce

some ideas, to create behaviors in them, not taking into account that this effect maybe is against their own interests, but always having the interest of the manipulator in mind – and without an awareness of the manipulated persons concerning these negative actions and their effects upon them. (SLAMA-CAZACU, 2000, pp. 37-42). I warned about some erroneous ideas concerning the essential features of this sense of Manipulation, namely that sometimes it is considered to be just an “influence” for obtaining a certain benefit for the manipulator.

(I heard, on Romanian Broadcasting, July 30, 2007, in Advertising for courses delivered to people who want to “manipulate their boss” in order to get a better room, a higher position or salary etc., pointing out that a “moral limit” to this influence is just “supposed to be respected” by the employee. Such an action of influence wasn’t called “Negotiation”- a term which could define the position of both parts –, but, I am repeating, a “Manipulation”). The so-called auto-imposed limits of such “influences” are relative and submitted to subjectivity. Therefore, I stress that a clean-cut definition for Manipulation properly speaking must be proposed and respected, and if using this term, one should follow a rigid sense, with no compromise (there are enough other terms – and realities – to be focused on, and by that avoiding dangerous confusions). I precise that Manipulation shouldn’t be confused with “Persuasion”, which implies creating convictions by conscious, reasonable ways, without offending the personal identity; or with “Argumentation”, an action for influencing via logical judgments for supporting the ideas and for creating conscious convictions that are not against the individual’s interest. True manipulation implies: a) an intentional action, from “outside”, upon a person or a group; b) the low level of awareness of the latter concerning a possible malign effect; c) the effect generally unfavourable to the person submitted to manipulation, and d) the effect always propitious for the manipulator. In any language there are colloquial, popular, or even argotic words that may evoke the same sense or parts of it, though not exactly this influential malign action upon someone, e.g., in English, fraud, slyness, trick, bluff, hoax etc., psychologically categories of lying behaviors (ibid., pp. 39-40).

2.2 The “Langue de bois” (for which I proposed in English as a corresponding syntagm “The Wooden language” (see SLAMA-CAZACU, 2000), a kind of “Newspeak”, (see ORWELL, 1945) is a way of Manipulation too (see, in the Romanian Dictatorship the slogans of Ceausescu, “The Golden Epoch” – for a country suffering from “ Fear, Starving, Cold” at home, etc., or the titles given to Elena Ceausescu, “Academician, Scientist of Worldwide Fame”, meant to manipulate a whole country by presenting her (politically imposed as “The Second Bureau”), as an outstanding scientist, while she was, in fact, almost illiterate. Manipulation can find some Ways of action, which may constitute a large area of study, research and criticism for PL (by which I intend both the so-called, in the topic of this Congress, “Science and Technology”, and to which I will briefly come back). Such “Ways” may be found in Political Discourses (mostly acting by “Communicational stratagems” – cf.

Slama-Cazacu, 2000 –, that I sharply differentiate from “Strategies”, due to their trickery background) (anybody may find examples in anyone’s own country). To add Advertising (on Radio, TV, Press, Posters), and just one example only: enormous Advertising campaign was done in the beginning of the New Millennium, 2000, for a medicine called Vioxx – while, in 2006, it was suddenly announced that it had “lethal effects” and even the Producer, announcing this fact, was also warning against the 4 millions pills still on the Market. A very well known French Company of Cosmetics confessed that, in the Advertising for its “Mascara”, the famous American glamorous Star had... “false eyelashes”, while it was also said that the product had a “telescopic effect” which lengthened the eyelashes by 60%. A much diffused slogan is that “Yahoo offers e-mails services without paying anything (in Romanian: *gratis*)”. In reality, it is necessary to pay a “Provider”, and also, while sending the messages suddenly some promotion is done by Yahoo, as an image appears influencing subliminally too.

Another “Way” is the Sounding of Public Opinion (for Elections e.g.). Studies were done, which revealed the Manipulation e.g. via the manner of formulating the “Questions”, or e.g. by the diffusion, before the end of the Elections, of the presumed results, in favor of a certain Party or Person. Manipulations are also done via actions of Intoxication, by launching “Rumors” (e.g. by the “Securitate” –, the Political Police in Romania during the Communist Dictatorship: an example only, by mentioning rumors, in 1977, to discredit a famous and courageous Romanian Dissident, Paul Goma – the same for the Czeck Vaclav Havel –, by diffusing the malign rumor that he was acting as himself a “Securist”, or as being a writer “with no talent” – while his books were published by famous Publishers as Gallimard, Suhrkamp, etc.). Just enumerating some other possible Ways, there are so many instances where Manipulation may also be exerted, such as Talk-shows on TV Reports, in Newspapers, many times in Tabloids, and Advertisements. I should also add some incorrect understanding of the chain causes-effects – perhaps due to the lack of enough competence – in the Experimental actions in a research in Psychology or even in Psycholinguistics in this area – but by far more dangerous and not rare, even in frequently-, unfair settings of Psychotherapy (done without the necessary competence and professional ethics, with the only aim of getting much money via manipulation based on the patient’s credulity). An extreme case is that of Hypnosis, done as a malpraxis, sometimes without minimal control from a legal outsider, with possible unconscious intervention on the psychological but also on the somatic facets of the person submitted to such uncontrolled influence.

3. Why did I decide to give this contents, aims and style to my Address here and now? Because these are topical matters in this “Modern World” and as a consequence I have devoted much of my research in the last two decades to them, and therefore I can support them with evidence obtained by personal research (namely, on Manipulation, “Wooden Language”/Langue de bois, some malpraxis too in the Mass Media, in Politics, in Social actions, in the domain of scientific – professional Social Sciences such as Psychology, Sociology, perhaps even Psycholinguistics, if not overseen). I

consequently decided to evoke these problems for Psycholinguistics, and to warn Psycholinguists and especially our Colleagues in the ISAPL and obviously in this Congress in general.

3.1 On the one hand, I would like to raise more interest in Psycholinguists, now and in the future, for such fascinating topics worthy of research, as, among others, MANIPULATION and its train of similar procedures or techniques, and the possible Ways of its action. These are not only species specific topics for PL, but also obviously of a vital importance for the life of Mankind in the “Modern” Context. It is not necessary to dwell more on this, as clearly alluded above to their backgrounds.

3.2 On the other hand, I intended to clarify here some possible misunderstandings, dangerous in ovo for our Science and for the Researchers in PL and their human Subjects.

It is known, that in 1982 the ISAPL was created (cf. also Slama-Cazacu, 2000), as the immediate agreement of a previous Project, presented by – chronologically enumerating – myself and Renzo Titone (to whom I would like to dedicate a homage in this moment of the 8th Congress). It was the first, and has remained the only International Association in PL. We both agreed to call it “Applied PL”, in order to put a stress upon the fact that it was meant to look to Human reality as such (usually called “Practical Reality” – in fact, to “Life” generally – and by that to separate ISAPL and Psycholinguistics generally from a trend still in fashion in those years, the “Generativism”, disconnected from “Reality” (the true Human Context, which is species specific psychosocial and conscious), where we come across Acts of communication, with processes of Learning a language, with Dialogue, with real Facts of language that are involved in Social interaction, etc. We by no means intended to create a gap between “Fundamental Research” and “Applied Research” (cf. also Slama-Cazacu, 1984), or to separate “a Psycholinguistics” as a “Science” and “a Psycholinguistics” as a “Technique” (to quote exactly from the Introduction to Circular 2, 2005, *ISAPL Bulletin*, p. 4: “when intentionally (in a conscious or in an automatic way) people use the message for influencing, for causing changes in the psychological status of speakers/hearers, or readers/writers, in an experimental way”). Without extending too much these comments, I consider it was a lack of attention in writing this peremptory sentence, without any explanations. I feel it necessary to stress the idea that, in an “experimental” setting, hence in scientific research, no researcher – not even a beginner probably – has the right to really “changing” the Subjects’ status – except if we speak about Psychotherapy, or such Methods in Psychopathology, in order to improve (but even in such cases, with much caution) a Subject’s mental or affective status. I will put a stress on another main idea. First of all, PL, in its hypostasis as fundamental research or as an applied one, has, among its fundamental Methods, the “Experimental” one (the same as in classical “Experimental Psychology”, and I personally have done a lot of experiments, e.g. the “verbal-associative experiment”,

or on the perception of verbal and nonverbal stimuli, on Dialogues etc.). This doesn't mean "influencing" in the proper sense meant above (2.) etc., or doing malign actions upon the Subject. I have to stress that it was never in the mind of the founders of ISAPL to separate Psycholinguistics as a "Science" and as a "Technology" (or Technique, or "Art", in any case not clearly delineated as such. And in any case, not to involve psycholinguistic research in some ambiguous actions, and not in "Experiments" in that confusing sense, of a "Technology" for Manipulating people. Even if not meant in what I quoted above, any confusion has to be avoided. The clear cut deontological actions have to be, from the very beginning of a research, expressed in a proper way.

Psycholinguistics is a Science, and in our Modern World it cannot be done without Research. And Research cannot be complete excluding "Experiments", but the latter cannot be conceived as a *manoeuvre* only for effecting changes in a malign way. To continue the stressing to better understand what is "Manipulation", on the one hand, and, on the other hand, this apparent separation (never meant by us) of PL as a "Science" and as a "Technique" (or "Art"?), let me say explicitly that, when founding ISAPL, we never meant to separate "Theory" and "Practice". Mentioning "Application" in the name of ISAPL was meant to underline a certain necessary separation from the Chomskyan PL at that time, which didn't envisage a view towards (Practical) Reality. "Application", "Technique", "Art" (?) have to be connected with (a certain) Theory, and "Theory" has to be strongly connected, for us, with Reality, with real life, with the final validation by contact with the so-called "Practice", or Application" (or, in other words, maybe, with "Art", or "Technology" etc. and vice-versa). Let us not play with Words, with not well defined Words! No gap therefore, between what, in a somewhat confusing way, would be called "PL as a Science" and "as a Technique" (or "Art"?). If having in mind also the dangers of "Manipulation", let us have a clear view of what is "Psycholinguistics", in its Scientific bases inter-related with Research, with Applications, with Practical aspects, on the strong relations, in PL, between "Science" and (a so-called) "Technology" or "Technique", and a PL where "Science" means a Domain that includes Research – with the Experimental Method as a serious basis, and a Research not separated from Reality, from real Life (be it called "Practical life", or not – but does it still exist as a mere "Contemplation" in our Lives?). Therefore, "Application to (practical) life" is, for us, implicit, and "Research starting from Reality comes back to (help) Reality (cf. also Slama-Cazacu, 1984). On the other hand, an "Applicative Research" (or "Technology", "Art" etc.) would only be a low-level research or study, and even without any real value unless it is not based on a "Scientific Background", and even on a sound Theory (verified by application to Reality). Therefore, Science is strictly involved (and vice-versa) in "Research", in "Application" (and other "Words"), in (well intended) "Experiment" (or in a so-called and well understood "Technique").

August – November, 2007 (revised December 2007, therefore briefly commenting the Proceedings of the 7th ISAPL Congress).

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Applied psycholinguistics goals: Priorities

1. Deep changes

Since the creation of the International Society of Applied Psycholinguistics in Milan, on Nov. 2, 1982, twenty five years ago, the world has experienced deep changes in the field of mass communication. The new scenario is the accelerated globalization and the virtual contact between interlocutors using Internet. The fusion of audio, video and telephonic communication is an example of the technologic and scientific revolution which causes labor relations problems controlled by those who possess knowledge and who innovate science and technology.

Despite the dissemination of internet communication all over the world, and the fact that very young children are familiar with its use, which apparently should mean the democratization of knowledge, this is not the case, since we are faced with the paradoxical situation where a minority of people master specialized knowledge while the majority is deprived of access to it and even of their civil rights: “According to the most recent UIS data, there are an estimated 774 million illiterate adults in the world, about 64% of whom are women” (UNESCO Institute for Statistics, 2007). In addition, even in many countries where elementary schooling is compulsory, the number of functional illiterates is increasing: those people are practically unable to attain their personal, social and civil realization.

2. Functional Literacy and Illiteracy

Among many definitions of functional illiteracy, we may choose the one given by Scliar-Cabral (2004): “The concept of functional illiterate therefore must be anchored on other criteria, namely, on the lack of reading and writing competence to overcome the social demands of daily life.” This definition, which is complementary to UNESCO’s definition of literate (2007), covers also the systems not predominantly alphabetic:

A person is functionally literate who can engage in all those activities in which literacy is required for effective function of his or her group and community and also for enabling him or her to continue to use reading, writing and calculation for his or her own and the community’s development.

According to PISA’s¹ definition that “Reading literacy is understanding, using and reflecting on written texts, in order to achieve one’s goals, to develop one’s knowledge and potential and to participate in society” (OCDE, 2003), the figures about functional

illiterates are alarming, even among developed countries like the United States and the United Kingdom (it must be pointed out that among these countries, the figures are larger among immigrants, including those of the second generation).

UNESCO's Literacy Assessment and Monitoring Program (LAMP, 2005) develops surveys to measure a spectrum of literacy levels that matches the needs and technical competence of literacy data users at all levels of understanding. LAMP asserts that "one of the key concepts involved in the acquisition of literacy is the need to achieve a high level of automatic (sight) reading as a basis for higher-order skills" (UNESCO Institute for Statistics, 2005 p. 3).

The spectrum of literacy levels is distributed as follows:

Level 1 indicates persons with very poor skills, where the individual may, for example, be unable to determine the correct amount of medicine to give a child from information printed on a package.

Level 2 respondents can deal only with material that is simple, clearly laid out, and in which the tasks involved are not too complex. It denotes a weak level of skill, but more hidden than Level 1. It identifies people who can read, but test poorly. They may have developed copying skills to manage everyday literacy demands, but their low level of proficiency makes it difficult for them to face novel demands, such as learning new job skills.

Level 3 is considered a suitable minimum for coping with the demands of everyday life and work in a complex, advanced society. It denotes roughly the skill level required for successful secondary school completion and college entry. Like higher levels, it requires the ability to integrate several sources of information and solve more complex problems.

Levels 4 and 5 describe respondents who demonstrate command of higher-order information processing skills (UNESCO Institute for Statistics, 2005 p.4).

Applying these concepts and classifications to data obtained from home surveys, the situation concerning reading and writing competence is alarming.

3. Alarming data

There is a high correlation between human development index (HDI), adult literacy rate and combined gross enrollment ratio for primary, secondary and tertiary schools, if you observe the classification given by the United Nations Development Program Report (2006): the five highest ranked countries are Norway, Iceland, Australia, Ireland and Sweden (with the exception of Australia, all of them in Europe), while the lowest are Nigeria, Rwanda, Eritrea, Senegal and Gambia (all of them in Africa).

Among the 31 countries examined by OCDE (2005 edition), Finland (548.2 points) presented the best mean score on the scientific literacy scale, followed by Japan (547.6) while Mexico (the only Latin American country) occupied the worst position (404.9 points). Confirming Finland scores, in 2003, only 0.3% of girls were identified as very poor readers at age 15.

Nevertheless, attending school and even finishing elementary school do not guarantee that the person can understand, use and reflect on written texts, in order to achieve her/ his goals, to develop her/his knowledge and potential and to participate in society.

The UK government's Department for Education reported in 2006 that 47% of school children left school at age 16 without having achieved a basic level in functional mathematics, and 42% failed to achieve a basic level in functional English (*Education Guardian*, 2007). Every year 100,000 pupils leave school functionally illiterate, in the UK.

Even though the literacy rate may be high, it does not say anything about functional illiteracy. For instance, "While the literacy rate in the United States of America is very high (99%)" ... "new statistics says that at present there are about 30 million functionally illiterate people in the USA and the numbers are growing." (*Civilliberties*, 2007).

In Brazil, the situation of functional illiteracy continues to be very worrying: according to the 5th edition of INAF (National Institute of Functional Alphabetism), the most important agency on the subject on the country, "only 26% of Brazilians from 15 to 64 years old completely master reading and writing in Brazil" (author's translation).

It is necessary to find out the causes of this problem, to call upon all the adequate specialists, including applied psycholinguists to solve it.

One of the strategies may be looking at the measures adopted by institutions in places where figures of functional illiterates were very high to bring them down.

4. The program Early Intervention Initiative (EII)

We will focus on the program Early Intervention Initiative (EII), initially developed by the Scottish Executive Education Department in 1997 and implemented by the West Dunbartonshire Council (*West Dunbartonshire Council*, 2007). Last June, they received the prestigious award given by the *Municipal Journal* for the best achievement in the field of children's care in the UK.

The program started in 1997 with a goal to be met in ten years: eradicating pupils' functional illiterates. The assistance of the psychologist Tommy MacKay was fundamental. In 1997, only 5% of primary school children obtained "very high" scores on word reading; under the benefits of the program, in 2007, the figure went up to 45%. The reversion of the problem may also be seen in the fact that in 1997 11% of children at the second grade of primary school presented low scores, while in 2007 the figure went down to 1%. In 2001, before the Program could show its effect on students entering the secondary school, one among three of those students (28%) was a functional illiterate: after attending seven years of primary school, her/his level was equivalent to a child nine and a half years old. In August 2005, as a result of from the program, only 6% of those students were still functional illiterates, a figure that the Early Intervention Initiative eliminated by November 2007.

Because of a lack of time, we will summarize the main factors that guide the program: developing language awareness at pre-school through synthetic phonics and the multi-sensorial approach, with pedagogical material based on research (*Jolly Phonics*); 10-strand intervention activities, featuring a team of specially trained teachers; continuous assessment and monitoring; extra time for reading in the curriculum; home support for parents and care-givers and the fostering of a “literacy environment” in the community (*Education Guardian*, 2007).

Since the program began, 30.903 students were tested individually, 29.906 in groups, totalling 60.809 students. Children who do not attain satisfactory levels in learning reading, writing and mathematics are accompanied individually through the program *Toe By Toe* by specialists till they can overcome their difficulties.

It must be emphasized the policy of the Council administration which had invested in the project, of eradicating functional illiteracy in ten years, more precisely, by November 2007, asked specialists as consultants to help it. As already mentioned, the project considered the family and community involvement important and much work was done for supplying the so called hidden curriculum.

The effectiveness of such policy in eradicating the functional illiteracy in the UK is confirmed by Her Majesty’s Chief Inspector, Christine Gilbert’s comments in the annual report (Gilbert, 2007, p. 2):

The final report, published in 2006, drew attention to the fundamental importance of developing children’s spoken language. It also made a number of key recommendations for schools, about teaching phonics. In particular, it recommended that systematic phonic work should be taught discretely; in other words, teachers should allocate regular time each day to make sure that children acquire the knowledge, skills and understanding to enable them to decode (to read) and encode (to write/spell) print. It also recommended that high quality phonic work should be the prime approach in teaching children how to read, so that they could move swiftly from ‘learning to read’ to ‘reading to learn’.

5. Reflections about the program Early Intervention Initiative (EII)

The repercussions of the program Early Intervention Initiative (EII) may be inferred by the fact that “A number of other schools have requested information on the project and some clusters of primary schools have decided to adopt the approach. The project director spoke at an international conference on Language Awareness in Schools in Le Mans in July 2006 and also at the Association for Language Learning Conference in Oxford in March 2007” (ASCL, 2006).

Since many projects for developing literacy showed such poor results, one of the first tendencies is copying without any reflection or adaptation to different scenarios what worked so well in other places. It is evident that some measures are indisputable, like the policy will of asking for the help of specialists in the learning-teaching of reading and writing to advise pre and primary school educators as well as the respective

pedagogical material writers. Only countries whose priority was education, preparing their teachers and adopting materials and methods based on up-to-day scientific research obtained satisfactory results in reading and writing abilities.

This implies the presence not only of highly specialized educators and psychologists, but also of linguists, psycholinguists and speech therapists, who will take care of the curricula reformulation, of the long term staff education, of the classroom activities, of the pedagogical material and of the remediation of students who have difficulties in learning reading and writing.

Teachers' comprehension of the scientific fundaments of phonics, for example, will inhibit the mechanic and inadequate exercises ministrations, which would imply in the inverse effect to the desired one. Indeed, the primordial reason of phonics is that the basic unit of the alphabetic systems, namely, the graphemes (constituted by one or more letters), represent one phoneme (sound classes whose function is to contrast meanings). Nevertheless, this goes against the individual's perception of the speech chain before being alphabetized, since the speech chain is perceived as a continuum and this is the main obstacle in learning reading and writing in the alphabetic systems. Therefore, a systematic work must be carried out to help the learner in her/his efforts to rebuild in a conscious way her/his perception of the speech chain for dismembering the syllable into its constituents.

It must be emphasized that not only the phonemes but also their written representation, the graphemes are units that contrast meanings. Ignoring that either the oral language or the written one is a semiotic system is ignoring that they serve as vehicles of our thoughts.

Another risk caused by the lack of phonetics knowledge among people who teach phonics is believing that it is possible to hear or to produce an isolated consonant [-continuous], i. é, a plosive. Indeed, there is an impossibility to articulate such sounds, if they are not embedded inside a precedent or subsequent vocalic sound, since it is necessary to break down the obstacle (signaled by silence), to allow the perception of any signal. In Portuguese there are six plosive phonemes: /b/, /p/, /t/, /d/, /k/ and /g/.

Another theoretical issue is ignoring that decoding must not be learnt by the names that letters carry, but by their **values**, many times conditioned by context. This mistake is particularly serious in Portuguese, for example, with the following graphemes: "c", "g", "h", "m", "n", "q", "s", "x", "z" and all the graphemes that represent vowels, but the principle is also true for all the graphemes. Evidently, the word "bola" should not be read as "beóélia" as would be the case if the names of the respective letters were to be used!

Finally, I would like to stress that besides the issues referring to the pre and elementary school and to how teachers must be trained, the lexical, semantic and specialized universes explosion by virtue of the fast scientific and technological revolutions determined the creation of real linguistic ghettos, impermeable even to those considered good readers. The consequence is the knowledge fragmentation and the impossibility of understanding the various cognitive universes: the humanistic ideal becomes day

by day more distant. Maybe, one of the venues should be preparing a new type of professional, able to translate the specialized text into something understandable by the majority of readers, a task that has already been partially done by the scientific journalist.

5. Final remarks

In this keynote address, my aim was to discuss the priorities for Applied Psycholinguistics:

I selected the topic of the fight against illiteracy in its different levels, namely, functional illiteracy.

I presented some statistics related to developed countries, like the USA and the UK and also mentioned Brazil, with high figures of functional illiteracy. I mentioned the program Early Intervention Initiative (EII) developed by the West Dunbartonshire Council, whose good results inspire other countries to apply similar measures, but being careful to adapt them to their respective scenarios, with a reflexive criticism.

The preferred areas where Applied Psycholinguistics may play a role are: the reformulation of curricula, of activities in the classroom, of pedagogical material, of assessment and remediation of students who have difficulties in learning reading and writing and also continuously training the teachers involved in the process.

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The art and science of transcribing aphasic (and other) speech

1. Introduction

Transcribing video or audio data of any category of speakers – normal adult native speakers, aphasic speakers, first language learners, second language learners – is a complex process, and how it should be done depends crucially on how the transcribed materials are to be used. There is no one right way to do it (although there are some wrong ones), which means that no transcription can replace the source recording. But video can be difficult to share, and sometimes impossible if there are privacy restrictions protecting one or more of the speakers; some privacy restrictions apply to audio recordings as well. Also, most types of analysis depend on having some kind of written record of what was said; without a record to refer to, we cannot evaluate the details of syntax, vocabulary, phonology, or broad phonetics, although observation-to-checklist methods that do not use transcripts can effectively capture some aspects of language behavior (ARMSTRONG *et al.*, 2007; MARIE, 2008), and direct analysis of the sound wave with a program such as PRAAT (www.fon.hum.uva.nl/praat/) is the only way to capture fine phonetic details. So transcriptions remain necessary; how can we make them as good as possible? Transcribing unavoidably puts a kind of filter between the recording and the reader of the transcription. (And the recording is already a filtered version of the speaker, because the recording selects a very small sample of the patient's behavior, and usually it is not natural behavior.) We can think of the transcriber's skill, and the notation(s) used, as determining the transparency of that filter. As transcribers, we try to keep this filter as transparent as possible – that is, to transmit as much information as possible, with as little bias as possible. The most obvious criterion for being transparent is being accurate, but there are other aspects of the transcribing process that are less obvious until you have had a certain amount of experience both as a transcriber and as a user of transcriptions made by other people. Consistency in notation is important, and so is completeness: this is a trickier matter than one might think, and we will take it up as we go along. The challenge of dealing with these 'other aspects' is what makes transcription an art; this paper is about that art.

2. Selecting the transcriber's goals

When one considers the amount of information contained in just the audio speech signal, one realizes how much richer it is than any transcription. From listening to

how people speak – especially the pitch (fundamental frequency) of their voices and the timing of how they respond to one another, listeners learn about their moods, their attitudes towards each other, their difficulties in creating their replies, their dialect background, their approximate ages, their educational background, and much more. A transcription would totally overwhelm its readers if it were loaded with all of that information in raw form, as if it were a set of minutely detailed stage directions for actors. Yet as we abstract away from that kind of ‘non-linguistic’ detail, we also remove the readers of the transcript from getting a sense of the speakers as real people. This tends to de-humanize the speakers and to make them merely ‘subjects’, which may undermine some of one’s goals in presenting their data.

Video data are even richer than audio, and video can be essential to understanding the speakers’ interactions and meaning: Do they welcome each other’s contributions to the conversation? What do their words *this* and *that* refer to – in other words, what are they pointing out or gazing at? Are the speakers using the right words for what they mean, or are they saying *left* when they mean *right*, *girl* when they mean *boy*? But a full audio-video transcript is terribly slow reading, and of course even slower to create. Furthermore, one’s presumed goal as a transcriber of everything-at-once – re-creating the video without showing it – cannot be achieved, because the transcription would overwhelm the reader with information; there would be too much to process.

If we accept the fact that our transcriptions cannot replace our recordings, it becomes clear that we must choose carefully what to put in a transcription and what to leave out. We should not just grab what we can and set it down, because our readers will not know what part of what we have written they can trust to be accurate and complete, and what parts they should assume are approximate and sketchy. For each transcript, then, we transcribers must decide what to focus on. However, we can convey multiple aspects of a speaker’s behavior; the way to do that is to use several parallel transcriptions that cover the same speech event, each transcript having a different focus.

There are two major considerations in deciding what levels to focus on; the first is what specific point(s) about the language or the interaction one intends to communicate, and the second is one’s intended audience and one’s general goals. For example, the specific point might be how the grammatical class of a word affects its pronunciation by learners or people with a particular aphasia syndrome, or that one particular syntactic construction is preceded by more hesitation phenomena than some other construction in certain groups of speakers, or that a particular L2 teaching method improves pronunciation but not syntax, or that one interaction pattern is more helpful to people with aphasia than another.

The transcriber’s focus for a given transcription is often expressed in terms of the linguistic level(s) of transcription – that is, the linguistic level or levels that will be rendered with the most detail, even at the cost of obscuring some other level. We’ll give

some examples below that show why this cost can be quite high, which is part of why two or more parallel transcriptions may be necessary. Some of the levels at which you choose to transcribe a speaker to analyze his or her skill level or the quality of his or her interactions with conversation partners might be phonetic (IPA-level), morphemic (or, for translations into another language, interlinear morphemic), conversation-analytic (showing hesitations, false starts, etc., and also gaze and gesture in interaction), prosodic (giving pitch contours and timing), or any of these plus relevant error analysis and/or error correction.

For an aphasiologist, the audiences/goals might be:

- Making or supporting a clinical diagnosis of the aphasia syndrome for clinical records
- Documenting changes in a patient's speech over varying conditions, such as
 - what they are talking about
 - whom they are talking to
 - when the recording is being made – for example, before and after a particular course of speech/language therapy
- Explaining the kind of aphasia to the family or to a general audience
- Sharing the data in a classroom or lecture presentation, highlighting particular aspects of it
- Publishing the data in a research journal
- Sharing the transcript in a research data base

Note that if the transcription is to be used by researchers outside one's own group – and it's a shame not to share good data – then it needs to be in a standard, machine-searchable format, the leading one being the CHAT format developed by the Child Language Data Exchange System (CHILDES) at Carnegie-Mellon University, which is used for many other types of speakers besides first-language learners, including bilingual speakers and people with aphasia.

For a first or second language acquisition researcher, the goals might be similar:

- Documenting changes in a learner's speech over varying conditions, such as
 - what they are talking about
 - whom they are talking to
 - when the recording is being made – for example, at different ages, or before and after a particular course of instruction
- Explaining the nature of language development to the family or to a general audience
- Sharing the data in a classroom or lecture presentation, highlighting particular aspects of it
- Publishing the data in a research journal
- Sharing the transcript in a research data base

3. Comparing transcription types

The best survey of transcription methods and purposes available is Müller (2008), except that this book omits mention of the Child Language Data Exchange System. CHILDES is of central importance to child language research because it enables not only international data sharing, but also computation of great numbers of useful statistics. (Fortunately, the CHAT handbook, as well as explanation of what one can do with their database is easily downloaded from <http://childes.psy.cmu.edu/>. CHAT has recently been expanded to include aphasia error codes, for the associated AphasiaBank project; some of these could be useful for L2 work.)

I have based my treatment of the topic here on my own clinical and research experience, but there is considerable overlap between my listing and the types of transcription covered in Müller's book (2006). Before going further, it will be useful to formalize a terminological distinction: if a type of transcription has all its information at a particular linguistic level (phonetic, phonemic, morphemic, syntactic), I will describe it as a transcription at that level, but if it uses a mixture of linguistic levels, I will describe it as being a transcription in a certain *style* or *format*.

I will survey, in varying amounts of detail, the following types of transcription: impressionistic transcription style, segmental-level phonetic transcription, segmental phonetic transcription style with word breaks and glosses, word-level orthographic (secretarial) transcription, morpheme-level transcription (including interlinear morphemic translation), conversation-analytic transcription style, and CHAT format transcription.

4. Impressionistic transcription style

In spite of what I have said about the unwieldiness or impossibility of putting all the different kinds of information into a single transcript, transcribers often find it easiest to start by writing down 'everything'. Creating a rich impressionistic transcription is often worth doing as the first step in deciding which of the systematic levels will be best for showing what is interesting about the speakers. This step also might lead one to decide that none of the standard levels is appropriate, and that one should create a specialized one to bring out the particular properties of the data. An impressionistic transcription uses standard spelling supplemented with some kind of phonetic information when necessary, including information about hesitations, mispronunciations, and false starts, plus notes about gesture and gaze. The transcription might also include notes about unclear words or word endings, and alternative interpretations of unclear words and morphemes. The impressionistic transcription will generally be able to serve as basis for the word-level orthographic and the morphemic transcriptions, but for all the other types, it will not have enough information; the transcriber would have to go back to the original tapes and add more.

Here is an example, from current work by a Colorado research team led by my colleague Gail Ramsberger (GR). Our late collaborator BYR, in this longitudinal study of her increasingly severe (progressive) aphasia (see Filley *et al.*, 2006), was retelling the story of how she met her husband, and GR was the interviewer.

Example 1: Impressionistic transcription

BYR: Mm. I was – was a [=ei] stewardess-/ɛs/ of uh Hong Kong – Air...
ware..

BYR: and and uh w – w – weh /wənt/ uh from Manila to Hong – Hong Hong
(Hong Kong) and uh uh

BYR: uh He was on a on a uh /e/ /e/ (air – air)

BYR: [winces, apparently at her own difficulties] the the the

BYR: w- M-mos’a the time be- before we h:ad /f-fi/-fill, um, the the /p/ – the
the air, the – [closes eyes, raises both hands]

GR: = the plane?

BYR: the p-plane [chuckles at having had problem with this very familiar
word]

5. Word-level orthographic (secretarial) transcriptions

Many of the transcriptions that are available are essentially word-level orthographic transcriptions; that is, they are renditions of the words that the transcriber heard, using the standard writing system for whatever language is being spoken. This is the easiest kind of transcription to make; an undergraduate assistant can do it if the speaker is easy to understand, and if the speaker has near-standard pronunciation, morphology, and syntax, word-level orthographic transcriptions provide reasonably good data for many of the types of questions that researchers are interested in – for example, vocabulary size, sentence length, and syntactic structures used by the speakers. But obviously, word-level transcripts can’t give information about such other matters that may interest a particular audience, such as intonation contour, elision of sounds in frequently used phrases such as I think or you know, hesitation, mispronunciation, or timing of speech overlap when one talker starts a turn while another is still speaking. Some word-level orthographic transcriptions maintain the speakers’ hesitations and repetitions; others clean them up, making the speakers look as good as possible. The example here retains repetitions and false starts, but for that information to be reliable, all of the repetitions and false starts need to be transcribed. If it is too difficult to transcribe them all, then none of them should be given, because the reader will have no way to know what percentage and what types have been omitted. This is an example of the completeness problem that I mentioned above.

Example 2: Word-level orthographic (secretarial) transcription (repetitions retained)

BYR: Mm. I was a stewardess of Hong Kong Airware, and and went from Manila to Hong – Hong Kong; and he was on a on a air – air the the the... Most of the time before we had fill the the p- the the air, the

GR: the plane?

BYR: the plane.

6. Segmental phonetic transcription style with word breaks and glosses

When the speaker being studied is not much like the idealized normal speaker of a well-known variety of the language, word-level transcriptions pose an opaque filter between the recording and the reader. For young children, aphasic people with pronunciation problems, or L2 learners, there may be questions about what word they are trying to say. In a phrase that should contain unstressed function words, such as the preposition and article in *in the house* or the Portuguese clitic pronoun *me* in *Dê-me alguns* ‘Give me some’, it may be quite difficult to tell whether these grammatical morphemes were really intended by the speakers, or whether they are just putting in a sound that will make their utterance sound approximately like their impression of the target phrase as a whole (JOHNSON, 2000; PETERS, 1977; PETERS & MENN, 1993) e.g. [ɪˈhæws] for *in the house*. For tracing morphosyntactic development or deficiency, therefore, we need an IPA-level segmental phonetic transcription. But as reading a segmental phonetic transcription and understanding it is quite difficult, the transcriber also needs to impose word breaks and offer glosses that specify the intended word(s) – which will often be guesses. To keep the filter as transparent as possible in cases like this, the transcriber must do more than transcribe; she or he must also annotate the transcription, letting the reader know which glosses are only guesses, and which grammatical morphemes may not really have been present. Intonation markings may be added. The resulting style, a mix of segmental phonetic and morpheme or word levels, is very useful when the speaker’s articulation or heavy use of non-words is a focus of the paper or presentation, but it is excessive for long passages or for papers whose focus is above this level of detail. Rather than illustrate it separately, I will go on to its close relative, word-level transcription style with phonetic annotation, which uses the same techniques but reverses the proportions of the orthographic and phonetic levels.

7. Word-level transcription style with phonetic annotation

In this style, most words are transcribed orthographically, but words whose pronunciation is at issue, unidentifiable strings of sounds, and ambiguous morphemes are presented in IPA. Our speaker BYR was immersed in British standard (RP) English as a schoolgirl; her first language was the Chinese spoken in Shanghai, usually called

Shanghainese, but English had been her dominant language for about fifty years, and at least to a Yankee ear, there was no Chinese quality to her English. Here is a sample using IPA for words whose segments are important.

Example 3: Word-level transcription style with phonetic annotation.

BYR: Mm. I was was /ei 'stuə dəsəs/ (a stewardess) of /ə/ Hong Kong /'e: we:/ ('airware'; error for 'airways').

In a mixed-level transcription style like this, there is an unspoken but critical assumption: unless otherwise noted, the pronunciation of all the words that are not in IPA will be reconstructable by the reader. This means that the dialect and/or accent of the speaker must be identified, in case details about pronunciation are important. And if the audience might not know the dialect, or might forget important things about it, IPA should be given. As mentioned above, BYR spoke British RP English, learned in school as an early second language. A British reader would not need more information than this to see that the error word /'e: we:/, which I have glossed 'airware' is very close to the target 'airways', but a reader who speaks North American English needs the IPA to see the resemblance. This error may involve several psycholinguistic processes and levels, and a full analysis would be too long for this paper, but analysis is not even possible unless sufficient information is given about phonology, morphology, and lexicon.

What are the reasons for the other uses of IPA in this sentence? The /ei/ is worth writing out, because using /ei/ instead of /ə/ for the definite article suggests (though not definitively) a slight hesitation before word 'stewardess', a word that must have been extremely familiar to BYR but which had become hard for her to produce. And any mispronounced word must be written out, hence /ei 'stuə dəsəs/. In this particular example, if the word is left in conventional orthography, the transcriber must either decide that it is singular (following the grammar and the sense) or plural (choosing the English word nearest to the actual pronunciation). In IPA, however, we can see that BYR had doubled the final /əs/ syllable; that tells us that she had a phonological error, rather than a morphological error of adding a plural /əz/. This distinction is important because if we do not have accurate information about the linguistic level of an error, we cannot create a psycholinguistic model of the speaker's aphasia. The same kind of reasoning of course applies to other groups of speakers: this would also be the kind of information needed to determine whether a student needs help with pronunciation or with grammar.

Finally, the /ə/ before 'Hong Kong' is given in IPA because it is impossible to tell, even on repeated listening to the recording, whether this is a hesitation sound 'uh' or a misplaced indefinite article 'a' before the proper noun 'Hong Kong'. I think that it is a hesitation, since throughout her transcripts BYR had many clear hesitations and no unambiguous article insertion errors, but the readers of the transcription should be given this information, rather than having the transcriber make the decision, if the matter is at all relevant to understanding the speaker's language problems. Here again,

completeness is at issue; the reader of your transcription needs to be able to trust that if you have not given an IPA rendition of a word, then it was pronounced the way a normal speaker of your speaker's dialect would have said it.

8. Morpheme-level transcription

A morphemic or morpheme-level transcription identifies all the morphemes used by the speakers. The transcriber is necessarily imposing a much heavier filter between the data and the reader in creating a morpheme-level transcription, so one of the types of transcription that we have already discussed is usually presented in parallel with it. Vertical alignment is used to make clear which label goes with which word. Here is an example:

Example 4: Morpheme-level transcription (with morpheme labels).

BYR: Mm. I was a stewardess of Hong Kong *Airware

Filler 1SG.PRO COP 1/3SG.PAST art INDEF.SG N prep Nproper

*error: substitution of ware for ways

Morpheme-level transcriptions like this are useful for investigating issues such as the kinds of grammatical morphemes that a speaker can use correctly or the ratio of content words to function words in his or her speech; they are also the appropriate basis for assessing the syntactic structures that the speaker has used. The conventions for abbreviating morphological terms like pronoun, article, and copula are more-or-less standardized, and are exemplified in the same sources as are cited for interlinear morphemic translations, below. A different format for the same information, designed for computer searching and counting, is specified in the CHAT format of the Child Language Data Exchange System; more about that below.

In making morpheme-level transcriptions, there are three often-difficult kinds of problems to think about: how to label a morph when it might represent several different morphemes (morpheme homonymy), whether successive words are intended as part of the same construction or just part of the same utterance (identifying constructions), and whether and how to reconstruct missing morphemes (morpheme restoration).

Morpheme homonymy

One must be careful to note all (or most) of the possible morphemes that a string of phonemes might mean, unless the actual spoken context really determines the interpretation. For example, in English, one simply may not know the person and number of an isolated regular verb form without an ending – it could be an infinitive or any person and number except 3rd singular. Similarly, in French, the *-er* verb infinitive form written *parler* ‘to speak’ in standard orthography is homonymous with its past participle, written *parlé(e)* ‘spoken’. If the form /parle/ is produced without sufficient

adjacent spoken context to determine its target form, the reader of the transcription needs to know that a speaker – especially a speaker who is likely to make errors – might have had several forms in mind, and that this form should not be counted as a fully-identified infinitive.

Identifying constructions

A morpheme-level transcription introduces another issue that may be very serious: whether the words that are produced in a sequence are in fact in a syntactic relationship with one another, or more like a list enumerating different aspects of a situation, or whether, as is very common, they include broken-off constructions and constructions with missing pieces. Consider the following excerpt from another aphasic person's narrative (Mr. 'Eastman', Menn 1990, p. 168):

Example 5: Mr. Eastman, morpheme-level
The man wakens... the clock.

Is this a 'reversal error'? That is, did Mr. Eastman intend to create a passive sentence ('The man is awakened by the alarm clock') and fail because he cannot find the appropriate passive verb morphology? Or equivalently, but from a different perspective, did he mean to say 'The clock wakens the man', but have trouble slotting the correct noun into the subject and object positions? Or was Mr. Eastman not attempting a construction involving two nouns, but rather giving us a simple intransitive sentence 'The man wakens' and then the noun phrase 'the clock', without any overall way of integrating the two? We really can't be sure – the timing suggests the latter, which in turn suggests a more serious syntactic deficit – or perhaps the timing indicates self-monitoring, with Mr. Eastman realizing that what he has already said is not repairable without re-starting the sentence. But a morphemic transcription requires a choice; either 'the clock' is the object of the verb 'wakens' or it isn't. The careful transcriber will think about such problems and add notes to indicate them.

Morpheme restoration

The problem of whether and how to restore missing words and grammatical morphemes is really another aspect of the problem of identifying constructions.

When the transcriber is dealing with an utterance like Mr. Eastman's above, which cannot be repaired by adding a few missing words, the usual decision is not to try to repair it at all. But, consider this utterance, as Mr. Eastman tells of the events surrounding his stroke (MENN, 1990, p. 166):

Example 6: Mr. Eastman, impressionistic style
'Rosa' and I, and – friends – of mine... uh... uh... shore, uh, drink, talk, pass out.

For the purpose of tallying the kinds and percentages of missing morphemes, I reconstructed this, according to Mr. Eastman's word order and the general context, as follows (MENN, 1990, p. 169):

Example 7: Mr. Eastman, morpheme-level

'Rosa' and I, and – friends – of mine [were at the] shore.

[I was] drink[ing and] talk[ing, and then I] pass[ed] out.

However, many other target utterances would have made sense, and it is quite possible that Mr. Eastman actually had no complete well-formed target in mind. Morpheme restoration gives a false sense of there having been such a target, and the more a speaker's language deviates from normal, the less reason we have to trust such restorations. The same problem, of course, appears in first language and early-stage second language usage. So morpheme restoration is a way to make explicit what the aphasic or beginning speaker would need to know in order to sound like a normal speaker, and it helps the reader follow the speaker's meaning if the transcriber has done a good job, but it is not a good way to identify the speaker's actual target. That remains unknowable.

9. Interlinear morphemic translation

An important variant of the morphemic-level transcription is the interlinear morphemic translation, which uses a set of standard abbreviations for the grammatical morphemes, and filters out hesitations, mispronunciations, repetitions, false starts, and so on. Interlinear morphemic translations with standard glosses are essential for cross-linguistic work. The standard for interlinear morphemic translation is Lehmann (1982), elaborated for aphasia by the CLAS participants and used throughout the group's publications, including Menn & Obler (1990) and the 1996 special issue of the journal *Aphasiology* (vol. 10 (6)) on cross-linguistic comparison, as well as many other publications.

Here is an example from an article on agrammatic aphasia in Farsi (NILIPOUR, 2000).

Example 8: Interlinear morphemic translation

1. sar[-am]
2. man [be] dast [va] sar xombâre [xor-d]
3. I [to] hand [and] head[-my] shrapnel [hit:PAST:3SG]
4. I hand, head shrapnel.

The first line contains error corrections, if the speaker's target word or word-form can be identified – in this case, a missing possessive suffix is restored. The second line is a morpheme-by-morpheme version of what the speaker said, with missing words

reconstructed in square brackets, and with hesitations and mispronunciations edited out unless the intended morpheme is ambiguous. Line 3 gives a literal rendition into the language of the intended audience, with standardized abbreviations for grammatical categories such as number, gender, and tense. If the translation of a grammatical morpheme into the audience's language gives unambiguous grammatical information – for example the words 'I' and 'my' in Line 3 – then the grammatical labels like SG.PRO or 1SG.POSS do not have to be given explicitly.

Line 4 is an impressionistic translation – one might think of it as a poetic one, because while it is as literal as possible, it also attempts to re-create the impression of the quality of the original speaker's language. For example, if the original language does not require or does not have articles (e.g. Russian, Chinese, Japanese), they are supplied in Line 4 when translating into a language that does require them (e.g. the Romance and Germanic languages), because the speaker did not commit an error of omitting articles.

A problem arises when an error is untranslatable – for example, giving the effect of a gender error in a Romance language when translating into a language that does not use grammatical gender, such as English, Chinese, or Japanese. Various solutions to this problem have been created; one way is to introduce an error into Line 4 that seems to the translator to be about as serious, but was not present in the original. One must always explain to the audience that only Line 3 is to be trusted as a source of grammatical information; Line 4 is an effort to re-create the qualitative effect that the speaker's use language would have had on a hearer.

Notes of explanation are added after each set of four lines, as needed. And of course the three general caveats that I mentioned in the section on morphemic translation – the problems of morpheme homonymy, identifying constructions, and morpheme restoration – apply to interlinear morphemic translations as well.

10. Conversation-analytic transcription

If the goal is to understand the dynamics of a conversational interaction – for example, to see whether an unskilled or disabled speaker is soliciting and getting appropriate support from a more language-competent conversation partner – a very different type of transcription is necessary: a conversation-analytic (CA) transcription, which makes it easy to see such key events as interruptions, overlap between speakers, the intake breath that signals that a person is about to speak, the vocal signals that indicate whether a speaker intends to relinquish or maintain his/her turn, facial expressions, gaze, posture changes, and gestures. Such transcripts can be very helpful in coaching families of people with communication difficulties to be better conversation partners. A wonderful source for seeing the value of such transcriptions, and for looking at various styles of CA transcription for particular purposes is C. Goodwin's 2003 book *Conversation and Brain Damage*; see also Damico et al. (1999), Damico and Simmons-Mackie (2003), and the final chapter of Lesser and Milroy's

1993 *Linguistics and Aphasia*. The CABank project linked to CHILDES adds CA symbols to the CHAT format.

Let's look at another conversation (recorded a few months earlier than the one we have been using so far) with our collaborator BYR. Her husband AR was helping her to tell the story (BYR died in 2008, and AR in 2009). We'll begin with a word-level transcription, so that you can understand the content she is trying to convey, and then look at a conversation-analytic transcription, which highlights the interaction between the couple. Note that although I am including the type of information conveyed in a CA transcript, I am not using CA standard symbols; it would take much time to introduce them, and my point here is just to demonstrate the value of this kind of information for understanding interaction – in the present case, between speakers of differing skill levels, due to the aphasia of one of them. BYR's aphasia, by the way, was quite unusual: it was a primary progressive aphasia. This means that it was not due to ('secondary to') a stroke or other brain lesion, and that it was getting worse over time. It was also an unusual variety of primary progressive aphasia, because its main impact, as far as the listener is concerned, was on word form production, with much hesitation between words and stammering at the beginnings of words. As in many other aphasias, however, the main problem initially reported by the speaker, who was highly educated, multilingual, and formerly very skilled as an artist and executive secretary in addition to her years as a stewardess, was her anomia – that is, her difficulty in coming up with the words that she needed to express her meaning.

Example 9 presents the entire conversation in word-level orthographic transcription, to give the context; Example 10 presents some of the points in the conversation where AR takes a turn, so that we can see in detail just how he finds the right places to contribute. We will see from Example 10 that what look in Example 9 like interruptions turn out to be something quite different.

Example 9: Word-level orthographic (secretarial) transcription, BYR's repetitions and phonological errors removed (for comparison with Example 10)

LM: Could you tell again, the story of how you met your husband? I always love this story.

BYR: Oh, I was a teacher; by the time, after six years, and a friend of mine the, who worked with some airway, and she said, "Oh, there is a new air-ware company and they're looking for stewardess." I said "Oh, ok, let me try it, if it's have [?] fun, because they had, in those days, they have, a age, limiting.

AR: She would just – she was teaching in a Catholic school, head music teacher in Hong Kong, wasn't meeting any men, that was it, that was it, – she, and she was a good-looking chick, you know, so...

LM: I've seen pictures!

BYR: I remember I said – "I came – I'll always just go back to teach later." So I flew about two and a half, and I met him – from Manila to Hong Kong.

And in usually, we had a full load, you know, we – in – you work, you don't have time to talk, and that – the day he came only four passengers – the – we had time to talk.

AR: It was a one hour and forty-five minute flight, from Manila to Hong Kong, and so we had a chance to talk.

BYR: Mhm! That's how we met.

(Addressing their pet dog, who is next to her) That right? That was good.

LM: And was that – but then he was just, but that was just one flight. How did you meet again? You didn't fall in love on just one conversation, did you?

BYR: Yeah, he was living in Tokyo. And so when we, I used – we flew to Tokyo, Taiwan, Philippians),

AR: Seoul.

BYR: Seoul, so we would –

AR: I was Far East manager of my publishing company, n' so we would meet in different places.

BYR: So

AR: And I was attracted to her because she drove her brother's Morris Minor in Hong Kong on the wrong side of the road, at a high rate of speed...

LM: In Hong Kong, up and down

AR: ...with 'er Chinese slit skirt right up there. God! I mean, I said, this is wonderful!

LM: You must have felt like you were in a James Bond movie, except that they hadn't been invented in those days.

AR: Right! Right.

BYR: Ah.

LM: So...

AR: And in those days, she talked up a storm.

BYR: yeah...

In Example 10, I give a CA-style transcription of four sections of this conversation, although I am omitting one important element, the duration of the pauses. The first section is intended to give a sense of BYR's production in a monologue section, and the others show the points at which AR takes a turn in the narrative. The beginnings of AR's turns are marked with *.

There is one in each of Sections 2 and 3, and three in Section 4; those three are numbered for ease of reference.

Example 10: Conversation-analytic (CA) style transcription of sections of conversation, but without elapsed-time measures or special CA notation.

(Note: because AR was not visible in the video, there is no information about his gaze and gestures)

[LM re-positions self on left side of sofa to look directly at BYR and keeps looking at her unless noted; AR is just off-camera in an armchair to the right of BYR's sofa and a little closer to the camera.]

Section 1

LM: Um, could you tell again, the story of how you met your husband?
I always love this story.

2:30

BYR: oh, I was a, a, I was a, a, teacher /twə/
[turns head & gaze away from LM; hands are in her lap]
b-by the time, a-after s-six y-years, and
[turns head and gaze back to LM]
[LM nods slightly]
a friend of mine the, who wor-works-worked um uh, worked – worked
rom air-air-air air-way,

3:07 [turns head partway towards LM, glances at LM; LM nods;
turns gaze away from LM again]

Section 2

BYR: because they h-have-had, i-in-in those days,
[gazes at LM]

BYR: they have, have a , a, uh, uh,
[RH gesture, hand extended, horizontal movement, center to R and
return]
age ([eidʃ]), limiting.
[gesture, hand extended and flat, moves slightly downward, possibly
indicating 'lid']
[Drops hand and gaze, LM nods]

3:47

*AR: (Clears throat) She would ju = – she was teaching
[BYR turns head to look at AR, opens mouth a little and raises eyebrows;
LM also looks at AR]

Section 3

BYR: th-that

[starts pointing to AR but is looking down]

d- the day he (in? came?)

[shifts gaze back to LM]

only-only four

[shows 4 fingers; LM nods]

passen z z – t

[LM nods again]

so so

[briefly raises hands to shoulder height, moves them apart;
indicating increase of time?]

he-the-the –

[turns head to LM, who nods]

we had t-time to to talk.

[R hand chest height, held vertical, indicating AR as part of ‘we’]

5:00

[laughs, drops hands so that right hand slaps her knee]

*AR: It was uh a one hour and forty-five minute flight, from Manila to –
Hong Kong,

[BYR looks at AR, keeps smiling broadly, turns head more towards
him]

[BYR keeps looking and smiling at AR]

[LM nods, looking at AR]

AR: an’ so we had a chance to talk

[BYR turns head back towards LM and looks at her,
then down at dog, which she pets.]

Section 4 (three turns initiated by AR)

BYR: <Y-yeah, he w- uh, -he>

[starts answer without looking at LM or AR]

he um he was uh, w- uh l-living in- Tokyo.

[BYR looks at LM, who nods;

looks away again and raises R hand as she resumes talking]

and uh so when we, I u-

[BYR looks at LM, tilting raised R hand towards AR; LM nods again]

used – w-we flew t-to

[moves index finger back and forth in horizontal plane,
suggesting flying back and forth]

- Tokyo, Taiwan
[lowers right hand each time she names a destination]
uh Phili – uh –
[BYR closes eyes, then turns head towards AR,
moving her fingers in front of her mouth as if trying to evoke a name]
- *1AR: Seoul.
BYR: [open eyes, looks at AR]
S-seoul,
[nods slightly to AR, looks back at LM, then away]
so we-we
[looks directly at LM]
would –
[gestures back & forth towards AR, laughs, still looking at LM],
we, um,
[turns and looks at AR, smiles, lifts R hand]
- *2AR: I was
BYR lets hand drop onto her lap, head still turned towards AR;
LM also looks at AR; LM also looks at AR]
Far East manager of my publishing company, n' so we would meet in
different places.
[short pause; BYR continues smiling, turns to look at dog, whom
she is petting.]
- BYR: So
6:15 [pause continues]
LM: [nods, looks back at BYR, who is smiling; LM pets the dog's head
with L hand]
- 6:17
*3AR: And I was attracted to her
[LM looks up at AR, stops petting dog;
BYR lifts head turns gaze from dog to AR]
because she drove her brother's
BYR turns head towards AR, starts to smile slowly during his next
several words]
Morris Minor in Hong Kong on the wrong side of the road, at a high rate
of <speed>...
[LM starts to laugh, tosses head up]
[BYR smiles]

What the CA transcription enables us to see and document is the nature of the interaction between BYR and AR. How well-timed is the help he gives her? Is it wanted or unwanted? It is clear, in fact, that this is as fine an interaction as one could

imagine, this is a Fre-Astaire-and-Ginger-Rogers-quality duet. BYR's smiles and laughter alone tell us that she thinks AR is doing a good job of collaborating with her on telling this story, but the transcript documents more than that. Look at each turn that AR takes, and remember that he knows this story as well as BYR does and that he could easily interrupt her and dominate the telling. Yet each time he takes a turn, either BYR has signaled full completion of her utterance, is failing to initiate a turn, or has actually looked at him to signal that she would like his help. In Section 2, BYR has dropped her hand and gaze, indicating that she has finished her turn; in Section 3, she drops her hand even more emphatically. On his first turn in Section 4, BYR's hand gesture and head turn tell AR that she needs help in finding the next repeating it (notice that she gives no phonetic hint of the word she wants; she is relying on their mutual knowledge). Cueing AR's second turn in Section 4, BYR turns to him; he takes his third turn *only* after a long-continued pause, finally adding information from his own point of view, as a participant in their joint love story.

The interaction contrasts impressively with many in the literature, notably those cited as examples of poor interactions in Lesser and Milroy (1993), where the non-aphasic partner offers either too little help or too much, but without the information provided in a CA-style transcription, it would not be possible to see the fact.

11. CHAT-format transcription

Standardization of format is sometimes unpleasant to deal with, but it is critical if computers are to be used to compare data across many speakers and languages, as in the Child Language Exchange System and AphasiaBank. As I mentioned, CHAT format information is easily found online at <http://childes.psy.cmu.edu/>, so I will just present a sample and give a short explanation of why the format is worth using. *The CHAT manual* itself is much more than a manual. It also gives a history of child language data analysis, a thorough discussion of many more issues concerning transcription than I have been able to cover here, and much useful background data – is short, it is very much worth reading the introductory sections even if one has no intention of using the system oneself. Example 11 gives a sample of the basic level of CHAT coding.

Although the format seems forbiddingly encrusted with complicated symbols, the reward for transcriptions is substantial: after a transcript has been put into CHAT format, one can use the CHILDES suite of analysis programs (CLAN) to analyse the data in many ways. And best of all, the associated TalkBank <http://talkbank.org/> makes it possible to link transcripts with audio or video data, so that the transcripts becomes, in effect, an immensely powerful index to the original data.

Example 11: basic CHAT coding, from CHAT manual downloaded from childes.psy.cmu.edu/manuals/chat.pdf on 4 August 2009, p. 21

@Begin

@Languages: eng

@Participants: CHI Ross Child, FAT Brian Father
 @ID: eng|macwhinney|CHI|2;10.10|||Target_Child||
 @ID: eng|macwhinney|FAT|35;2|||Target_Child||
 *CHI: why isn't mommy coming?
 %com: mother usually picks Ross up around 4 PM
 *FAT: don't worry.
 *FAT: she will be here soon.
 *CHI: good.

The lines of speech, rendered orthographically, are marked with * so that a CLAN program knows which ones they are: @ identifies information about the file and the participants, so that a CLAN program can pick out, say, all the conversations between parents and children when the children are between the ages of 2 years 6 months and 3 years in order to compare them with some other set of conversations. Background information relevant to understanding each line is marked with %. Importantly, the transcript can optionally be expanded by adding more %-marked lines (called 'dependent tiers', for example, a tier giving morphological information using CHAT standard notation, as in Example 12:

Example 12: Main and morpheme tiers, from CHJAT manual downloaded from childes.psy.cmu.edu/manuals/chat.pdf/ on 4 August 2009, p. 81

*MAR: I wanted a toy.
 %mor: PRO|1S V|want-PAST DET|a&INDEF N|toy.

Consistent of this standard notation, which is explained in the CHAT manual, makes it possible to search for, say, the presence of 1st person singular pronouns in multiple transcripts simultaneously, even across multiple languages.

12. Conclusions

Transcription is never free of problems, and original recordings should never be discarded if there is any legal way to keep them. But choosing (or if necessary, creating) a type of transcription appropriate to one's materials, research purposes, and audience can yield important benefits, first in giving one better ways to analyze one's own data, and second in making it easier to demonstrate one's conclusions, rather than merely claiming them. Substantial communities of transcribers of different types of speakers are to be found through CHILDES and its associated user groups, and these user groups provide informal support for people who are just beginning to refine their transcribing skills. Transcribing is slow and sometimes discouraging, but it is worth doing and doing well; it is one of the arts that helps to make linguistics a science.

Acknowledgments. This paper was originally presented as an invited workshop at the ISAPL 8th International Congress, using video data as well as these transcriptions of the video-recorded material. Additional written materials were developed in interaction with the audience there and with students in a short course on transcribing and analyzing aphasic speech that I taught at Abo Akademi University in Turku/Abo, Finland, in October 2008, and in consultation with my Colorado colleague Barbara Fox. My thanks to my colleague Bruce Kawin for editorial help to the workshop participants in Porto Alegre and the students in Finland, and to the colleagues who made my visit to both places possible and rewarding.

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Applied psycholinguistics as critical discourse analysis: The case of media-ethic dilemmas

1. Introduction

Psycholinguistics (PL) is more than “the scientific study of the psychological processes involved in producing, understanding, and remembering language” (HARLEY, 1995, p. 28) The propulsory role of psycholinguistic knowledge may be recognized as “the social activity of making meanings with language and other symbolic systems in some particular kind of situation or setting” (LEMKE, 1995, p. 6). As a consequence, since the outline of Applied PL may be framed in discourse as “a form of life” (MININNI, 2003a), it changes in time as and when it has to cope with new problems.

The cultural asset of the human mind is shaped by the organization of beliefs and preferences into a wide range of situational formats which change within the history of communities. In the post-modern era people are plunged into the web of social communication and exposed to the confrontation with the issues of bio-politics and bio-ethics through the opportunities and the bounds of media. The pervasive presence of the media within human experience implies the continuous passing through the discursive spheres, so that the process of meaning production takes resources from different logical and rhetorical procedures. Thus linguistic communities often have to cope with “media-ethic dilemmas” (MININNI; MANUTI, 2008). The present conditions of human existence push the “moral I” to often live situations where “the growing gap between what makes us (indirectly) aware and what we could (directly) influence brings the uncertainty that characterizes each moral choice to unprecedented heights” (BAUMAN, 2003, p. 134). Most of the situations where it’s difficult to take a moral decision deal with the body within the threshold phases of existence (birth and death) or to specific turning points within the story of people.

Such situations push the inner dialogue of personal conscience into a vertex of conflicting positions. In this sense, the dilemmas are dialogical bends which activate specific rhetorical resources. Post-modern sensibility has pointed out new reasons for revitalizing the “*Homo rhetoricus*” (HAMMERSLEY, 2003, p. 772). The rhetorical analysis enhanced by discursive psychology (HARRÉ; GILLET, 1994) aims at highlighting the interactive, dialectical and situated nature of meaning production. People are recognizable as such through what they do within the specific contexts of meeting, where they engage themselves (with different degrees of consciousness) to make sense of their experience. The rhetorical assets, that defines “how” are as

relevant as the conceptual (propositional and semantic) assets which marks “what”. The situated interaction could be interpreted as a discursive matrix inspired by the double bound of affirming the self and welcoming the other. The intrinsic dialogicity to discourse consists in the fact “that the other cannot be eluded”, as the subject involved “is called to answer *to* the other and *for* the other.” The ‘I’ is constitutionally, structurally, dialogic in the sense that it testifies to the relation with the otherness, whether the otherness of others or the otherness of self” (PONZIO, 2006: 11). The emphasis on the dialogical nature of discourse as a sense-making practice shows the need for a “semio-ethics” to be developed (PETRILLI; PONZIO, 2005). Here I will show that the contribution of Applied psycholinguistics to this aim may be provided on three levels, namely if:

- the reference contexts within the process of text production are defined in terms of mediated **interaction**. Actually, the presence of the media shapes the “public discursive sphere” by transforming it into a regime of “quasi-interaction” often characterized by “para-social modalities”;
- the debated topics do refer to the “**private discursive sphere**”, since they recall positions which highlight personal identity, as for instance sexual preferences, religious options, etc.
- the generative horizon of positions is political in nature and refers to “unquestionable issues”, as notoriously are those posed by bioethics, which unavoidably engage human minds with **moral dilemma**.

Therefore, a special relevance has to be attributed to those complex and versatile technologies that allow the human communication practices, since they produce actual mass “Brain frames”, able to organize the collective experience about the real world through specific format of making sense.

2. Critical Discourse Analysis is more than psychology and linguistics and rhetorics and...

Applied psycholinguistics, as Critical Discourse Analysis could draw various and flexible tools just from semiotics, which investigates systems and processes of meaning (FABBRI, 1998) by intertwining the pragmatic and textual perspectives in the analysis of communication. Semiotics may help critical discursive psychology to engage adroitly by offering various and flexible tools such as, for instance, the “models” provided by the constructs of “text”, “enunciation”, “discourse sphere”, “narrativity”, “figurativeness”, and others. Thus, Critical Discourse Analysis proposed by applied psycholinguistics looks for meaning production not in what is regular, frequent, that can be generalized, but rather in what is anomalous, rare and idiosyncratic. It prefers to check its hypotheses on the “stone rejected by builders”.

In fact human communication is always shaped as a “**text**”, that is the whole of relations organized as a totality. Emphasis on “text” has a theoretical reason, since it allows us to validate the apparently suggestive hypothesis that “somehow, we don’t

have a language, *we are a language*” (VOLLI, 2004, p. 68, authors’). We are the texts we work through. Of course, textuality not only refers to verbal (spoken and written) language, but to any production of meanings, in any “substance” in which it happens. In order to carry out its intention of meaning, each text dialogues with its context (or “field of action”), in both production and reception. Text in itself is a structured whole of potential meanings that are actualized by a specific context of occurrence. Text is a “game of communicative action” (SCHMIDT, 1973) whose meaning comes out from the capacity of its enunciators to coordinate themselves in defining its Gestalt nature. The interpretation of signs/texts accomplishes the notion singled out by *the* Gestalt theory of “from-to” procedure, that is drawing the meaning of a “figure” going up from details to the whole and at the same time coming down “from global to particular”.

Semiotic investigation links the notion of text to that of **enunciation** as a way of activating meanings. Text and enunciation are both important in shaping the enunciating roles within sense negotiation. The text is like a mirror, since it shows who the enunciators are and how they act in it. Their presences are made opaque by the thickening of traces and clues and the intertwining of interpretative routes. Thus, investigating how texts reveal their potential enunciators is crucial. Indeed, the enunciator comes out of the pragmatic connection between text and context in a “semiosphere” (LOTMAN, 1984). The enunciator “does not precede the text: it is at most reconstructed on the basis of the whole procedures of the expression within the text itself. The enunciator is a result of the text: if it is its premise, it is a premise resulting from a rearrangement. It is a shadow, reflexively created by the textualization it provokes” (FABBRI, 1998, p. 102).

An useful tool of psychosemiotics analysis is the notion of “**discourse sphere**” (VOLLI, 2004, p. 82). It describes any practice of meaning production involving people as enunciators. The aspect of participation is crucial, not only because it implies both inclusion and exclusion strategies, which show the dynamics of power and responsibility in access to meaning, but mainly because it allows the attribution of an ethical value to the participation in a discourse.

The complex nature of the topics discussed here is confirmed by the evidence that the contributions to the debate are often characterized by the crossing of different discursive spheres. In fact arguments projects into:

- 1) a **juridical frame**: How should the State behave before such a request? Is there a right which needs to be recognized and protected? Does this right damage others’ rights? Should it be right to avoid any legislative intervention?
- 2) an **ethical frame**: What is right and what is wrong? What is the meaning of life?
- 3) a **religious frame**: Who is at the origin of life? Is life a gift? Should we believe in miracles? Should we acknowledge the authority of the Pope as to interpret such topics?

- 4) **medical frame:** deontological questions concerning the new ways of caring, limits of prolonged artificial life support, accurate technical definitions of terms like birth and death, palliative cures, euthanasia, disthanasia, biological will.

A very useful specification of the cultural constructive role played by language is given by the concept of “discursive sphere”. Actually, discourse – meant as “language *between* men” (VOLLI, 2004, p. 69) — acts within “very peculiar *spaces* of existence” (*ibidem*), which could be concrete (as for instance a class for the discursive sphere “education”) as well as abstract (as for instance a chat room for the discursive sphere of “virtual communication”). A discursive sphere allows us to frame the several types of relations which connect people with specific enunciating contexts. This very general notion reminds us that the relationship between people and their own discursive activities is circumscribable, since it could be thought as a space of enunciation of sense or a “universe of discourse”. The worlds created within the process of activation of sign systems are to be distinguished according to an unfinished list of coordinates, so that the discursive sphere could be “public *vs* private”, “open *vs* closed”, “focused on word *vs* focused on image”, “devoted to decision *vs* devoted to knowledge”, “serious *vs* entertaining”, and so on (VOLLI, 2004, p. 85).

3. The dialogical dynamics of texts

Buhler’s programme may be carried out through the notion of “diatext” (MININNI, 1992, p. 1999), which is inspired both by the dialectical dialogism pointed out by Bakhtin (1935, 1975) as the “natural tendency of any live discourse” and by the “dynamic-contextual method” proposed by Slama-Cazacu (1959). Each text makes the subjectivity of the enunciator appear through his/her acknowledgement of a particular context, with its bonds and opportunities. Briefly, “diatext” is a semiotic device to understand the context as it is perceived by the enunciators of the text, as they imagine it and show that they take it into account. In this, texts are diatexts, for two main reasons which are recalled by the same word ‘dia-text’ (from the Greek prefix ‘*dia*’, through). Actually, sense does not derive permanently within the texts, rather it goes through them as a result of the conjunct action of the enunciators, who negotiate the frame of the situation (*stake*) in which they are actively involved. As a consequence, a diatextual approach to the study of communicative phenomena aims to point out the Gestalt qualities of the interacting processes of sense-making.

The notion of diatext aims at making explicit the principle organizing the mutual links between “what is said by the text” and “what can be said through the text by those taking part in the dialogue”. The links take shape in three dimensions: “field”, “tenor”, and “mode”, that indicate topic, relational tone and style of the discursive event (HALLIDAY; HASAN, 1985). The guiding principles for the diatextual researcher are *dialogism*, *situationalism* and *holism* and all of them enhance the Gestalt nature of discourse. Though apparently evanescent, intangible, slippery, confused and

impressionistic, the “oversummativity effects” of a particular discursive practice are the most interesting ones for the diatextual approach. Obviously, the analyst may focus on some segment of the “corpus”. But his main interest is to enhance their contribution to the “spirit” of the text.

Such an holistic approach is sustainable if the researcher is aware of his own fallibility and partiality. The diatextual scholar is cautious, since he knows that at any time he can fall into the abyss of over-interpretation. Diatextual analysis draws on the assumption that the meaning of a discourse could be caught by answering to three basic questions: Who is saying that? Why does he/she say it? How does he/she says it? These questions have an ethno-methodological valence since first of all they guide the practices of comprehension of those who participate in the communicative event. To take part in a conversation (and/or to come into a dialogical relationship) means to grant such an enunciating contribution of sense, as to show who is speaking, what could legitimize what she/he is saying and what is its claim to validity. These questions organize the interpretative procedures of the “SAM Model” for a diatextual researcher, since they suggest that he/she looks for a series of markers which identify the *Subjectivity*, the *Argumentation* and the *Modality* of discourses and can thus catch the meaning within the dynamics of reciprocal co-construction of text and context of enunciation (see Fig. 1).

Questions of Diatextual Analysis	Dimensions of Diatextual Pregnancy	Diatextual Markers
1. Who is the utterer of the text?	Subjectivity	- Agentivity: any textual unit showing if the enunciator is source or goal of action; - Affectivity: any textual unit highlighting the emotional dimension of texts; - <i>Embrayage/debrayage</i>: any textual unit revealing whether the enunciator is involved or not.
2. Why the text organizes its world?	Argumentation	- Stake: aims and interests animating the text; - Story: scenes, characters, models of action; - Network: <i>logoi</i> and <i>antilogoi</i> activated within the several narrative and argumentative programmes
3. How the text is built?	Modality	- Genre: any reference to the typology of text and intertextual references; - Opacity: rhetorical figures, frame metaphors, etc. - Metadiscourse: any expressions of comment and reformulation.

Figure 1: An overview of the “SAM Model” to catch the Gestalt texture of discourse

The first question (*who says that?*) aims at clarifying the way the text speaks of its subjects, by weaving the complex links with the image the enunciator elaborates of him/her-self and of the addressee. The diatextual researcher looks for traces of the dialogue between the enunciating positions that (through the text) let the identity profile of the ideal author and of the ideal addressee come out. As in the famous pictures by Escher, where the flowers become progressively birds, the meanings that constitute a text let the figures of their enunciators come out.

The second question (*Why does he/she say that?*) points out an axis of semiotic pertinence which allows the discourse to articulate arguments, that is to organize “meanings why”, and to give voice to reasons and aims as to why one says what they says.

The third question (*how he/she says that?*) focuses on the articulation of the “*dictum*” and of the “*modus*” of discourse by which the meaning is shaped, that is it acquires a *Gestalt* quality which can be evaluated as “good” or “bad”, “nice” or “naughty”, “effective” or “insipid” etc.

Diatextual analysis is a proposal for a “subjective” interpretation, with the explicit awareness of the particular and the fallible nature of its results. The analysed text links the subjectivity of the researcher to the subjectivity of enunciators. The researcher expresses his/her subjectivity first into a series of options which are prior to the data analysis, starting from the definition of the object under analysis, to the collection and selection of the *corpus* and proceeding to focus on the pre-theoretical point of view (or ideological orientation) in which he/she seeks to penetrate the text. Subjectivity in the methodological practice of the diatextual researcher is also congruent with the aim of investigating the presence of other “subjective” voices within the corpus, that is, the identity positions that the text realizes for the interlocutors it meets. The text is like a mirror, since it shows who the enunciators are and how they act in it.

Here I will show only some of the procedures of the diatextual approach, namely those with a greater *Gestalt* pertinence and those with a greater rhetorical relevance. With “diatextual *Gestalt*” I mean those dialogical and dialectical dynamics working in the production and reception of a text within a specific context. The sense-making process can be traced back to the oppositions framed by the “semiotic square”, that is the “visual representation of the logic articulation of any ordinary semantic category” (GREIMAS; COURTÈS, 1979). The efficacy of such a model comes from its capacity to recall the human tendency of organizing meanings by contrast and/or opposition of differences (MININNI, 2003b). The “semiotic square” not only traces back the generation of possible meanings in a discursive sphere, it also, if considered as an “enunciating square”, allows one to enhance the pragmatic cues of the “architecture of subjectivity” (you-me) in the meaning production realized through the text. These markers are related to the two basic modes of text construction (*débrayage/embrayage*). If the enunciator adopts a strategy of *débrayage*, he produces a text lacking any anchoring to “I-here-now”, so that the global effect is that of an “objective sense”, since he shows unselfishness and normative generalization. On the contrary,

if the enunciator adopts a strategy of *embrayage*, then his text exploits any resource in order to link meanings to “I-here-now”, so that the final effect is of a personal involvement, since he takes himself into a regime of circumstantial legitimation and emotional guarantee.

4. Media-ethic dilemmas

Here I will attempt to give a contribution to the examination of the rhetorical strategies which are used when the dialogical “form of life” meets the enunciating practices of a dilemma. The case study is given by the argumentative context of a recent public debate broadcast by Italian media about the necessity both to abrogate a law on medically assisted fecundation and to promulgate a law on euthanasia.

The mass media are the most prolific means of information dissemination, a mediator between scientific and social knowledge (MININNI, 2004). This is the case of public campaigns concerning ethical issues and/or socially desirable behaviour, such as for instance organs donation and transplantation (MOLONEY; HALL; WALKER, 2005) and new foods (HOUTILAINEN; TUORILA, 2005) or genetically modified organisms (CASTRO; GOMES, 2005).

Here I will empirically check the hypothesis of a “diatextual Gestalt” by analyzing some discursive practices in the media about ethic dilemmas, concerning specifically both medically assisted fecundation and euthanasia. The “good form” of discursive positioning depends on the congruence between the self image attributable to the enunciator and his argumentative position in the debate about the dilemma.

The first object of the investigation is the process of *sense-making* which has engaged individuals on occasion of the referendum for the abrogation of law 40 on assisted fecundation. On the 12th and on the 13th of June 2005 Italians were asked to express their opinion on 4 questions about the different articles of a law which had been previously approved by the Parliament as to govern the bio-medical techniques aimed at promoting fecundation. The bio-ethical issues brought about by the law and by the consequent referendum engaged people in translating a political choice into a number of beliefs which have a dilemmatic origin. The special complexity of the SRs which will be investigated is linked to the process of production and diffusion which take place around the edges of different “discursive spheres” (VOLLI, 2005), that is those enunciating places where a regime of participation is determined, where the forms of authorization to the access are discussed and where the typologies of questionable issues are decided thus organizing and proposing “idiomatic scripts” (in terms of lexical and grammatical options as well as in terms of interaction styles). The diatexts of the biomedical issues show the role that some social representations play within a community, as they allow people to develop points of view on very complex questions and engage them to find agreement, although fully respecting different enunciative positions and value attributions.

The second object of the investigation comes from a few media texts (newspaper articles and contributions to a forum on the Internet) produced about the “Welby affair”. This expression refers to the public debate that burst out in Italy within three months, that is from 21 September 2006 (when Piergiorgio Welby, suffering from progressive muscular dystrophy, sent a letter to the President of the Republic in order to ask for an intervention of Parliament) to 21 December 2006 (when the news that a doctor had “unplugged” the artificial respirator which had been keeping him alive was broadcast). The “Welby affair” had a huge effect on public opinion since the popularity of Welby as co-chairman of the association “Luca Coscioni” (set up for the legal recognition of prolonged artificial life support and the right to ask for euthanasia) activated symbolic resources already available to the Italian discursive community. Moreover the argumentative context got politically overloaded as a new phase of the ancient fight between Guelfi e Ghibellini. In Italy the debate about euthanasia shows specific features coming from the confrontation between the catholic culture, which indeed can be considered as the default anchoring for public opinion about these issues and a laic approach, often in favour of euthanasia as in the case of the political activity of the *Partito Radicale*.

5. The diatext of medically assisted fecundation

The SRs of “medically assisted procreation”, here analysed through diatextual analysis, are shaped within a complex intrigue of discursive spheres. The discursive dimension of SRs has been investigated with reference to a very relevant Italian social issue that is the referendum campaign which has been carried out for the abrogation of Law 40 on assisted fecundation. Actually, this law has engendered heated debates pushing public opinion to reflect both on the limits of scientific research (as in the experimentation on stamen embryonic cells) as well as on the meaning of responsible and ethical behaviour (as in the issue of artificial fecundation). The special complexity of the social representations which are the object of analysis is linked to their being produced and diffused in a very uncertain format of “public opinion” at the interface of different “discursive spheres”.

The value of human life, the mystery of the biological origin of the life of man and the sacred root of existence (as a unique experience of the self) are all traits which will force people to frame the object of their ideological confrontation within a *private* (intimate) discursive sphere. The function of science, the support of technique and the obligation to self care are, on the other hand, coordinates which force people to put it within a *public* discursive sphere. The obligation to decide, the aspiration to the consent of the other and the will to overcome the other by any means makes it possible to meet and to discuss this issue in a *political* discursive sphere. The claim to show the essentiality and the exemplarity of the “human case” and the run up to the exceptional (or to what is unusual) are the main features of the discussion about assisted procreation which takes place within a *mediatic* discursive sphere.

The corpus of data is made up of a sample of texts published in the national press and collected within the weeks before the referendum which took place on the 12th and on 13th of June 2005 for the abrogation of Law 40 on medically assisted fecundation. The contra abrogation texts have been collected from *Famiglia Cristiana*, a very popular catholic weekly magazine, while the pro position texts have been collected from *L'Espresso*, a popular moderate left wing weekly magazine.

These texts are a very vivid example of a social communication campaign, aiming at constructing a totally different social representation of medically assisted fecundation. The debate about the referendum poses very relevant ethical and religious issues which have important personal and social implications.

Although the distinction between a pro abrogation position and an abstention position, the core of the representation of assisted fecundation is unique, what changes is the discursive construction, the interpretative repertoire, the lens through which the law is interpreted. Therefore, the analysis of the data reveals the use of *common rhetorical strategies*.

Both positions use popular and/or authoritative testimonials as to better establish the claim, to support their argument and to switch on one of the most famous weapon of persuasive communication that is social desirability (CIALDINI, 1984). In other words, the social relevance of the issue “imposes” the adoption of a position which is congruent with what is expected other people would do. Therefore, the opinion manifested by others which are perceived as trustworthy (the voice of experts) or as similar to the self (as for age, gender, experience, etc.), becomes a mean to orient the one’s own opinion. In this case, the pro-position is sponsored by Sabrina Ferilli, a very well-known Italian actress (the voice of women), and by Prof. Umberto Veronesi, a popular researcher and past minister of health (the voice of science).

On the other hand, during the referendum, the contra position was conducted by a special committee named “Science and Life – Allied for the future of man”, which also encompasses very popular personalities from the world of religion, politics, science and entertainment.

In both cases, the campaign is anchored to strategies which explicitly recall a personal positioning, since the arguments are constructed around the involvement of testimonials. Therefore, the *enjeu* of communication is constructed in terms of “identity”. The emphasis on identity manifests itself through the *embrayage* that is the explicit adoption of what is the enunciating reference to the “I” not only within the debate between opposomg slogans (“I do not vote” vs “I vote Yes”). Actually, these texts are argumentative in nature, since their aim is not only to inform the readers about some implications of the law but rather to convince the audience to actively take part in the debate by pragmatically manifesting their being pro or contra through vote or abstention. Being framed by what happens in political communication (CORTINI; MANUTI, 2002), the discussion about law 40 is discursively constructed around a dialectic of positions “we/they”, which entails an implicit categorization of what is to be considered good and what is judged as bad. In other words, the discussion is

framed within the script of the communicative battle, since each interlocutor depicts his/her position as the most convincing and rational as compared to those of the others, thus considering superfluous any further argument.

The argumentative lexicon is very rich and articulate. It is mostly characterized by meta-discourse indices (both textual and interpersonal) and argumentation auxiliaries (para-argumentative expressions and modalization). Meta-discourse is the whole of all non propositional aspects of discourse aimed at helping the readers to organize the content of communication coherently and to understand the author's point of view by giving him/her credibility (CRISMORE; MARKANNEN; STEFFENSON. 1993). More specifically, it could be distinguished into textual (i.e. logical connectives, frame markers, endophoric markers, evidentials, code glosses) and interpersonal (i.e. hedges, emphatics, attitude, person and relational markers). In this case, both corpora show the use of logical connectives (that is why), code glosses (for instance), attitude markers (I agree) and person markers (we). The para-argumentative expressions are those expressions whose aim is to show their own arguments as convincing and as self-evident as possible so that any further justification becomes superfluous.

The use of modalization (i.e. 'rightly', 'perhaps', 'certainly') is aimed at discursively reducing to a minority those who support a position which is contrary to one's own by intensifying or attenuating arguments. Nonetheless, one of the most evident contrasts between the pro and contra positions is to be found in the discursive option which exploits the argument "I was an embryo too". The possibility to let the "voice of the embryo" be heard could be differently framed within the discussion. Actually, the political frame of the referendum has lead Italian society and the media to question themselves about "the identity of the human embryo and about the consequent ethical attitude" (CODA, *Repubblica*, Jun. 13, 2005, p. 50¹). Therefore, the debate finds one of its highest vertex of dissonance in the interpretation of the ontological statute of the embryo: is it a "subject" or rather an "object", is it someone or is it something.

The pro-abrogation supporters define as "unheard" the claim to attribute to the embryo the characteristics of a person: the embryo is a form of life which cannot have a voice, since it does not own any enunciating modality of the self yet. On the other hand, the abstention front claims to speak on behalf of the embryo, arguing the necessity to listen to those who are not able to let their voice and project of life be heard.

The referendum and consequently the social participation in this issue has been thematized as a "battle for civilization" (BERSELLI, *Repubblica*, Jul. 10, 2005, p. 43²) or as "a defence of law" (Campaign against the referendum – Life &

¹ This is an extract of the interview published on *Repubblica*, one of the most important Italian newspapers, on Jun. 13, 2005. Together with the other quotations it is part of the analyzed corpus.

² Extract of the interview published on *Repubblica*, on Jul.10, 2005.

Science committee). On the one hand, there is the position of those who, although acknowledging that “from an individual point of view it is right to think about the embryo as a person (...), do not understand why these conceptions should be imposed on those who have different ideas”, according to Berselli (*op.cit.*). On the other hand, to not vote is the most responsible choice for those who are willing to oppose “a logic which is dangerous for all the human and moral fundamentals of our society” (RUINI, *Corriere della Sera*, May 5, 2005, p.3).

The ideology which inspired law 40 considers the embryo as human life, as a subject who has the same rights as those who have conceived it. The supporters of the abrogation highlight the “damages provoked by the metaphysics of the embryo” (RODOTÀ, *Repubblica* May 13, 2005, p. 49) and deny to it “the right to become a person”. The argumentation in juridical terms is based on the absolute lack of autonomy of the embryo: that the project of life cannot be compared with an individual (the unique and authentic bearer of rights), “because to become an individual the embryo needs to be welcomed into the body of a woman (...): its life depends on the acceptance another life manifests”, according to Rodotà (*op.cit.*).

The main inspiring motive of the abrogation position is to separate the interpretative repertoires of religion and science, of faith and politics. According to this position, it is necessary to distinguish the discursive sphere of biology, which attempts to catch the rhythms and the developmental procedures of embryos, from the discursive sphere of morality, which is oriented towards the philosophical theories and/or towards the religious beliefs, and is engaged to enlighten the conceptual value of human beings.

Therefore, although concerning a relevant public and social issue, this referendum has been framed and interpreted as a socio-political battle between the catholic world and the laic and progressive world.

The SR of medically assisted fecundation which emerges from the media texts is constructed around the pivots of law, scientific research, participation and civil rights. Nonetheless, although the thematic networks which embrace the representation of the issue are the same for both positions (pro and contra the abrogation) their discursive construction changes as the identity of the interlocutors change. The first example is the presentation of the object of discussion, that is, law 40 on assisted fecundation, which is described as unfair, cruel, medieval and unacceptable by the pro-abrogation supporters and as responsible and aware by those, who invite the abstention, explicitly condemning the referendum more than the law itself.

Actually, the interpretation of the referendum is different. It is meant as an instrument of democracy, a mean to express freedom and liberty, while its discursive construction given by the contra abrogation position aims at presenting it as the attempt to make banal a very serious ethic issue.

Another central theme is scientific research whose interpretation is ambivalent. For the abrogation position research is interpreted as progress while for the abstention position it means respect for life.

Similarly, the topic of research recalls the comparison with the other European countries as to the law on assisted fecundation. Therefore, for the abrogation position the referendum is an occasion to get in step with them while the abstention position highlights once more the importance of respecting human dignity.

Therefore, fecundation is also a very important discursive node, meant both as a gift and as a choice. This thematic nucleus is strictly linked to the different subculture which frames discourses, that is ethics and science. According to the abstention position, which interprets the debate about medically assisted fecundation as an ethical issue, fecundation is meant as a gift of life which has to be respected. Conversely, the pro-abrogation supporters argue their own position appealing to science and progress, thus interpreting fecundation as a way to affirm and manifest the self-determination of women. This aspect of the representation twists the role of women within the experience of fecundation: in the first case women are passive; that is they must undergo fecundation as it is a gift from God, differently from the pro-abrogation; women are active participants since they are allowed to choose and make decisions about their future.

In this light, the participation in the *referendum* acquires different shades of meaning. For the pro-abrogation position it is interpreted as a civil and active responsibility, while for the abstention position “to abstain is not a sin”.

Therefore, the analysis of the discursive construction of assisted fecundation reveals the existence of two different interpretative repertoires, which correspond to two subcultures: **science** vs **ethics**. On the one hand, the abrogation position interprets the referendum as an occasion to affirm a civil right and thus to actively take part in the life of the country, by manifesting one’s own opinion on the future of the country. Actually, the pivot of the discussion is science, which should be free from any religious and political conditioning since it is the engine of progress and development. Citizens have the right and duty to manifest this awareness through the vote. As a consequence the most representative discursive act which emerges from those texts is to “awaken and sensitize civic conscience” by inviting you to vote.

On the other hand, the abstention position constructs the question of assisted fecundation by discursively focusing on ethics. The object of discussion is presented as an unquestionable matter, since not everything which is scientifically possible is ethically legitimate. In this perspective, the referendum is presented as an inadequate and wrong instrument, because individuals cannot decide about such a complex and delicate question. Therefore, the most representative discursive act is to “boycott” the abrogation position by undermining its identity and by presenting its campaign as deceitful.

6. The diatext of euthanasia

The issue of euthanasia is interesting for applied psycholinguistics first of all for a lexical reason. In fact, even though from a medical-juridical point of view; euthanasia

could be considered as an “assisted suicide”— often used expression, related to the more recurring “assisted fecundation”—, generally the discursive asset avoids any association between euthanasia and suicide. Such an effort of lexical disengagement is clear in the German language, where, together with the words ‘*Selbstmord*’, ‘*Selbsttötung*’ e ‘*Suizid*’, we find the word ‘*Freitod*’ (free, voluntary death). All these words describe the action of “taking one’s life” in radically different ways. ‘*Selbstmord*’ occurs in the informal/colloquial register, evoking a morally negative judgement; ‘*Selbsttötung*’ e ‘*Suizid*’ occurs in the in legal/juridical and medical/ psychiatric contexts. On the contrary, ‘*Freitod*’ shows even positive connotations, since it hints at the personal responsibility of the choice. It involves an implicit condemnation of social convention and a hint at the overcoming of guilt and shame.

Starting from such premises the aim of the present contribution is to investigate how the media have presented and thus contributed to constructing rhetorically the public debate. So, as to better catch the inter-locutionary dimension of the discussion, the study has focused on two dedicated newsgroup discussions published on the web. Therefore, the corpus of data is made up of a sample of 331 e-mails collected from September to November 2006 within two different virtual forum present on the web related to the topic of euthanasia provoked by the Welby affair. The first is the forum of *Repubblica* (212 e-mail) and the other is the one published by *Azione Cattolica* (119 e-mails). This choice has been motivated by their different cultural orientation toward bio-ethic issues, the first being a progressive source while the second a declared catholic one, and thus by their supposed different discursive construction of the topic. The diatextual analysis of the data has shown some common strategies and some differences between the two corpora of e-mail.

The main question inspiring this study is: how media texts about euthanasia construct their enunciators? The psychological pertinence of such a question is also revealed by the fact that the empirical subjects of this issue—the terminally ill person, often called “human larva”—is generally presented as being “without voice”. Actually, a most recurring strategy adopted in the debate on euthanasia consists in focalising on language. Enunciators seem to pay high attention to it. “I want to say it clearly by now and ask for direct or indirect help” (TESTONI 2007: 56). Also when relatives and friends are talking, they report that “his words could no more be understandable” (TESTONI, 2007, p. 59) and they show themselves as being engaged in “giving back voice to patients” (TESTONI, p. 62).

Moreover the texts of evidence frequently use meta-discursive resources, like when, for instance, the enunciator reports that “writing these lines is upsetting me tremendously” (TESTONI, p. 68). There is the hope of activating the “mirror-neurons” in the interlocutor, as to gain his/her empathy.

There is the hope of activating the “mirror-neurons” in the interlocutor, as to gain his/her empathy.

The use of “diatextual power” is a common strategy in all the texts. In fact very often enunciators use communicative resources in order to define “how things should

be said". This means that "through the text" the enunciator is engaged in shaping the world (of meaning). The diatextual power appears in the stylistic register "not so... but".

The terminological explanation is a common strategy, in order to mark the feeling (or the hope) that difficulties in understanding each other depend only on confusion in words, so that just a lexical agreement should be sufficient to make opinions and beliefs converge. Thus in the media debate about euthanasia a lexical strategy is used, being the dialectic of different enunciating positions legitimized through the choice of different words.

An effective version of lexical strategy can be found in the enunciated "I'm against euthanasia, but I consider unfair the prolonging of artificial life support", used by many participants to the debate about the "Welby affair" when opening or closing their arguments.

The lexical distinction is a widespread resource used by those who, within an argumentative context, try to take an intermediate position between "opposite extremisms", which are implicitly considered wrong and are sources of negative effects. Generally the attentive choice of expressive resources is modelled on the rhetoric of the "happy medium". An important discursive resource used in the rhetorical construction of arguments is the qualitative description of death. Some recurring syntagms are: "sweet death", "good death", "natural death", "abject death", "horrible prolonged death", "peaceful death", "human death", "slow death", "early death".

The presentation of death shows the pathemic enhancement suggested by the enunciator for the end of life. The opposing meanings are constructed through the contrast between two structural components of passional performativity that are between the aspectual character and the hestestic character of affectivity (FABBRI, 1998, pp.39-42). While the "hated death" is depicted as filling time with its oppressive presence ("slow", "early", "prolonged"), the "beloved death", on the contrary, is described in its soft passing through body sensations ("sweet", "peaceful", "good"). Welby's choice overcomes such a contrast, since he asks for an "opportune death", meaning a well-timed, advisable death.

If we consider media texts as evidence in favour of or against the legalization of euthanasia, we can distinguish different enunciators, depending on whether the author speaks for himself or for a "third party." In the first case, the pathemic dimension is a textual resource that shapes an enunciator consistent with his argumentative position. The "ideological wills" left by those who managed to accomplish some kind of euthanasia are constructed through emotional *debrayage*. The text doesn't show the physical and psychological effects caused by the illness, because it aims to gain the *enjeu* not heading for the empathy for the suffering man, but on the claim of being reasonable in asking for a (not yet acknowledged) right. On the contrary, the ideological proclamations of those who, even being in extreme conditions, are against euthanasia, are constructed through emotional *embrayeurs*.

The whole discursive sphere of the public debate about euthanasia (as occurred in Italy in the “Welby affair”) can be framed in the “semiotic-enunciating square” based on the contrast between “dignity” and the “sacredness” both of life and death. Such a radical alternative implies a variation in the opposition in negative between “non sacredness” and “non dignity”, when the arguments refer, more or less explicitly, to some disclaimed aspect.

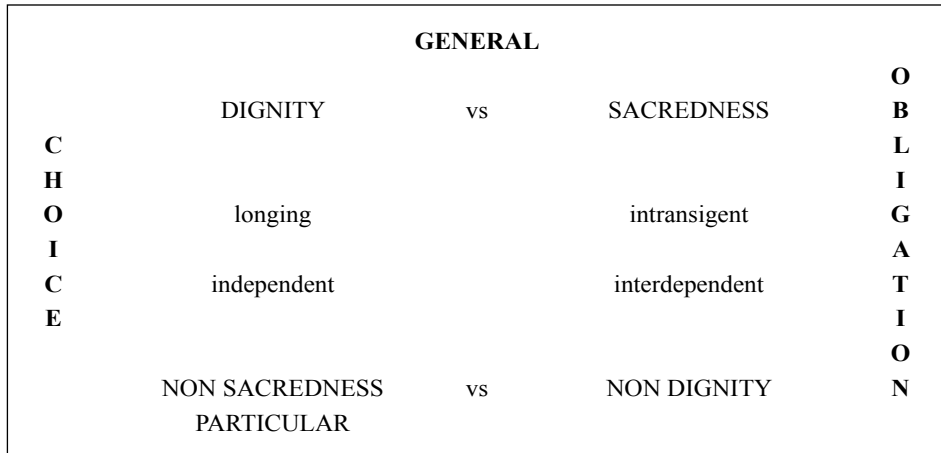


Figure 2: Semiotic-enunciating square of identity profiles in texts pro and against euthanasia

The enunciator “in favour of euthanasia” highlights the supreme value of the dignity of human life and tries to legitimize the figure of a longing person, who must be acknowledged as having the right (that is the power and the responsibility) of “unplugging”. The enunciator “against euthanasia” keeps himself tied to the need to respect human life and tries to validate the profile of an intransigent, unbending person, whose strength lies on the belief of being attuned with God’s Word. When the argument pro-euthanasia is based on enhancing the “non sacredness” of human life, it casts an enunciator with a strong need for autonomy. Texts “in favour of euthanasia” construct their subjects as being independent and in need of claiming for themselves the ability to control their own destiny. Living as a human being means: self-regulating. The value of ethical choices comes also from the principle of autonomy.

When the argument against euthanasia is based on the sense of “non dignity” of human life, it produces the profile of a person who is linked to the community and interested in underlining the social and civil contribution to the meaning of existence. Human life is featured by the trust in proximity, which makes communities take care of each other, however hopeless one’s condition is.

The opposing positions about euthanasia use two rhetorical macro-strategies that diverge in considering life either as a privately owned or as a gift. In any case, “the will of being alive is not only a simple answer to a natural expectation, but a cultural action that brings the freedom of choice into play, asking for on a huge psychological commitment for man” (TESTONI, 2007, p. 17). The metaphorical enunciates “Life is a privately owned” and “Life is a gift” draw their huge argumentative power from highlighting the difference between discursive acts. If “life is a privately owned, then society recognizes the personal conscience (or “free will”) as the only source of right; if instead it is a gift, then everyone and all together have to show gratitude to the donor and to be respectful of his laws. Indeed the two analogies are at odds, at an enunciating level (what can we say about life?), more than at a pragmatic-practical level (what can we do with our life?). In fact, a reified life, either as “private ownership” or as a “gift”, would give people the right of free disposal. It is not like this; in practice, while there is a difference at an enunciating level, since the two analogies belong respectively to the juridical or to the religious discourse. The public debate and the consequent political decision are discursive practices which organize the attempts towards meaning made by a society about these (and other) topics.

The interest in language urges most enunciators to involve their “diatextual power”, namely to use a few communicative resources in order to define how things should be said. This means that “through the text” the enunciator is engaged in shaping the world (of meaning). The diatextual power appears in the stylistic register “*not so...but...*”.

The terminological explanation is a common strategy, to mark the feeling that difficulties in understanding each other depend only on a confusion of words, so that just a lexical agreement could be sufficient to make opinions and beliefs converge. Thus in the media debate about euthanasia a lexical strategy is used, as the dialectic of different enunciating positions legitimized through the choice of different words. An effective version of lexical strategy can be found in the utterance “I’m against euthanasia, but I consider unfair the prolonging of artificial life support”, used by many participants in the “Welby’s affair” debate when opening or closing their arguments.

In conclusion, the social debate on euthanasia has a very special reflexive meaning since it allows us to take a position about this issue: what should we do when human life loses its “good shape”? The discursive genre of the “ethic dilemma” shows the difficulties that people (and communities) meet by managing meanings which are congruent with the “unmanageable” problems brought about by the experience of their being limited in time. Even within such an argumentative context, the use of language cast people (and cultural communities) in a diatextual “form of life”, that is in a process of pragmatic self-organization fed by the Gestalt principle that any enunciation can be perceived as an encounter of different voices (concerning “The rhetorical construction of euthanasia”, cf. MININNI; MANUTI; RUBINO, 2008).

Some opposing positions about euthanasia use two rhetorical macro strategies that diverge in viewing life either as a private ownership or as a gift. The metaphorical

enunciates “Life is a privately owned” and “Life is a gift” have such a huge argumentative power because they highlight a difference between discursive acts. If “life is privately owned”, then the society recognized the personal conscience (or “free will”) as the only source of right; if instead it is a gift, then everyone and all together have to show gratitude to the giver and to be respectful of his laws.

Indeed the two analogies are at odds not as much at a pragmatic-operational/ level (what can we do with our life?), but at an enunciating level (what can we say about life?). In fact, both as a “private ownership” or as a “gift”, a reified life would give to people the right of free disposal. It is not like this, in practice, while at an enunciating level they are radically different, belonging respectively to the juridical and to the religious discourses.

Similarly, the metaphor of life meant as a right rather than as a duty reveals two different interpretative repertoires of the pro and contra positions about euthanasia. Probably the use of a juridical metaphor answers the necessity to translate an entangled matter into a clearer frame of meaning.

A very powerful metaphor is that of life, as a candle, that is a finite resource. In this case, a candle is compared to life for its sensibility to time (it consumes itself as times goes by) and to external action (someone can put it out or throw it away). Then the use of such an analogical frame is artfully used by those who defend a contra euthanasia position as to stress that even if almost totally consumed a candle can still produce light.

Finally a quite bizarre metaphor is that used to refer to the Welby case as a Trojan Horse, to describe the effect that the legalization of euthanasia would have as a sly beginning of a dangerous destruction, turning into what in bioethics is called the “slippery slope”.

7. Concluding remarks

Applied psycholinguistics, meant as an action-research on the practices of humanization of personal and collective experience of life on earth, revises the main constructs of psychological exploration, starting from the self. The new interpretative horizons of subjectivities engage psychology in acquiring theoretical instruments to cope with the complexity of processes and with the ambivalence of differences which do allow the reciprocal acknowledgement self/other. A route of “situational understanding” (MANTOVANI, 2005), congruent with such levels of complexity is supplied by the linguistic and semiotic notion of “diatext”. In other words, people need texts because they reveal who they are. Really, identities are constructed by “texts -in-interaction”.

The corpus of media-texts analysed have shown the possible positions people (and their cultural communities) assume within the contestable narrative on the beginning of life. Within the debate heated by the referendum, the declarations “on behalf of the embryo” and “in support of knowledge and health”, have derived

their claim of validity by two opposing sub-cultures: that of “ethics” and that of “science”. The discursive construction of such identity positions and thus of the social representation has answered the inter-subjective dynamic aimed at deforming the expectations of reciprocal acknowledgement within the strategic practices of mis-acknowledgement. The inter-understanding process between individuals (and between communities) demands an agreement at least embryonic on the fact that any difference of evaluation in objecting to the world do not legitimize either hierarchical classifications or solipsistic closures, rather trace a horizon of possibilities for multiple belongings and fluid identifications, which belong to our time.

The social debate on euthanasia has a very special reflexive meaning since it allows us to take a position about this issue: what should we do when human life loses its “good shape”? The discursive genre of the “ethic dilemma” shows the difficulties that people (and communities) meet by managing meanings which are congruent with the “unmanageable” problems brought about by the experience of their being limited in time. Even within such an argumentative context, the use of language casts people (and cultural communities) in a diatextual “form of life”, that is in a process of sense self-organization fed by the principle that any enunciation can be perceived as an encounter of different voices.

When caught into a dilemma, the way to the dialogue is shaped as a bend, since the process of argumentation is obliged to account for a “double premise”. When the middle of the bend is reached, it is necessary to have at the same time control over the direction one is following since the beginning and over the direction necessary to come to the final goal. Similarly, when caught into a dilemma, the speaker adheres to a form of (intrapersonal) dialogue which tests the claims of validity of almost two positions (for instance “life is a gift” and “life is a privately owned”).

The diatextual analysis of the public debate on such dilemma hosted by two dedicated forums has highlighted the dialogical relationship between subjects, texts, and contexts. The discursive traces which have emerged from each e-mail reveal that the effort to mark one’s own position is always linked both to the voices from outside which contribute to shape the actual context of the discussion and to the necessity to recognize the other’s position as an invitation to exercise a diatextual power. Nonetheless, the texts analysed have shown how difficult it is to elaborate interpretative schemes of dilemma which could be shared by collective conscience. By expressing one’s own point of view, the opposing voices appeal to religious, scientific, economical and political sources, that is to discursive spheres which are used more to point out principles of power management rather than to promote the expectations of the moral autonomy of consciences. The analysis of the case study presented gives us further arguments to share Wittgenstein’s intuition according to which “the boundaries of my discourse are the boundaries of my life”.

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Flows of information in and between systems of lexical access

1. Introduction

The topic of the present text is the recognition and identification of spoken and written words in the final or skilled state of development. Words, either spoken or written, are the bricks of language comprehension. To make the meaning of words available to the system responsible for comprehension, it is necessary to begin by processing the corresponding acoustical or optic patterns and to derive from them phonetic and graphic representations that are already linguistic but not yet lexical. In order to compute and/or activate stored lexical representations, which are still modality-dependent, further processing is needed, and this is the function of the lexical access systems.

Traditionally, the identification of spoken words and the identification of written words have been studied independently of each other, with a major consequence, namely that these two lexical access system are considered not only as distinct but also as being autonomous, with no connection whatsoever between them. This is the case in Coltheart's (1998) modular approach that takes spoken and written language modules as autonomous from each other as well as from the visual object recognition module.

Obviously, written language is recognized as a secondary linguistic system. It is also widely accepted that, in order to acquire this system, children rely on the acquisition of grapho-phonological and phono-orthographic conversion procedures for reading and writing, respectively. However, the classic dual route model of adult skilled reading and reading aloud incorporates the "autonomy" assumption. According to this model, once the beginning reader has developed an orthographic lexicon, this is accessed directly, more precisely on the basis of graphemes and without phonological involvement, so that only the reading of pseudo-words and of unfamiliar words requires grapho-phonological mediation. Indeed, reading aloud involves phonological representations, but these are post-lexical in the sense that they are activated following word identification for the purpose of overt or covert production.

Concerning the primary linguistic system, the oral one, it is assumed to be even more autonomous relative to the written system, as its main development precedes the learning of literacy. Accordingly, the theoretical models of spoken word recognition that have been developed are almost all silent as regards the potential involvement of orthographic knowledge. It is the case of LAFS (KLATT, 1979), TRACE (McCLELLAND; ELMAN, 1986), of the Cohort (MARSLEN-WILSON, 1987) and the Fuzzy Logical (MASSARO, 1989) models, of NAM (GOLDINGER; LUCE; PISONI, 1989), Shortlist (NORRIS, 1994), etc.

However, in the last fifteen years for the written lexical access system, and in the last ten years or less for the spoken lexical access system, there has been increasing evidence either that the two systems are directly interconnected, or that each of them has provided the other with representations whilst keeping its own specific informational content. More specifically, phonological representations belonging or not to the auditory lexical access system are involved in the process of written word identification, and, reciprocally, orthographic knowledge influences the identification of spoken words. This text will present a description of the main empirical arguments that support this interactive view of the two lexical access systems, followed by a discussion of whether the proposed interactions generalize or not pre-lexical processing.

Before addressing these issues, an issue that is logically preliminary will be considered immediately. The notion of lexical access itself presupposes that something lexical preexists, or said differently, is stored in memory. Hence, the main question is: what is the nature of this “something lexical” that has to be stored, and how can it be computed during the access process?

For many years it has been explicitly assumed that words are stored in memory in a symbolic and structured way. For example, the English word “bright” is stored as either a sequence of phonemes (/braɪt/) or a sequence of letters or graphemes (“bright”), with some type of clue about the relationships between the elements within the word: /((b)(r)/((ai)(t))/ or “((b)(r)/((i)(ght))”. Its representation can also take the form of a tree. A polysyllabic word, for instance “spaghetti” (/spəˈɡetʃ/), needs of course some more information, in particular about the syllabic pattern and the position of stress. For both mono- and polysyllabic words, an even more abstract, less specified representation indicates only the nature of the segment, consonantal or vocalic (spaghetti is CCVCVCV).

It should be noted that not only the orthographic representations of words but also the phonological ones rely on alphabetic symbols, even if in the latter case it is the IPA. Phonetic transcriptions would have been impossible in an illiterate society. Actually, all modern linguistics is under the influence of literacy. Our intuitions are those of literate individuals and this probably explains why the linguistic descriptions of speech are segmental. Port (2007, p. 145) points out that the alphabet is the foundation for all the apparatus of formal linguistics (...). No formal linguistics is possible without some *a priori* alphabet of discrete tokens”. It is the mission of psychology, and in particular of psycholinguistics, to shake these literate intuitions and look underneath them. Psycholinguistics is not constrained by formal descriptions; its goal is to understand what is going on in the mind.

Children speak and understand language before they have any segmental description of it. Illiterate adults, as has been shown, are not aware of speech as a sequence of phones or phonemes (MORAIS *et al.*, 1979; MORAIS *et al.*, 1986), and this lack of awareness is actually not associated with illiteracy but with alphabetic illiteracy, given that non-alphabetic literates, for example in China (READ; ZHANG; NIE; DING, 1986), perform in phoneme awareness tasks like European illiterates. Hence, it seems that, in order to understand correctly the basic mechanisms of

language, including word processing and lexical access, one ought to study illiterates rather than literate individuals. In this text, some work done with illiterates in this perspective is described.

All of us, literate people, are indeed persuaded of the perceptual reality of phone- or phoneme-based descriptions of speech. This conviction is based on our vivid experience that each of these syllables, from /di/ to /du/ begins with the same sound, but acoustically at least, it is not true. We hear it with the same sense of reality as we see other people here in this room. Almost thirty years ago, an anonymous expert called to evaluate the manuscript that became Morais *et al.* (1979), and certainly a distinguished psychologist, rejected as impossible our discovery that illiterates do not share that auditory experience with us. He objected that even babies can discriminate syllables like /ba, da, ga/ and declared peremptorily “I cannot believe in those results”. Scholars are not in a better position to judge on this matter than the layman. As Port (2007, p. 153) wrote, “Saussure (1916) pronounced forcefully that linguistics should study the spoken language and not the written language. (...) But it turns out that, by employing phonetic transcriptions as the standard form of data for research in linguistics, the discipline never escaped from studying languages in written form”.

Phonemes are convenient concepts with the same characteristics as letters: they are discrete and static, they are serially ordered, do not overlap, and form a finite and small set. This does not imply that they do not have a more basic reality of their own, other than the one derived from the alphabet, but merely that phonemes could indeed be cognitive fictions of our alphabetic education. Port (2007) makes this claim. Although I admit it could be true, I do not share it. Indeed, I believe that not only can it be examined through experimental psycholinguistic research but also that there is already some evidence incompatible with it.

Let us come back to the question “how are words stored in memory?” Port (2007) says that they are not stored as abstract phonological segmented structures or as sequences of phonemes, although he recognizes that such a symbolic representation can be, and is, useful, after word identification, for working memory and reasoning. He proposes instead, with other authors, such as Goldinger (1996), that words are stored as representations of concrete, continuous events, richly detailed trajectories, in an episodic memory, an *exemplar* memory. He argues that “listeners employ a rich and detailed description of words that combines linguistic and nonlinguistic properties of recently heard speech signals” (Port, 2007, p. 145).

Significant empirical evidence for this type of “episodic” coding comes from a study of Palmeri, Goldinger and Pisoni (1993). These authors used a “continuous word-recognition task”, in which subjects listened to a continuous list of recorded words, some tokens of which were repeated, and they were required to indicate whether each word was new or a repetition. Different speakers had recorded the words and the subjects were instructed to ignore talker variability. Accuracy decreased with lag in repetition, which is a trivial result. The interesting finding is that listeners did 8% better if the second presentation of a word had the same voice as the first presentation,

and this difference was unaffected by the number of voices (from 2 to 20). Thus, it seems that the listeners were using idiosyncratic features of the voice to help recognize the words, and they would do it automatically. This improvement due to voice identity lasted for a week (GOLDINGER, 1996). According to the authors, an auditory rather than linguistic code can be used. This auditory code would register not only voice but also characteristics like speaking rate, intonation, etc.

The fact that nonlinguistic characteristics can help one to recognize a word as repeated does not constitute an argument against the traditional phonological models of word recognition. Actually, this apparent argument rests on the confusion between recognition of a word in the sense of feeling it as familiar and hopefully identifying it, which corresponds indeed to lexical access, and recognition as a memory capacity. The word “recognition” has only one phonological and orthographic form, but it has many senses that can only be specified by the context. In the study we are discussing, all words, new and repeated, had to be accessed and presumably identified. The point is that the task involved something else that intervenes after lexical access: it involved deciding whether the word was new or repeated, so it involved access to an episodic memory. Thus, one should not accept the claim that lexical access involves non-linguistic episodic traces when the task, besides or beyond lexical access, requires access to these episodic traces.

One is confronted here with the same kind of mistake that is made when one takes evidence from metaphonological tasks to make inferences about speech perception. Task analysis as regards the capacities involved and in particular as regards levels of processing is a crucial issue to avoid errors of interpretation.

In sum, given that there still is no persuasive evidence to believe that our lexical representations are episodic exemplars, it seems more reasonable to continue admitting that some structure must be stored to guide computation, whatever the complexity of this computation. Moreover, as discussed in more detail below, there are reasons to share the two-fold idea, dominant in modern psycholinguistics, that (1) for spoken word recognition the lexical representation is at least phonologically structured, if not also orthographically (in literate people), and that (2) for written word recognition the lexical representation is at least orthographically structured, if not also phonologically.

Concerning the conception of the mind and, more specifically, of the language system as symbolic, Port (2007, p. 158) argues that symbols are not available a priori. He says: “The concept of a formal symbol system is a culturally transmitted technology that was inspired, in my hypothesis, by orthographic writing and arithmetic.” I must say that in more than 30 years of work with illiterate adults I never interrogated them about their “concept of a formal symbol system”, and would not be surprised if they had just stared at me. More seriously, their lack of such a conscious concept does not invalidate that their spoken language system may indeed be symbolic. Historically, it was important to discover that literacy and formal education have profoundly influenced our conscious thought. However, what we are assisting now, if we take

the hypothesis formulated by Port as representative of a diffusing view, may be a sort of pendulum effect. The backward movement of this idea goes too far and leads to reject all preliterate and pre-numerical symbolic capacity. Even if it were true that “all mental symbols get their discreteness (...) from physical ones like letters and numerals” (PORT, p. 157), one cannot but wonder from what mental capacities letters and numerals got their discreteness.

Before describing some experiments that are relevant to know how words are stored, it is worth presenting two ideas that one will find subsequently in more concrete form.

First, the parsimony rule should not be followed in our approach of the mental organization of the language system for the following reason: redundancy may increase the efficiency of the system, in terms of both rapidity and precision, and may protect it to some extent from damage. If, for example, it were found, as it seems to be the case for the speech perception process, that intermediate structures or units are represented between phonetic and lexical representations, the question “what is *the* unit?” becomes senseless.

Second, according to Dehaene’s (2005) conception of neural plasticity, the establishment of a neural circuitry for written language processing may have had significant effects on the computations that were performed on those areas before the learning of literacy. For reasons of neural vicinity, Dehaene suggested looking for modifications in the abilities to process various aspects of visual information. Also for reasons of functional vicinity, I suggest looking for modifications in some aspects of the spoken language system.

2. Spoken word recognition

A classic method to study the units involved in speech perception is the unit detection or monitoring task. The problem with this method is that, by instructing the subjects that the target is a particular unit, the task becomes metaphonological, in the sense that it requires operations of conscious analysis. Because this unit becomes the focus of attention, one cannot discard the possibility that it is not represented, or is represented otherwise, when one listens to speech for mere recognition. Quite interestingly, Kolinsky (1992) devised a new method that allows one to examine the units involved in speech perception in an indirect way, without calling the subjects’ attention to the units under study.

In this method, inspired from research on visual analysis in object perception (TREISMAN; SCHMIDT, 1982), two speech signals, usually pseudowords (nonwords consistent with the phonotactics of the subject’s language) are presented simultaneously, each to one ear. The two stimuli (for example, /kiʒu – bɔtɔ/ contain all the information necessary for the illusory perception of a French word (bijou / biæu/, or coton /kɔtɔ/. This information is distributed between the two stimuli so that the combination during perceptual analysis, if it occurred, of parts of one input

representation with parts of the other input representation creates the illusion. In this example, combination of the /b-/ with the /-izu/ would lead to a false detection of /biju/. If one presents /bitʃ/ and /kɔʒu/, by “migration” or exchange of the syllables one would perceive also bijou (or coton). With this method, and using the same set of phonemes, it is possible to evaluate and compare the involvement of different units and phonetic features in the perceptual analysis of speech.

Note however that the listener could have the illusion of hearing bijou simply because /kizu/, for example, is very similar to bijou. One therefore needs a control condition in which /kizu/ is opposed to say /dɔtʃ/, which means that in this trial only the critical /b-/ is missing. Thus, it is the extra number of false detections in the former condition (experimental) compared to the latter one (control) that gives evidence of the perceptual involvement of the unit. More exactly, given that it is necessary to distinguish the sensitivity of the perceptual system from the S’s tendency to say yes or no, one can calculate a measure of perceptual discrimination in terms of the score d' and one therefore obtains evidence for perceptual involvement of the unit when d' in the experimental condition is significantly lower than d' in the control condition.

Using this method, Kolinsky, Morais and Cluytens (1995) found that, in French, the syllable is the most prominent perceptual unit. In Portuguese, the syllable is also relevant, but the most prominent unit appears to be the initial consonant, in both the European and the Brazilian varieties (KOLINSKY; MORAIS, 1993). Moreover, we tested Portuguese and Brazilian illiterates and found the same pattern of results. The initial consonant is involved in the perceptual analysis of speech in people who have no conscious awareness of consonants, and the testing of Portuguese preliterate children confirmed this conclusion (MORAIS; KOLINSKY, 1994; CASTRO *et al.*, 1995).

As far as illiterate individuals are concerned, this is not an isolated result. Speech production is out of the scope of the present main topic, but it is interesting to mention that, in illiterates, Ventura, Kolinsky, Querido, Fernandes and Morais (2007) obtained confirmatory evidence of the involvement of the initial consonant in object naming. We used a cross-modal picture-word interference task, very much like Brooks and MacWhinney (2000) did to evaluate whether young children shift from holistic (rime) to detailed (segmental) phonological encoding. Our participants were adults: illiterates, ex-illiterates and literates. They had to name pictures while hearing distractor words at different stimulus-onset asynchronies. In the phoneme-related condition, auditory words shared only the first phoneme, a consonant, with the target name. All groups named pictures faster with phoneme-related word distractors than with unrelated word distractors. It thus seems that phonemic representations intervene in phonological output processes independently of literacy.

In the developmental literature, a “lexical restructuring” hypothesis has been proposed, which claims that, as vocabulary increases, lexical representations become more and more segmental. This hypothesis was first put forward by Studdert-Kennedy (1987) and in more recent years by Metsala, Walley (1998) and Garlock, Walley and Metsala (2001). As more words are learned, the greater is the quantity of similar

(neighbor) words, and the greater the necessity of segmental lexical representations to discriminate among them. It was thus justified to verify whether literacy learning could at least accelerate the shift from holistic to segmental representations, a hypothesis that was contemplated by Goswami (2000, 2002). In the same vein, Muneaux and Ziegler (2004) suggested that the acquisition of orthographic representations could change the nature of the phonological representations involved in spoken word processing.

To test the hypothesis of an influence of literacy learning on the lexical restructuring process, Ventura, Kolinsky, Fernandes, Querido and Morais, (2007) compared illiterates and literates in a gating situation, where auditory information about a word is gradually disclosed. On the basis of initial information, for example the first 30 ms, the listeners attempt to identify the word, and if they cannot, there are subsequent length increments by steps of 30 ms until the word is recognized. The rationale of this study took its inspiration in Metsala's (1997) article in which both the frequency and the neighborhood density of the words were manipulated. (When one word has many neighbors words differing from it by only one phoneme - one says that it belongs to a dense neighborhood, and when it has only a few neighbors it belongs to a sparse neighborhood.) Metsala tested children aged 7 years and more and found an interaction between frequency and phonological neighborhood. For high-frequency words, the "isolation point" (duration at which the listener could identify the target) was longer with words from a dense neighborhood than with words from a sparse neighborhood. This effect would result from the *on-line competition* between the lexical representations of words that are phonologically similar. More neighbors lead to more competition. For low-frequency words, the opposite pattern of results was observed. This would be a *structural effect* linked to the developmental phase and would reflect the fact that the pressure on these words for segmental restructuring is stronger when the neighborhood is dense than when it is sparse. This structural effect would not concern high-frequency words, because their representations already had the opportunity to become highly segmented whatever the density of their neighborhood.

In our own study just cited (VENTURA *et al.*, 2007), we used both « gating » and a task of word identification in noise, and found that the interaction between word frequency and neighborhood density was present in both the illiterates and the literates; moreover, this interaction was not modulated by literacy. In particular, the illiterates did not differ from the literates on the low-frequency words with few neighbors. The phonemic restructuring of the lexical representations thus seems to occur independently of literacy.

A further experiment reported in the same paper supports the idea that lexical restructuring provides a foundation but is, by itself, inefficient, to the acquisition of phoneme awareness. We indeed found that, in both illiterates and ex-illiterates, the performance in a phoneme deletion task was significantly better for words from a dense neighborhood than for words from a sparse neighborhood, something that had previously been observed in children (DE CARA; GOSWAMI; METSALA, 1999;

STORKEL, 2002). In spite of this effect, the mean score of the ex-illiterates was much higher than the one of the illiterates (78 and 18% of correct responses, respectively). This huge difference confirms of course the critical role of alphabetic learning in the development of phoneme awareness.

Above, evidence was presented on the units involved in the recognition of spoken words and on the fact that, with the expansion of the phonological lexicon, the structure of the lexical representations becomes more and more fine-grained. However, there is also evidence of a form of phonological representation that is still segmental but highly abstract. This is the so-called “abstract phonological structure” or the “phonological skeleton” as proposed by the autosegmental linguistic theory (CLEMENTS; KEYSER, 1983), i.e. a sequence of consonant-vowel slots. In the production of speech, there is evidence of it from aphasic patients (CARAMAZZA *et al.*, 2000; SEMENZA *et al.*, 2007) but also from experimental studies (SEVALD; DELL; COLE, 1995; FERRAND; SEGUI, 1998; COSTA; SEBASTIAN-GALLÉS, 1998).

Floccia *et al.* (2003) obtained experimental evidence for the involvement of this kind of structural representation in spoken word recognition, too. We used a same-different word comparison task, in which the listeners respond as fast as possible whether two successively presented words are the same or different. Again, their attention is not called to any feature or unit in the stimuli. The idea is to infer whether, when they respond different, they rely on a discrepancy in the initial syllable or in the abstract phonological structure. There were two types of pairs. In pairs like *pa.lette* - *pa.tron* (/pa.l/ - /pa.tr/), the words differ by the phonological structure but not by the first syllable; and in pairs like *pal.mé* - *pa.tron* (/palme/ - /part/) the words differ by the first syllable but not by the phonological structure. The results of one of the experiments did not show any difference between the two types of pairs, even for the fastest subjects. However, in a further experiment using the same stimuli, but asking the subjects to respond only to the “different” trials and giving them feedback about their response times in order to obtain responses really fast, we found that pairs with same first syllable but different phonological structure elicited the fastest responses. We replicated this effect after cross-splicing the acoustic segment corresponding to the first three phonemes (/pa.l/ - /pal/) to be sure this was not an acoustic effect. Thus, it seems that, whatever happens later on, the abstract phonological structure is extracted very early and can be used to recognize words.

The findings described above lead to two important conclusions. First, the lexical access system that supports the recognition of spoken words uses phonological representations that are **segmented** (syllables, phonemes) and may correspond to abstract properties, like the consonant-vowel status of the phonemic sequence. The lexical access system seems to contain mechanisms that look for these structural aspects of the stimulus and match them to a structurally defined stored representation in the phonological lexicon. It must be noted that all the data of our own experiments were obtained in word recognition tasks that avoided intentional focusing on segments. The second conclusion is that the segmental representations used in recognizing

spoken words are not derived from learning an alphabet, given that (excepting for the phonological skeleton, on which we did not test illiterates) we found similar patterns of results in literate and illiterate populations. We do not know if the format of those representations is symbolic, but, whatever it is, these segmental representations approximate to what at least, by convenience or lack of more precise knowledge, one call symbols. This is a very important point. It is impossible to maintain, as Port (2007) did, that segments are just a creation of literacy in face of evidence that illiterates, like literate people, do use segments in at least some speech perception tasks.

Concerning the flow of information in the whole system that serves spoken word recognition, one should distinguish a general level of speech perception, which is valid for both words and pseudowords, and a level that concerns lexical access specifically. At the general level of perception, as indicated above, there would be no influence of literacy. Consistent with this idea, we found that illiterates did not differ from literates on a /ba-da/ perceptual categorization experiment (SERNICLAES *et al.*, 2005). The observed discrimination scores were similar to those predicted from an identification task, in both groups. In contrast, still comparing illiterates and literates, we found evidence that literacy has an impact on the latter, lexical access level (MORAIS; CASTRO; KOLINSKY, 1991). One illusion that is under the influence of lexical factors is the phonological fusion: presented dichotically with “back” and “lack” people tend to hear “black”, but such illusions are much more frequent when the resulting fusion is a word than when it is a pseudoword or a nonword. With Portuguese listeners, we found that the word fusion “plena” was obtained from the pair “pena-lena” in almost 60% of the subjects, literates and illiterates. Note that the very occurrence of this illusion indicates that in both groups of subjects the consonant was at some perceptual level separated from the remaining of the stimulus. This was also the case (55% more exactly) for the word fusion “p(e)lar” from the words “par-lar” in the illiterate listeners; but in the literates, only 17% of the subjects reported this illusion. The illiterates could experience the illusion for both types of pairs because they do not know how the words are spelled. In contrast, the literates know that “pelar” is written with a “e” that, in the European dialect, is silent. And it is, in all likelihood, this orthographic knowledge that leads to their inhibiting the fusion. “Par” and “lar” could not easily fusion into “pelar” because the literates know that /plar/ is orthographically represented with an intermediate letter.

Further discrepant behavior of literates and illiterates occurred when, in dichotic listening, they were asked to identify the word presented to a pre-specified ear (MORAIS *et al.*, 1987). The proportion of errors limited to one segment (for example, reporting “mapa” instead of “capa”) was greater in the literate people, whereas the proportion of more global errors, involving at least one whole syllable, was greater in the illiterates, even when the two groups were equated for overall performance. We interpreted this difference as reflecting the resort by the literate group to a strategy of listening focusing on the phonemes, a strategy that is not available to the illiterates because these are not aware of phonemes. This interpretation in terms of strategy of

attention was confirmed in a further experiment of Castro and Morais (unpublished) in which we obtained, in a group of university students, an increase in the proportion of segmental errors by simply instructing these subjects to attend to the constituent phonemes.

Effects of alphabetic or orthographic knowledge on speech processing have been frequently observed in subjects that are all literate, by manipulating the task and/or the stimuli. However, until a seminal finding by Ziegler; Ferrand (1998) to be described later, these effects do not concern processes of lexical access. They concern either phonological intuitions or conscious, intentional processing. A very brief illustration of these findings follows.

Ben-Dror, Frost and Bentin (1995) found a long-lasting effect of the writing system on phoneme and syllable deletion. To delete the initial phoneme of an utterance, English literate adults were faster than their Hebrew pairs, whereas to delete the initial syllable the Hebrew were faster. This is related to the fact that the alphabet represents phonemes, even if it is in a complex way, while the Hebrew system is only a semi-alphabet, with the characters corresponding to sets of syllables.

Ventura *et al.* (2001) used Treiman's (1983, 1986) blending game: it consists in forming a CVC word or pseudoword from the initial and the final part of two presented CVC items. The aim of the task is to explore phonological intuitions about the internal structure of the syllable. It happens that, in Portuguese, phonological CVC words can be written CVC or CVCV in which the final V is a silent "e". Literate adults preferred the CVC segmentation when the words are written CVC (for example, /be/ for /ba-/me/, but the CV/CV segmentation when the words are written with a mute "e" (/ku/, not /ke/, for /ku-/pe/, "cure"-pele). This influence of spelling was observed even when the stimuli were pseudowords for which the potential spelling was induced by a context of words, all with or all without the silent "e".

Dijkstra; Roelofs; Fiews (1990) found that reaction times in the detection of the phoneme /k/ were slower when its spelling is (in Dutch), non-dominant (like in "replica") than when it is dominant (like in "paprika"), the effect being stronger when the phoneme occurs after the word uniqueness point, the point from which there is only one possible candidate in the lexicon than when it occurs before (56 and 21 ms). This stronger effect after the uniqueness point indicates a lexical contribution to the phoneme-detection process. However, we have to consider that, although this task is an on-line task of speech processing, it is not a perceptual task or one of word recognition. Some authors (for example, Castles *et al.*, 2003) interpreted this and similar results as indicating an automatic co-activation between closely linked orthographic and phonological representations. Perhaps, but, even if this co-activation were automatic, which should be verified by appropriate experiments, it is impossible to say that it occurred in lexical access rather than after it.

Anyway, at the lexical access level, there are now strong indications that the corresponding processes are not exclusively phonological. Ziegler; Ferrand (1998) were the first to demonstrate an influence of orthographic knowledge on such processes.

These authors manipulated the orthographic consistency in transcribing phonological segments. In French, the rime /iʃ/ is consistent because it is spelled in one way only, “iche”, like in “riche”, but the rime /ɔ̃/ is inconsistent; it can be spelled in 11 different ways: “on” (“mon”), “om” (“nom”), “ont” (“vont”), “onc” (“jone”), “ong” (“long”), “ompt” (“prompt”).

In the auditory lexical decision task, the words with inconsistent rimes produced longer latencies and more errors than did the consistent words. We confirmed this effect for Portuguese (in Portuguese, /-al/, for instance, is inconsistent (cf. “cal” – “cale”), and /-av/ is consistent because it is always spelled with a silent “e”) (VENTURA *et al.*, 2004), and we replicated it in French (PATTAMADILOK *et al.*, 2007).

However, the effect must occur relatively late in the recognition process. First, if the influence of orthographic knowledge occurred at all stages of speech processing, in particular if it occurred also at the general perceptual stage, then the consistency effect should be observed not only for words but also for pseudowords. Yet, neither Ziegler and Ferrand (1998) nor Ventura *et al.* (2004) did observe it. This argument is however somewhat weakened by the fact that Pattamadilok *et al.* (2007) observed an effect on pseudowords.

Anyway, there are other reasons to believe that the orthographic consistency effect does not occur before the processes of lexical access. In particular, if it occurred at the general perceptual level, it should be observed in other speech tasks like shadowing or immediate repetition. Shadowing taps mainly a pre-lexical level of processing, as it is affected much less by a lexical variable like word frequency than is the case for lexical decision. As a matter of fact, in none of the studies (PATTAMADILOK *et al.*, 2007; VENTURA *et al.*, 2004; ZIEGLER; FERRAND; MONTANT, 2004) was a consistency effect observed in shadowing, for either words or pseudowords.

Finally, having compared two situations in which a shadowing response was made contingent upon either a lexical or a phonemic criterion, we found an effect of orthographic consistency with the lexical criterion, that is to say when only words had to be repeated (VENTURA *et al.*, 2004); but with the phonemic criterion, more precisely when only those items that had a pre-specified phoneme at the beginning were supposed to be repeated, there was no consistency effect. Thus, it seems that the orthographic consistency effect is produced in the course of lexical processing.

What is the mechanism whereby orthographic knowledge affects the lexical processing of speech stimuli? We assume, according to Grainger; Ferrand’s (1996) bimodal interactive activation model, that phonological and orthographic representations are interconnected at both sub-lexical and lexical units. What happens when the phonological representations activate the orthographic ones? In the case of an orthographically consistent unit (/iʃ/), only one orthographic representation would be activated (“iche”), whereas in the case of an inconsistent unit (/ɔ̃/) several orthographic codes would be activated (“on”, “om”, “ont”, “onc”, “ong”,...). The model also assumes that the orthographic representations feed back to the phonological ones. Feedback from a single spelling would reinforce the activation of the phonological

representation, but in the case of multiple spellings most of the feedback would activate inappropriate words and would make the access to the representation of the target word more difficult.

Two non-exclusive possibilities follow from this interactive activation. One is that the activation level of inconsistent words would be reduced compared to the activation level of consistent words. The other is that, as a consequence, inconsistent words would be in a more difficult situation at the competition process. Selection of the target word would indeed operate in a more comfortable situation if evidence points clearly to a single candidate on the basis of both phonological and orthographic activation.

As we worked both in Portuguese and in French, we were able to compare the size of the orthographic consistency effects. Doing this we found that the Portuguese listeners presented a smaller consistency effect in lexical decision than the French-speaking ones (effect sizes were 0.85 and 2.17, respectively). It thus seems that the consistency effect may itself depend on the overall level of inconsistency in the language's orthographic code. In French, the degree of inconsistency is greater, and confrontation with frequent orthographic inconsistencies seems to lead to greater sensitivity to these variations. For instance, the French spoken word /pẽ/ may refer to "bread" or "pine" or "(he/she) is painting", depending on its spelling ("pain" vs. "pin" vs. "peint"). The orthographic representation, activated during the process of recognition of the spoken word, may help the processing of oral language by providing additional information that it is not present in the phonological representation. Our result suggests that the inconsistency of the written code not only affects the written word processing but also has a repercussion, via the interconnections between the two systems, on the processing of spoken words.

Obviously, the influence of orthographic knowledge on spoken word processing has to develop with literacy acquisition, and two rather different developmental patterns might be considered. One is that extensive practice of reading, automatic written word recognition is necessary for this influence to be established. The other is that intensive use of grapho-phonological transcoding procedures during literacy learning, contributing quite rapidly to the establishment of connections between the written and the spoken system, allows orthographic inconsistency to affect the recognition of spoken words.

Ventura, Morais and Kolinsky (2007) tested Portuguese second-, third- and fourth-graders as well as adults on new material consisting of words that the children find in their textbooks. We were surprised to observe that the orthographic consistency effect was present from second-grade, not only in auditory lexical decision, but also in shadowing (immediate repetition) and on both words and pseudowords. The adults displayed the usual effect limited to lexical decision, and in this task limited to words. We checked for any unsuspected bias in the material by testing also illiterate adults and preliterate children, and, obviously, but reassuringly, did not find any consistency effect in these populations.

Thus, there is an adult type of consistency effect that is specific to lexical access, and, in this access process, possibly established at the word selection phase. And there is a beginning reader type, which is a general effect. Always based on the bimodal interactive activation model (GRAINGER; FERRAND, 1994), we interpreted this shift from a general to a selective effect in the following way. Children learning to read and to spell rely on grapho-phonological and phonographic conversion, focusing quite intensively on sub-lexical units. This produces a strong flow of information between orthographic and phonological representations at the sublexical level, which leads to a consistency effect for both words and pseudowords and in any task that requires activation of this structural level, even in a task like shadowing that does not necessarily require lexical processing. At this stage of literacy acquisition, word reading and spelling are in most cases the mere result of sub-lexical processing.

In the skilled reader, sub-lexical correspondences are not frequently employed, so that flows of information between orthography and phonology are rather weak at the sub-lexical level. The skilled reader has instead developed a large orthographic lexicon, with strong connections with the phonological system, thus allowing the consistency effect to occur only on those items and for those tasks in which lexical access is involved. The conditions under which the orthographic consistency effect is obtained thus provide, in our view, a sort of thermometer of how “hot” are the functional connections between the orthographic and the phonological systems at the lexical and sub-lexical levels.

Further, still unpublished work, replicated this pattern of results with fourth-grade children and found that, by the sixth grade, the children had mostly reached the adult type of consistency effect. This is true for Portuguese, or more exactly, for typical Portuguese children in the Portuguese learning context. For French-speaking Belgian children, we found a much more accelerated development. Only second-graders displayed the general consistency effect. Third- and fourth-graders displayed, like adults, the consistency effect in lexical decision but not in shadowing (PATTAMADILOK *et al.*, 2009).

Two explanations can be offered for this differential developmental trend. One is the “orthographic code” hypothesis. French-speaking children, as they face much more orthographic inconsistencies than Portuguese ones at the sub-lexical level, begin earlier to associate systematically the orthographic and the phonological forms of words. Unfortunately, there is only scarce evidence to support this idea. In Fernandes *et al.* (2008), we found Portuguese children display difficulties with complex graphemes by the end of first-grade, difficulties that French ones do not display from the middle of first grade. In the same vein, again by the end of the first grade, our Portuguese children did still not display a lexicality effect, contrary to the French. The other hypothesis is less interesting, at least taken alone: for pedagogical, rather than psycholinguistic reasons, the Portuguese children would rely on sub-lexical correspondences in reading and spelling for much longer than the French ones. Of course, the two factors are not

exclusive of each other and might conjointly determine the disparity that we observed. A smaller degree of orthographic inconsistency in the written language may encourage sub-lexical reliance for a longer period in learning to read.

In French, Ziegler and Muneaux (2007) found in beginning readers a further orthographic effect, not of orthographic consistency, but of orthographic neighborhood. This study follows another, done on adults (ZIEGLER; MUNEAUX; GRAINGER, 2003), in which phonological neighborhood was found to have an inhibitory effect on lexical decision, and orthographic neighborhood was found to have, instead, a facilitating effect. This means that listeners process spoken words with many orthographic neighbors (for example, WIPE) more quickly than words with few orthographic neighbors (for example, TYPE). Ziegler; Muneaux expected this effect to be absent in beginning readers (7-years old) as well as in older dyslexics, as neither of them have a large orthographic lexicon, but to be present in advanced readers aged 11. These expectations were confirmed. Analysis of the beginning readers group further showed that the more advanced of them also showed a facilitative orthographic effect. Thus, it seems that this effect may provide an indirect indication, through a speech task, of early progress in the constitution of the orthographic lexicon.

Both this effect and the developmental shift that we observed in the consistency effect have interesting practical implications. Using spoken word recognition as a test of orthographic development avoids affective reactions to written material and may thus be appropriate to evaluate the orthographic abilities of dyslexics.

Before leaving the spoken word recognition part of the present discussion it is appropriate to come back very briefly to the first theoretical issue we addressed, namely the great divide between abstract segmental models and episodic or sub-symbolic models.

We would have great difficulty in attempting to account for the orthographic effects we have been discussing if the representations involved in spoken word recognition were not, first, phonological, and second, symbolic and abstract. The very existence of an orthographic influence on the recognition of spoken words indicates that the format of both phonological and orthographic representations has something in common, so that each can recognize the information conveyed by the other. As orthographic representations are certainly symbolic and abstract – this is hardly disputable –, phonological representations must also be symbolic and abstract.

This does not imply that the episodic models are completely wrong. One should remember what has been said about the redundancy that characterizes complex biological systems. Episodic acoustic-like traces may assist the phonological system in spoken word recognition. Moreover, one should acknowledge (and not take it as redundant) the possibility that episodic traces have a specific function in speech communication. For example, in the discussion that follows an oral presentation in a meeting the listeners need to remember what the speaker said and how he/she said it. “Hearing” the speaker’s voice in one’s head does not exactly involve a symbolic representation.

Spoken word recognition may, for example, be influenced, at the level of competition and subsequent word selection, by acoustic differences between voices. Recently, Creel, Aslin and Tanenhaus (2007), using an eye-tracking methodology, found that lexical competition was attenuated by consistent talker differences between words that would otherwise be lexical competitors. More precisely, they found that, after repeated instances of talker-word pairings, words from different-talker pairs (male *sheep*, female *sheet*) showed smaller proportions of competitor fixations than words from same-talker pairs (male *couch*, male *cows*). The talker difference helped in eliminating the competitor. This suggests a view of the lexicon as containing extra-phonemic information.

The fact, that the auditory word lexical access system is basically phonological and abstract, does not imply that other sources of knowledge cannot be used to assist it, in spoken word recognition. One is the system of orthographic representations, a system that either is used in written word recognition or is a copy of it. Another source is the trace of listened speech episodes. Still another is the system of semantic information. Radeau *et al.* (1998) reported an illustration of this influence. Using an auditory lexical decision task, they found that repetition effects in reaction times were more pronounced for semantically related than for unrelated target words; consistently, the amplitude of the N400 component to related words was diminished by repetition, but not that for unrelated words. Assuming that repetition elicits an episodic trace, this seems to interact with semantic information.

As far as development is concerned, spoken word recognition in the infant is likely to be served by a poorly segmented phonological system, so that episodic traces and their combination with affective meaningful situations play a relatively important role. The progressive development of a finely segmented and abstract phonological lexicon does not eliminate the contribution of these sources of information, but this kind of phonological lexicon is necessary for accurate and fast word recognition among a very rich oral lexicon.

3. Written word recognition

Earlier we examined the situation in which orthography introduces itself in the recognition of spoken words. We now consider the reverse situation, the involvement of phonology in reading, not only post-lexically, for reading aloud or for the purpose of working memory, but as an essential component of the identification of written words. This situation can be represented, in the context of the McClelland and Rumelhart's (1981) model of interactive activation, as Ferrand and Grainger (1992) depicted it.

How the utilization of the phonological procedures leads to the establishment of an orthographic lexicon during learning to read will not be considered here, for lack of time and also because there are many papers available on this issue. For the same reasons, the question of the possible phonological nature of the intermediate units,

graphemes, onsets and bodies, syllables, etc., that are involved in the recognition of printed words will not be examined either, at least in any detail.

The main question for the present purpose is the same that we already considered for spoken word recognition but reciprocated, thus now as regards written word recognition, i.e. whether lexical access from written words involves the activation of phonological representations,.

This question has, by now, received a positive answer, although there are different views on the part and precocity of the role played by phonological representation in the recognition and identification of written words. There are essentially two views, the weak and the strong phonological theory (see discussion in RASTLE; BRYSAERT, 2006). According to the “weak” theory, this recognition proceeds both through a direct orthographic pathway and through an indirect phonologically mediated pathway. The phonological influences are thus secondary and non-essential. According to the “strong” theory, the orthographic form is rapidly converted to a phonological code and this is an obligatory component of the process. The conceptual distinction between the two views is not as simple as this definition may suggest, and the evidence, from many studies using different experimental paradigms (forward- and backward-masked single word identification, forward-masking reading aloud and lexical decision, and text reading), is of complex interpretation.

Here, I will not discuss or even take a position in this debate, and will just describe a few results indicating that some orthographic representation is indeed activated first (one must recognize that it would be difficult to figure out how it could happen otherwise), and that a phonological code is also activated automatically from the earlier orthographic representation and in time to influence the recognition of the written word.

Rayner *et al.* (1995) provided one among many illustrations of these two ideas. They did this in a situation of text reading, using eye fixation duration as measure. When the readers fixated, for instance, the word “prefer” in the sentence “birds prefer beech-trees for nesting”, a non-word was presented in parafoveal vision. When they made the saccadic movement to the right they found, depending on condition, one of four different displays. In the *Normal* display, the target word was presented at the beginning of the next fixation. In the *Orthographically Similar* display, the word fixated only differed from the target word by one letter. In the *Homophonous* display, it also differed by only one letter, but its pronunciation was exactly like that of the target word. And in the *Dissimilar* display, it differed from the target by all the letters. Thirty or 36 ms after the beginning of the fixation, the target replaced this “prime”. The reader noticed that something happened, but was unable to identify the prime.

Obviously, the presentation of a prime that was different from the target created an interference effect and led to a considerable increase in fixation time. This increase was the greatest for the dissimilar prime. More interesting, one expected the orthographically similar prime to elicit a gain when compared to the dissimilar prime; and the main question was whether the homophonous prime could lead to an

even greater gain. The results showed that, with a prime duration of 30 ms, there was an orthographic similarity effect, and that with a prime duration of 36 ms there was a supplementary gain due to homophony. This pattern of results was also obtained with a pseudo-word prime, which suggests that the orthographic and the phonological gains from the prime do not have a lexical origin; they do not seem to be the consequence of activating a lexical representation. The conclusion is therefore the following: orthography is activated first, a phonological code is activated quite fast from it, and all this occurs at a pre-lexical level of processing.

The same conclusion was reached through a recent manipulation of phonological neighborhood. Yates, Friend and Ploetz (2008) used the same kind of methodology as Rayner *et al.* (1995), registering ocular behavior in reading for meaning. A sentence could accommodate both a word with many neighbors and a word with few neighbors, for example “The painful < sting / punch > made the man wince >. Shorter single-fixation and first-fixation durations were obtained for words with many neighbors, thus in fixation measures that are assumed to reflect early lexical processing, and there was no difference for total fixation time.

Consistency has also been manipulated. Ziegler, Montant and Jacobs (1997) found that words with multiple possible mappings from phonology to orthography produced longer lexical decision latencies than words with only one possible mapping. In the case of inconsistent words, the feedback from phonological to orthographic representations can be directed to the correct orthographic form but also misdirected to incorrect ones, creating competitors and therefore interference. In contrast, in the several priming paradigms, the use of phonological primes would lead to savings in the time that it takes for the target word to reach the critical recognitions threshold (as discussed by RASTLE; BRYSAERT, 2006). Given that in the masked situations the prime is not consciously perceived, one may think that the activation of sub-lexical phonological codes is automatic, not subject to strategic control.

The nature of these sub-lexical phonological codes will only be considered briefly. At the level of the letter there is little evidence of phonological involvement. Perea and Carreiras (2006) used nonwords created by transposing two letters (*relovución* from *revolución*) as masked primes in a lexical decision task. Two comparisons were critical. The effect of orthography was assessed by comparing < relovución — REVOLUCION > versus its phonological control < relobución (homophonic) — REVOLUCION >, and the effect of phonology was assessed by comparing this phonological control < relobución — REVOLUCION > with its orthographic control < relodución — REVOLUCION >. The first comparison yielded a significant 15 ms priming effect, while the second yielded a null effect (0 ms). Thus, letter priming, which is not completely position-dependent, activates orthographic codes, not phonological ones.

The same may not hold for the grapheme unit and is certainly not true for the syllable. Alvarez, Carreiras and Perea (2004), again using masked priming in lexical decision found that latencies to words with an initial CV syllable were faster, by 49 ms,

when primes (pseudowords) and targets (words) shared this syllable (ju.nas — JU.NIO) than when they only shared the initial letters but not the syllable (jun.tu — JU.NIO). In a further experiment they compared a “phonological-syllable (bi.rel — VI.RUS) with two control conditions (fi.rel — VI.RUS) and vir.ga — VI.RUS) and found shorter latencies for the phonological syllable, by 60 and 45 ms, respectively.

Before concluding with a general comment on the relations between the two lexical access systems and on the parallelism and its limits regarding the ways orthography influences spoken word recognition and phonology influences written recognition, it is worth mentioning that, for written words, as for spoken words, there are also influences from other sources of knowledge. The extent to which we interact with the words’ referents may be of some importance. We have a strong sensory-motor experience of the referent of, for example, mask, but a weak one of the referent of, say, ship. Interestingly, Siakaluk *et al.* (2007), who called this variable BOI (body-object interaction), found faster responses for high BOI words than for low ones, in both lexical decision and phonological lexical decision (“does it sound like a word?”). This suggests that there is semantic feedback within the lexical access system for written words, and that semantic knowledge is experience-based or action-based.

4. Towards a model of the two lexical access systems that is partially interactive and assumes asymmetrical interconnections

We have seen that the processing systems that lead from the auditory or visual stimulus to the recognition of a word should not be fully interactive. The surface representations that result from the earliest analysis in each of these systems must be highly modality-specific and autonomous. They are possibly, for spoken words, acoustic-phonetic or articulation descriptions, and, for written words, abstract identities of letters independent of case. They provide the input for specifically linguistic processing in the spoken and written language systems, respectively.

In these systems, the initial stage of processing is pre-lexical, in the sense that words are still not represented; it leads to segmental descriptions at various grain sizes, which form the basis for lexical access. It is at the upper, lexical processing levels, that words begin to be assembled or activated; their outputs are the selected lexical representations. It is also at these levels that several sources of knowledge, distinct from the stored intrinsic linguistic knowledge, in particular semantics and experience, can influence word recognition.

The systems of spoken and written language processing are not at all interconnected at the surface level. In the adult, skilled reader, they are symmetrically interconnected at the lexical access level, with orthography influencing the recognition of spoken words and phonology the recognition of written words. Symmetry is broken at the pre-lexical linguistic level, at which phonology influences the computation of sub-lexical orthographic units, perhaps through copies created for this specific purpose, but orthography does not influence the computation of sub-lexical phonological units.

In the beginning reader, this model is still not in place. What is common with the adult is the pre-lexical level in the processing of spoken language. It was installed long before the learning of literacy; it was then, and remains, encapsulated. But the pre-lexical level in the processing of written language is something that has to be learned under the supervision and systematic matching with phonology. As far as written words are mainly recognized through controlled decoding, this pre-lexical flow of information between the two language systems is dominant. When the orthographic lexicon begins to be accessed automatically, the pre-lexical flow of information between the two systems decreases, and phonological codes interact automatically with the orthographic ones in the access to written word representations.

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PAPERS

Language and Cognition

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Posling, UFC

Metaphor comprehension in foreign language

1. Introduction

Consider the following narrative published in The Guardian under the title “The tank driver” which shows how embodied experience helps the speaker to structure the description of what happened in his working environment:

John Nelson, 50, drives a petrol tanker. He earns £29,000 a year and lives with his wife in Cumbernauld, outside Glasgow. He has two adult children who have left home.

He says life has become increasingly difficult for manual workers over the years because all of the fun has gone out of work.

‘It is all about getting a pound of flesh from human beings. Businesses are all about profit and people feel much more stressed because of that. Years ago, most big organizations would have a social club, a football team, a pipe band. But that has all stopped. It is just work, work, work and no play.’

A ‘blame culture’ and the increasing use of short-term contracts have, says John, created a climate of fear and insecurity. ‘You can work all year doing an excellent job and no one will say anything, then you do one thing wrong and you’ll be crucified.’

John says long shift patterns, boredom, working in isolation and the plethora of health and safety regulations that have to be adhered to also create immense pressure. ‘I have learnt to switch on when I start work and switch off the minute I leave. But some of the other boys can’t.’ (The Guardian, 31.10.2004)

Nelson’s description of the businesses in terms of “It is all about getting a pound of flesh from human beings”, reveals how one domain of experience, that is the sensory-motor domain of PHYSICAL INJURY serves as a source for the metaphorical conceptualization of the perceptual domain of HARM, reflecting the primary metaphor

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HARM IS PHYSICAL INJURY, which motivation is the correlation between physical harm and affective response – unhappiness (GRADY, 1997), for instance. But do people infer this conceptual metaphor when understanding a creative expression, like “It is all about getting a pound of flesh from human beings” in this context? Our purpose in this article is to examine these questions from the overlapping, but not identical, perspective of research in cognitive linguistics and psycholinguistics.

Lakoff and Johnson (1980) posit that comprehension occurs through a conceptual mapping across domains. They propose a systematic mapping from a usually concrete source-domain to a more abstract target domain of experience. For instance, we understand the conceptual metaphor LOVE IS A JOURNEY because we have a systematically organized knowledge about the concrete conceptual domain of JOURNEY, and we rely on this knowledge in order to understand the target domain of LOVE. We comprehend and experience love in terms of a journey due to the fact that we follow a certain routine and conceptualize love metaphorically in terms of a journey when we experience it. Therefore, we use our daily experience with journeys to conceptualize love in terms of departure and arrival as expressed in the metaphorical expression “We have decided to *go separate ways*”. This example illustrates how love is conceptualized in terms of a journey, where the lovers correspond to the travelers and the relationship corresponds to the road traveled. Hence, according to the conceptual mapping view, metaphorical expressions derive from an underlying conceptual metaphor. Grady (1997) posits that primary metaphors link different concepts that arise from primary scenes and their correlations. The source concepts of primary metaphors have a content related to physical perception or sensation. For instance, when playing ‘hide and seek’, Brazilian kids give hints about the place they are hiding shouting ‘you are *hot*’ (FERREIRA, 2007). In that context ‘hot’ means close. This metaphorical utterance has as underlying conceptual metaphor PROXIMITY IS HEAT, which is a primary metaphor motivated by the basic perceptual experience of warmth, of being close to the mother’s body when we are born.

For cognitive linguists, language reflects some important aspects of our conceptual system which is motivated by embodied cognition (GIBBS, 2006). Systematic patterns of structure and linguistic behavior are not arbitrary but motivated by recurrent patterns of embodied experience reflecting our perceptual interactions, bodily actions and the manipulation of objects. Those patterns are experiential *gestalts*, known as image schemas which derive from our interaction when we manipulate objects or orient ourselves in space and time (JOHNSON, 1987). Some examples of those schematic structures are CONTAINER, BALANCE, SOURCE-PATH-GOAL, PATH, CENTER-PERIPHERY and CORRELATION. Things we consider as being of physical nature are usually something we conceptualize in terms of our bodily experience (LAKOFF; TURNER, 1989). Concepts like departure, journeys or cold are conventionally and unconsciously understood because they are linked to our embodied and social experiences. Gibbs and Ferreira (in press) empirical work provides evidence that conceptual metaphors are psychologically-real entities and play

at least some role in people's interpretation. Although cognitive linguistics research has faced many criticisms (MURPHY, 1997; HASER, 2005), due to its emphasis on language and on the linguist's individual intuitions, Gibbs (2007) considers cognitive linguistics evidence as the main theoretical and empirical support to the importance of embodiment for human cognition.

The main goal of the present study is to present empirical data in order to support the hypothesis that metaphor comprehension is based on English as a Foreign Language-learners' embodied experience. From a conceptual metaphor perspective, our hypothesis is that there is a universal pattern in the structuring of abstract concepts which facilitates metaphor comprehension in a foreign language in a similar way as it occurs in the mother language (GIBBS, 1994). Therefore, a metaphorical expression embedded in a sentence without context would be sufficient for Brazilian learners of English as a Foreign Language (EFL) to derive the metaphorical meaning of those metaphorical concepts with a strong bodily basis. We have also tested the comprehension of the same metaphorical expressions by American-English native speakers. We seek to investigate the degree of conventionality of the metaphorical expressions used in this study. For this purpose, we have carried out an empirical investigation using corpus linguistics methodology. Another goal of the present study was to compare the comprehension of different metaphorical expressions by EFL-learners belonging to four different English proficiency levels (pre-intermediate, intermediate, upper-intermediate and advanced), aiming at gathering some evidence for an evolution in the semantic acquisition of a foreign language. We would also like to argue in favor of the introduction of corpus linguistics methodology in psycholinguistics research.

Cognitive linguistics acknowledges certain language universals which result from general human cognitive processes, but it also emphasizes non-universal aspects related to the perception of language in its environment. Some of the major topics of research in cognitive linguistics are metaphor, categorization, polysemy, and prototypicality. They are regarded as belonging to the general organization principles related not to language alone but also to other areas of cognition (NIEMEIER, 2005). The investigation of linguistic phenomena relies on general organizing principles, and also relates language to culture. In this paper, we are going to review some important studies on polysemy and discuss its metaphorical motivation.

2. Polysemy

While homonym defines a word which has the same phonological representation and very different linguistic meanings, polysemy refers to words with a core, related meaning. For instance, the word 'ring' means the verb to call (in British English), but it is also the noun which stands for the round object people wear on their fingers. Both senses are unrelated and represent an example of lexical ambiguity, whereas polysemous words have similar, nearly indistinguishable senses, like 'talk' which

can mean 1. lecture (n), 2. discussion (n), 3. speak (v). One sense is certainly more prototypical, that is more representative than other senses, although those senses are systematically related (LAKOFF, 1987). A case of polysemy in Brazilian Portuguese is ‘ear’, which can mean the body part or the folded top part of the page of a book. It is not a mere coincidence that ‘ear’ means the folded top part of a page in a book and also the handle of a cup, since both have a shape which reminds us of a human ear and are therefore metonymically motivated. A conventional mapping within the conceptual system from body part concepts to these distinct objects can account for those cases of polysemy and reveals how those metaphoric meanings are motivated by our bodily experience. In the statement ‘The ball is rolling toward me’, the speaker could intend to designate (1) the ball people use to play soccer, but in a metaphorical sense he/ she could also be referring to in a metaphorical sense to (2) a person who is overweight and is walking in his/her direction. However, how does the listener arrive at the second intended meaning? Is it the case that listeners access both contextual and lexical information in a top-down and bottom-up process in order to disambiguate the meaning of an utterance? Does the reader access lexical or contextual meaning first, or both simultaneously?

In order to address these questions from a psycholinguistic perspective, we are going to review some relevant research on lexical access, the representation of polysemy and on the understanding of nonce sense, that is, an expression which has a sense for the occasion. Swinney and Cutler (1979) classify the selection of the sense of ambiguous lexical items as a post-access decision process which is not immediately affected by the semantic context. He argues that all meanings of an ambiguity are immediately and momentarily accessed even when the context is biased toward just one of the “senses” of the word tested. While Swinney and Cutler describe the understanding of ambiguous words through lexical access as a bottom-up enterprise, Clark (1983) proposes an intentional parser which works top-down as a general procedure for computing indirect uses of language. Clark argues that contextual expressions, which depend on moment-to-moment coordination between speaker and listener, are used to say things that could not be expressed in any other way. A traditional parser, which is designed to rely totally on the linguistic properties of the sentence and functions based on the sense-selection assumption, will fail to disambiguate nonce sense – like for instance a novel, creative metaphor_ due to the fact that it will probably select a literal paraphrase of the metaphor. However, a literal paraphrase of a contextual expression cannot reproduce all weak implicatures (SPERBER; WILSON, 1995) activated by this contextual expression. Clark points out that the ‘post-decision model’ is due to fail on contextual expressions because – when it encounters a nonce sense, like ‘dog’ in the utterance “I am close to being able to watch PG-13 movies,” said Yount, a *dog* who lives in San Francisco’s Outer Sunset and will turn 12 in December.” (San Francisco Chronicle, 29.02.2006), where *dog* refers to those people born in the year of the dog according to the Chinese zodiac tradition, the lexical rules will generate a large number of possible senses, and the

speaker will have to select among those possible senses for the noun 'dog' the most adequate to that specific context. Apart from memory load problems, another issue is how could this selection work? Although Swinney and Cutler (1979) claim that lexical access is an autonomous process in which sentence comprehension is not an interactive process, he posits that the semantic context acts during sense selection. In order to solve this methodological puzzle, Clark asks how intentional parsers can be made to work on a basis of the speaker's intended senses. Perhaps the framework of Relevance Theory (SPERBER; WILSON, 1995) can help to account for a way to select the most relevant meaning, that is the one which causes the most impact and hence generates more contextual effects, but it is also the meaning which demands less cognitive effort to be processed.

Another important issue concerns the representation of the intended polysemic senses. Are polysemous senses represented separately or do they have a core meaning? Klein and Murphy (2001) present findings that polysemous words have separate representations for each sense. In the authors' view, if they have a core meaning, the core meaning is minimal. The authors try to elaborate on a core meaning view more consistent with their results, which relies on temporary, episodic constructions of word senses according to which when a word like 'paper' appears in a specific context, a more detailed context-appropriate sense is constructed in the sentence representation. Once one has interpreted 'paper' to mean a daily publication of news, next time the word appears in the same context, the same sense can be more easily retrieved. The inhibition of a different sense could be accounted for on the basis of Sperber and Wilson's (1995) Relevance Theory. Only the most relevant sense, that is, the sense capable of reaching the most contextual effects on that context will be derived. Due to reasons of economy the other - less relevant sense in that context - will be discarded.

To sum up, a psycholinguistic theory of understanding should take into account the fact that expressions with a specific sense, which is context dependent, are ubiquitous. Common ground (CLARK, 1996), that is the set of mutually held beliefs and assumptions of interlocutors engaged in communication, plays an important role in solving ambiguity and in identifying the intended meaning of polysemous words. In spite of the relevance of studies like Swinney and Cutler's, which aim at shedding some light into the discussion about how and when do we select the most appropriate sense of an ambiguous word, in our view lexical access should not be seen as a context autonomous process independent of embodied motivated comprehension.

In the following sections, we are going to review some important contributions of cognitive linguistics to second and foreign language acquisition research.

3. Metaphor Comprehension in Foreign Language

The study of figurative language has raised growing interest in the area of applied cognitive linguistics. This might be due to the fact that metaphor, metonymy and idioms

are part of our daily language and posit a challenge for teachers in the foreign language classroom. The present study adopts a cognitive approach to foreign language learning and acknowledges the importance of learners' interaction with the environment, as well as the importance of the social context in learners' embodied cognition (GIBBS, 2006). Cognitive linguistics regards language as closely interacting with other mental faculties, such as perception, vision, memory and sensorial-motor skills.

Littlemore (2001a) claims that divergent thinkers, that is people who are able to solve problems requiring many possible answers where the emphasis is on the quantity, variety and originality of responses, are more likely to display metaphoric intelligence. She also argues that metaphoric intelligence probably also affects a learner's use of communication strategies (TARONE, 1983), that is the speaker's attempt to overcome gaps in the language system in order to communicate meaningful content. This is the case, for instance, when students use the strategy of word coinage and paraphrase. Word coinage is a strategy related to metaphoric extension, that is *when speakers use the words available to them in original or innovative ways in order to express the concepts they want* (LITTLEMORE, 2001b, p. 5). What is more, the use of metaphoric processes by native speakers recurring to words which they know to describe concepts for which they do not know the words is known to be one of the main strategies used by young children when acquiring their first language. Littlemore points out that lexical innovations made by children in their first language are similar to the word coinage strategies which second language learners resort to when trying to find solutions for knowledge gaps in the second language. Paraphrase often involves metaphorical analogy which can result in striking images, as the description made by second language learners - they actually used a simile - of a seahorse as 'a sea animal with a chicken on its head' or 'a sea animal which head is like a punk'. Littlemore concludes that by using those strategies, metaphorically intelligent language learners can use their language resources to express many more concepts, being able to enhance fluency and communicative success. Her arguments basically highlight people's cognitive ability to comprehend metaphoric language.

In a study with English, as a Second Language, learners of Business English, Littlemore (2003) investigated how the use of images related to the conceptual metaphor could help students understand the meaning of metaphorical expressions. Littlemore uses the expression 'metaphoric competence' to refer to the ability of ESL-learners to understand novel metaphorical expressions in the second language. Littlemore points out that mistaken interpretation of metaphorical expressions occur when learners attribute different meanings to the source-domain of the metaphor than those originally intended by the speaker. According to the author, ESL-learners tend to perceive contextual clues which are closer to their cultural expectations.

Another author who pointed out pedagogical implications of conceptual metaphor research with second language learners is Charteris-Black (2000). Charteris-Black argues that *teaching the language is, at least in part, teaching the conceptual framework of the subject* (*ibid*: 150). His research aims at revealing the implications

of conceptual metaphor theory for a content-based approach to the teaching of lexis for English for Specific Purposes (ESP) learners from an Economics background. Charteris-Black used corpus-based analysis in order to compare the relative frequency of metaphorically motivated words, taken from a corpus of *The Economist* magazine, with some words in the general magazine section of the Bank of English. The author illustrates how the economist is shown in the corpus as a doctor who can take an active role in influencing economic events. He also demonstrates how the use of some animate metaphors in the corpus implies some potential for control, while the use of inanimate metaphors implies the absence of control.

Charteris-Black (2000) claims that vocabulary lessons which teach these metaphors could enhance the understanding of central concepts for economics students. He suggests that knowing the metaphors through which impersonal concepts are conceptualized *seems a valuable addition to content-based ESP approaches* (*ibid*: 164). Those findings have implications for the present study. In the next section, we are going to report on the experiments.

4. Experiment 1: metaphor comprehension tests with Brazilian EFL Learners

Ten novel metaphorical expressions were selected from online editions of American and English newspapers. After that, the underlying conceptual metaphors were identified based on the metaphor inventory presented by Lakoff and Johnson (1980, 1999) and Grady (1997). Regarding the difficulties that texts containing metaphorical expressions posit to foreign language learners, we seek to investigate what sort of knowledge do EFL learners employ when trying to comprehend a metaphorical expression in a foreign language. In order to investigate this, we examined how subjects comprehend metaphorical expressions with and without a context.

4.1 Method

Participants. The sample comprised 221 Brazilian undergraduate students, Brazilian Portuguese native speakers and learners of English as a Foreign Language, aged 16 to 67 years-old.

Materials. We generated a lexis test of the metaphorical expressions, which aimed at investigating if subjects really understood the lexical item, that is, when they marked that they knew its meaning, subjects were asked to write it down.

We have also formulated two multiple choice tests: one test containing only the ten selected metaphorical expressions and another one containing the same expressions embedded in a short context. Each question had four answer options: the correct option corresponded to the underlying conceptual metaphor of the metaphorical expression in the question. The order of the questions, as well as the order of the options was randomized in both questionnaires.

Procedure and design: In the first sitting, subjects responded to the reading part of a validated proficiency test, in order to classify them in four different proficiency

levels (pre-intermediate, intermediate, upper-intermediate and advanced). We opted to discard subjects with a basic level of English. Having answered the proficiency test, subjects received the lexis test.

In the second sitting, subjects responded both metaphor comprehension tests. The data collection questionnaires were applied to groups of about 40 subjects each time in the two sittings.

4.2 Experiment 2: metaphor comprehension tests with American English native speakers

Our goal here was to examine the degree of conventionality and the degree of familiarity of those ten metaphorical expressions according to the intuitions of American English native-speakers.

4.2.1 Method

Participants: Sixteen American English native-speakers, undergraduate Psychology students at University of California, Santa Cruz took part in the experiment.

Materials: The experiment used the same ten metaphorical expressions employed in Experiment 1. We formulated three questionnaires in order to ask subjects intuitions on how well they understood each metaphorical expression, how common those metaphorical expressions are and if the speaker would ever use those expressions.

Procedure and design: For the experiment, each participant was given a booklet which contained the instructions and the experimental materials. Participants were specifically instructed, “Please rate each item on a 1 to 7 scale to answer if you understand what those utterances mean from 1 (= not at all well) to 7 (= very well). Write down the number reflecting this (1-7) in the column on the right of the utterances.” Subjects were encouraged to use all portions of the rating scale in making their judgments. The experiment took about 20 minutes to complete.

We analyzed the data by calculating participants’ mean ratings for each type of stimuli.

4.3 Using corpus linguistics methodology in metaphor research

The main goal of this study was to compare the results of both psycholinguistic experiments with empirical evidence from corpus linguistic research. A corpus based research allows us to identify patterns of language use faster than the use of intuition or the analysis of isolated texts to the extent that words or expressions are automatically retrieved from the corpus and classified. Deignan (2005) argues that a corpus linguistics approach can make a substantial contribution to our understanding of metaphor. Research using empirical methods in order to explore metaphor data in a corpus (BOERS, 1999; CHARTERIS-BLACK, 2000) reveal that metaphorical language used in natural contexts is very different from the metaphorical data collected through introspection. Therefore, we believe that the use of corpus linguistics methodology can contribute to a less subjective analysis of metaphorical expressions.

Corpus linguistics is in the search of typical linguistic patterns. In the case of metaphor research, the main interest focus of corpus linguistics is conventional metaphor (DEIGNAN, 2005). Deignan considers any sense of a word found less than once in thousand words as being an innovative or rare use. Although the corpora might be limited, they offer natural occurring data, whereas the alternative would be data derived from the speaker's own intuition, a methodology commonly used in cognitive psychology (GIBBS, 2007).

The register of the number of occurrences of each metaphorical expression on the web is relevant in order to establish a comparison based on the reality of use of written language, such as the result of the corpus research carried out on the web using the WebCorp tool², compared to the data collected with American English native speakers in the psycholinguistic experiment. For the corpus linguistics research presented here, ten metaphorical expressions selected from English and American online newspapers were used³. Those expressions were included in the psycholinguistic experiment. According to the metaphor analyst's intuition, five expressions used in the study were classified as conventional metaphorical expressions, whereas five expressions were classified as novel metaphors, that is extensions of conventional metaphors, considered creative and innovative uses (LAKOFF; TURNER, 1989).

5. Results and discussion

The results of both tests were verified through variance analysis (ANOVA). We considered a significance level of $p < 0.05$ in the analysis. The difference between the different levels of proficiency (pre-intermediate, intermediate, upper-intermediate and advanced) is significant only between the pre-intermediate and the intermediate level, as appears below:

Reading proficiency level	Subjects (N)	Test with metaphors out of context (1)	Test with metaphors in context (2)
PI	60	6,6	
I	79		7,6
U	62		7,7
A	20		8,4

Figure 1: Comparison scores in the metaphor test according to the reading proficiency level

² WebCorp (www.webcorp.co.uk) was created and is maintained by the Higher School of English at University of Central England, Birmingham. Access is free.

³ The use of texts selected among different subjects, such as fashion, sports and politics, taken from Anglo-American newspapers as *The New York Times*, *The International Herald Tribune* and *The Guardian* is justified by the main goal of the study, which is to investigate metaphor comprehension from a Conceptual Metaphor (LAKOFF; JOHNSON, 1980, 1999) perspective. Lakoff and Johnson claim that metaphor is ubiquitous.

There is a significant correlation ($p < 0.05$) between the previous knowledge of the lexis which is part of the metaphors and the scores of the reading proficiency test answered by the participants. This data corresponds to our expectations since the previous knowledge of the lexis seems to facilitate reading.

In order to analyze the scores per metaphor separately, we chose a population of 50% of the sample of 221 subjects and carried out a planned t-test. The t-test pointed out that there was no difference between this sample ($N = 118$) and the total sample ($N = 221$), since the results did not reveal a significant difference ($p > 0.05$). We chose at random 118 participants among the four proficiency levels (pre-intermediate, intermediate, upper-intermediate and advanced), in order to examine the distribution of the scores per metaphor, comparing the results of the questionnaire containing the metaphors without and with a context.

According to this analysis, there was a high score in the questionnaire without a context for the metaphors (1) It is all about getting a pound of flesh from them, which correct option had a score of 93 ($T=118$), compared to a score of 71 in the questionnaire containing the metaphors in context; (3) Somebody was trading the keys to the kingdom, which right option had a score of 91 ($T=118$), compared to a score of 54 in the questionnaire containing the metaphors in context; (4) You are in the middle of a dark forest, which right option had a score of 116 ($T=118$), compared to a score of 75 in the questionnaire containing the metaphors in context; (6) The temperature went from boiling to subzero, which right option had a score of 103 ($T=118$), compared to a score of 98 in the questionnaire containing the metaphors in context; e (7) I was at the edge of my limit, which right option had a score of 115 ($T=118$), compared to a score of 68 in the questionnaire containing the metaphors in context. In case of the metaphorical expressions (4) You are in the middle of a dark forest, (7) I was at the edge of my limit and (10) It disappeared two months later in quick rotation, which right option had a score of 109 ($T=118$), compared to a score of 101 in the questionnaire containing the metaphors in context, the fact that the metaphorical expression in Portuguese was the literal translation of the metaphorical expression in English has certainly biased the results. However, further research is needed here in order to confirm it.

We would like to focus the discussion on the results of items (6) and (8) of the questionnaire which raises interesting questions from a methodological point of view concerning Conceptual Metaphor Theory. In question (6), The temperature went from boiling to subzero, the right option ‘the situation changed quickly’ has as underlying primary metaphor CHANGE IS MOTION (GRADY, 1997, p. 286). In the analysis of the score per metaphor, the right option was rated with 103 ($T=118$), compared to a score of 98 in the questionnaire containing the metaphors in context. In question (8) Somebody has managed to sneak into their hearts, the correct option ‘to find an important spot’ had as underlying primary metaphor IMPORTANT IS CENTRAL.

Our hypothesis is that the same pattern at work in the comprehension of metaphorical expressions in the mother tongue (GIBBS, 1994) is also at work when

the language learner reads a metaphorical expression in the foreign language. Such hypothesis suggests the existence of a universal pattern in the structuring of abstract concepts which facilitates metaphor comprehension also in the foreign language. This universal pattern allows learners even at pre-intermediate proficiency level to comprehend metaphorical language based on their embodied cognition, that is, it enables learners to understand metaphorical expressions without relying on contextual information. For instance, in case of the expression the temperature went from boiling to subzero, the option corresponding to the underlying conceptual metaphor CHANGE IS MOTION (GRADY, 1997, p. 286), which is ‘the situation changed quickly’, obtained a high score in the questionnaire without context. However, only a thorough study of the inferences related to each conceptual metaphor tested in the study will gather more evidence on the comprehension of those metaphorical expressions.

5.1 Results of the search using corpus linguistics methodology

We chose to use WebCorp, which is a tool with examples of language use extracted from the web in an adequate form for linguistic analysis. WebCorp has been developed to operate using the available search tools and it uses Google – among other tools in order to locate relevant sites on the web. WebCorp accesses each of these pages and extracts lines of concordances. The result of the WebCorp search on the number of concordances for the studied metaphorical expressions follows below.

Table 1: Results of the WebCorp⁴ search

Metaphorical expressions	Accessed pages	Number of concordances	Literal use of the expression	Metaph. Use
<i>To get a pound of flesh from human beings.</i>	75	58	2	56
<i>To bump its premium subscribers up to a virtually unlimited capacity.</i>	9	7	-	7
<i>To trade the keys to the kingdom.</i>	36	23	3	20
<i>You are in the middle of a dark forest.</i>	134	99	90	9
<i>... the most recent season of corporate financial manipulations has as its latests storms.</i>	5	5	-	5
<i>The temperature went from boiling to subzero.</i>	1	1	-	1
<i>I was at the edge of my limit.</i>	14	12	-	12
<i>It has managed to sneak into their hearts.</i>	7	7	-	7
<i>It exploded onto the radar.</i>	6	6	-	6
<i>It disappeared later in quick rotation.</i>	54	33	25	8

⁴ Accessed in 13.09.2006.

The specificity of the employed linguistic search tool allowed an increase in the number of concordances for seven of the ten studied metaphors⁵. The WebCorp search revealed that the following metaphorical expressions (1) *To get a pound of flesh from human beings*; (2) *To bump its premium subscribers up to a virtually unlimited capacity*; (3) *To trade the keys to the kingdom*; (5) *...the most recent season of corporate financial manipulations has as its latest storms*; (7) *I was at the edge of my limit*; (8) *It has managed to sneak into their hearts*; (9) *It exploded onto the radar* present mainly metaphorical uses.

Expressions as (6) *The temperature went from boiling to subzero* and (7) *I was at the edge of my limit*, which judgement of the EFL-learners had a score of 103² for (6) in the instrument without context and a score of 115 for (7) under the same conditions, obtained a very different result in the psycholinguistic experiments and in the corpus linguistic research. The expression *The temperature went from boiling to subzero* (6) generated only one concordance in WebCorp, which was a metaphorical use, and expression (7) *I was at the edge of my limit* generated twelve concordances, all of them metaphorical uses.

The result of the corpus search on the web using WebCorp revealed that the ten linguistic metaphors used in the study are novel metaphors with a low number of concordances. According to Deignan (2005), each sense of a word found less than once in thousand occurrences of a word can be considered of rare use. The expression which received the highest number of concordances with metaphorical sense in the WebCorp search was (1) *To get a pound of flesh from human beings* with 58 concordances, of which 56 were metaphorical uses. The result of the tests carried out with EFL-learners revealed that 93 out of 118 subjects related this metaphorical expression to its underlying conceptual metaphor HARM IS PHYSICAL INJURY in the questionnaire without context. Apparently, the context did not help subjects to comprehend this linguistic metaphor. Hence, the opposite seems to have happened and the EFL-learners scored more distractor options in the test after reading the linguistic metaphor embedded in a context. Such a result points out a problem of the psycholinguistic experiment, since one of the goals of the empirical study with EFL-learners was to test five novel and five conventional metaphorical expressions, and we have finally found out that all metaphors tested in the study are novel metaphors according to the results of the WebCorp search.

6. Discussion

We could state that the foreign language learners who participated in the experiment have a ‘metaphoric competence’ (LITTLEMORE, 2003) which enables them to derive metaphorical meaning in a foreign language. Some of the mistaken metaphorical interpretations by the foreign language learners in the present study

⁵ A preliminary study was carried out using Google – advanced search, with a sample of 118 ss.

occurred, as suggested by Littlemore, when the EFL-learner attributed another meaning than the one originally intended by the author, to the source-domain of the metaphor.

In case of the metaphorical expressions (4) *You are in the middle of a dark forest*, (7) *I was at the edge of my limit*, (9) *It doesn't often explode onto the radar* and (10) *It disappeared two months later in quick rotation*, it is also possible that the literal translation of the metaphorical expression into Portuguese has biased the results because it is similar to the metaphorical expression in English. Nevertheless, the underlying conceptual metaphors in (4), (7), (9) and (10) relate to bodily experiences which can be easily perceived by our senses, such as vision and the feeling of anger. Therefore, the high score of the questions related to those metaphors in the questionnaire without a context may also be an evidence for embodiment (GIBBS, 2006). Those conclusions about the scores of questions (4), (6), (7), (9) and (10) are in line with Charteris-Black's (2003) findings that metaphorical language, which has a similar linguistic form and conceptual basis in the mother (L1) and foreign language (LE), are more easily understood by foreign language learners.

In the study carried out with American English native speakers, the ten metaphorical expressions were presented in a sentence to respondents, that is the expressions were not embedded in a discursive context. This questionnaire was similar to the first questionnaire applied to the foreign language learners. The results showed that the judgment of the American native speakers was similar to the ratings of the English as a Foreign Language learners for the metaphorical expressions (4), (5) and (6). Expression (4) *You are in the middle of a dark forest* received a high score in the empirical study with EFL-learners (116 out of 118 respondents scored 'danger' in the questionnaire without a context), relating danger to darkness. The same expression was considered easy to comprehend by American English native speakers. However, expression (5) *...the most recent season of corporate financial manipulations has as its latests storms* was rated as average by the American English native-speakers (rated with 3,8 out of 7 on a Likert scale). Many EFL-learners did not relate this expression to the underlying conceptual metaphor in the multiple choice task (79 of 118 respondents scored the option related to the conceptual metaphor in the questionnaire without a context). English native speakers rated expression (6) *The temperature went from boiling to subzero* as easy to understand (6,7 of 7). However, we did not check what they really understood under that expression. EFL-learners scored 102 (in a 118 sample) for the same question containing the metaphorical expression in a sentence. A later study (FERREIRA; MACEDO, 2009) has pointed out that EFL-learners access both possible underlying conceptual metaphors (CHANGE IS MOTION and INTENTION OF EMOTIONS IS HEAT).

7. Final remarks

The results of the three empirical studies present evidence, which corroborates the hypothesis of the universality of metaphor and the role of embodiment on the

comprehension of metaphorical expressions from a cross-linguistic perspective. An analysis of the answers of the group of EFL learners for the questionnaire presenting the metaphorical expressions without a context showed high scores for the following metaphorical expressions: (1) *To get a pound of flesh from human beings*, (3) *To trade the keys to the kingdom*, (4) *You are in the middle of a dark forest*, (6) *The temperature went from boiling to subzero* and (7) *I was at the edge of my limit*. This result is similar to the result of the ratings for same metaphorical expressions obtained with the group of American English native speakers, which rated expression (4) *You are in the middle of a dark forest* with 5,7; (6) *The temperature went from boiling to subzero* with 6,7 and (7) *I was at the edge of my limit* also with 6,7 on a rating scale from 1 to 7, in which 7 corresponds to an excellent understanding of the expression.

The data resulting from both psycholinguistic experiments present some evidence which corroborates the hypothesis that there is a universal pattern in the structuring of abstract concepts which facilitates metaphor comprehension in a foreign language. This universal pattern enables foreign language learners to comprehend linguistic metaphors without contextual information, since the variable context did not play a significant role in metaphor comprehension in the present study. Considering the results of the first experiment for the four different proficiency levels from a foreign language acquisition perspective, there is only a significant improvement in metaphor comprehension above the intermediate proficiency level.

A comparison of the results of the psycholinguistic experiments with the study which employed corpus linguistics methodology revealed that speaker's intuitions on their linguistic knowledge are not always in line with the data of language in use presented in the corpus. In this sense, corpus linguistics can be regarded as a supporting methodology for psycholinguistic research. Therefore, we strongly recommend introducing corpus linguistics methodology as a tool in the design of data collection questionnaires for psycholinguistic research.

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Conceptual structure and subjectivity in epistemic constructions

1. Introduction

Recent work on Cognitive Linguistics has claimed that constructions carry meaning, independently of the words in the sentence. That is, it is argued that form-meaning correspondences exist, independently of particular verbs (GOLDBERG, 1995, 2006).

In this vein, this work takes a cognitive approach to Brazilian Portuguese Epistemic Constructions (hereafter, EC), focusing on the association of syntactic parameters and specific meaning configurations related to subjective perspective (LANGACKER, 1987, 1991).

The paper is organized as follows. Section 2 presents some basic assumptions in Cognitive Linguistics; section 3 analyzes specific instantiations of EC in terms of subjectivity. Finally, section 4 discusses the speaker's motivations for using subjective epistemic constructions in interaction.

2. Conceptual structure and subjectivity

One of Cognitive Linguistics basic assumptions is that language's main function is to prompt some clues as to how the mind works. From this perspective, semantic analysis is based on conceptualization, mental experience and cognitive processing. As Langacker (1987, p. 99) puts it, "semantic structure is conceptualization tailored to the specifications of linguistic convention".

It is assumed that speakers may construct the same scene in alternate ways, based on parameters such as orientation, vantage point and subjectivity. As for subjectivity, Langacker (1990) distinguishes three situations:

- a. The *ground* (the speech event, its participants and immediate circumstances) is external to the sentence semantics; in this case, there is no subject of consciousness present. E.g. 1: The neighbors are in Paris.
- b. The *ground* is included in the scope of predication, as a secondary reference point. This is the case of deictics, such as *yesterday*, *tomorrow*, etc, which take the moment the speaker utters the speech act as a reference point. Another example is the use of modal adverbs, which refer implicitly to the speaker as the source of judgment. E.g. 2: The neighbors are probably in Paris
- c. The *ground* is profiled, taking part in the situation which the sentence refers to. E.g. 3: I think the neighbors are in Paris.

With respect to the possibilities listed above, Epistemic Constructions are included in situation “c”, in which the *ground* is profiled (as illustrated in e.g. 3).

2. Epistemic constructions

The speech data used in the analysis originated from 3 hours of transcribed conversational interactions among participants of the TV show “Big Brother Brasil I”, broadcast by Brazilian television (ROCHA, 2004). The analysis indicated that 88% of EC display first person singular subjects and present tense epistemic verbs, as follows:

(1) Generic Schema:

[[1^a ps Vepist (pres.) [Comp S]]

1a. ps (main clause subject) = 1st person singular

Vepist (pres.) – main clause verb = present indicative epistemic verb

Comp = complementizer “que”

S = subordinate clause

The generic schema above may be instantiated as follows:

- (2) Eu acho que é cada vez maior o acesso a produtos semiprontos ...
 I think:pres:1ps that is each time bigger the access to products semi-ready ...
 ...ou prontos.
 ...ou ready.

“I think that the access to semi-ready or ready products is increasing”

- (3) Eu sei que ele bebeu muito ontem.
 I know:pres:1ps that he drink a:lot yesterday
“I know that he drank a lot yesterday”

It is worth noting that examples (2) and (3) would be acceptable if the epistemic verbs were not made explicit, as shown in (2') and (3') below:

- (2') É cada vez maior o acesso a produtos semiprontos ou prontos.
 be:pres:3ps each time bigger the access to products semi-ready or ready
“The access to semi-ready or ready products is increasing”

- (3') Ele bebeu muito ontem.
 He drank: past:3ps a: lot yesterday
“He drank a lot yesterday”

The guiding hypothesis for the analysis of cases like (2) and (3) is that they are not interchangeable with examples (2') and (3'); it is assumed that (2) and (3) reflect subjective perspective and prompt specific aspects of pragmatic meaning, which are socially and interactively negotiated.

In (2), the speaker is put in prominence, and takes part in the scene to which the sentence refers. The fact that “*access to semi-ready or ready products is increasing*” is not framed as something out there in the world, but as a fact on the world, as it is observed by the speaker; analogously in (3), the observation that “*he drank a lot yesterday*” is framed as the speaker’s evaluation of some real situation. Both cases characterize what Langacker (1987, p. 130) called “egocentric viewing arrangement”, which is based on the expansion of the objective scene in order to include the observer and the speech event immediate circumstances, as shown in Figure 1 below:

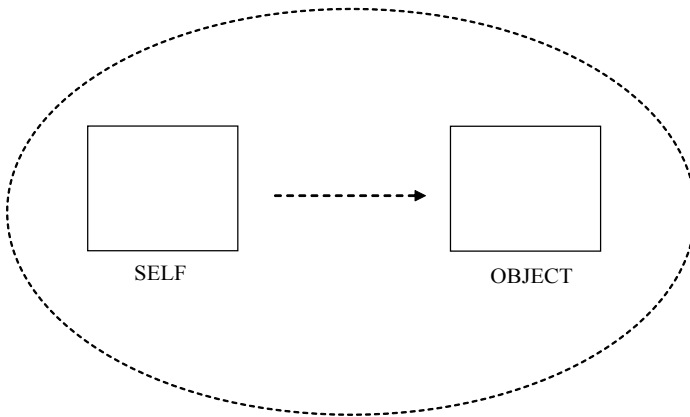


Figure 1: Egocentric Viewing Arrangement.

On the other hand, sentences (2') e (3') are cases of “optimal viewing arrangement” (LANGACKER, 1987, p. 129), by which the observer and the object observed are totally distinct, and the speaker is not aware of his role as an observer. The following diagram illustrates this situation:

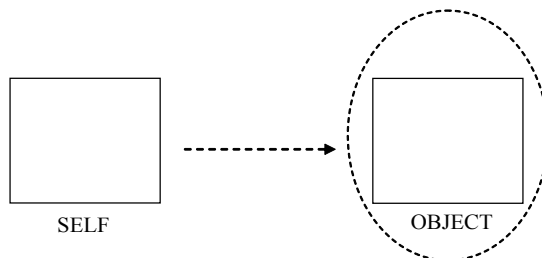


Figure 2: Optimal Viewing Arrangement.

In the representation above, the scene is maximally objectified: the object is prominent, and the speaker’s observation is not focalized.

3. Subjective and interactional motivations

From an interactional perspective, the question one could ask is: why would the speaker embed some specific assertion in an epistemic clause, and not produce the assertion as an independent clause?

Data analysis suggested that two main motivations may be at issue here: one related to alignment with other participants, and the other to non-alignment. In the latter case, the speaker highlights his/her own perspective as different from the perspective of other participants; in the former, the speaker presents his/her perspective as coincident with some previous assertion made by others.

The following example illustrates a subjective motivation for the contrastive use of an EC. It takes place during a conversational interaction in which participants comment on their different reactions to crying:

(4) ANDRÉ: [ah eu queria ter um chorinho discreto' queria mermo.
Ah I would like to cry quietly, I really would.

ESTELA: se eu tiver vontade de chorar'e eu não choro' eu acabo ficando doente.
If I feel like crying and I'm not able to cry, I become sick.

VANESSA: não' eu tenho um choro bem controlado' eu num gosto de' num gosto porque **eu acho que eu já chorei muito' a vida inteira'** então eu agora eu se eu segurar a onda ficar engolindo passo mal' dói muito' é uma coisa que tem que reaprender' tem que reaprender a chorar agora.
no, I take control over crying' I don't like (it) because I think I've cried all my life so now if I try to take control over it, I feel bad, it hurts' it is something that I have to learn again' I have to learn to cry again now.

In the example above, Vanessa takes a different position from André and Estela with respect to crying. While the other two participants admit that they cry a lot, Vanessa recognizes that it is not easy for her to cry. The EC occurs when she tries to explain the motivation for this difficulty: "*Eu acho que eu já chorei muito a vida inteira*" (*I think I've cried a lot all my life*).

On the other hand, the motivation for using an EC when there is some kind of alignment between the speaker and the addressee's assertions can be illustrated in the following segment:

(5) VANESSA: aqui eu tô descobrindo que é uma coisa muito gostosa que é cantar.
I've been finding out here that singing is something very delightful.

ANDRÉ: nossa mas cantar gente, acredite nisso que eu falo isso é meu lema é o lema da minha vida, cantar é um direito da se/ é um direito seu, eu não esquento nem minha cabeça se pessoa canta mal se a pessoa canta bem.

God, but singing, believe me, this is my motto, this is the motto of my Life, singing is your right, I don't mind if the person sings badly if the person sings well.

VANESSA: **eu sei que eu canto mal mas,**
I know I sing badly but,

ANDRÉ: [eu num tô nem aí.
I don't care.

VANESSA: é uma coisa que eu quero aprender.
It's something I wanna learn.

In the example above, Vanessa aligns herself with one of the options opened by André; she asserts “*Eu sei que eu canto mal*” (*I know that I sing bad*) immediately after André says “*Eu não esquento minha cabeça se a pessoa canta mal, se a pessoa canta bem*” (*I don't mind if the person sings badly, if the person sings well*). We may conclude, then, that Vanessa makes a subjective assertion (*Eu sei que.../I know that...*) aligned to what was previously said in the interaction.

4. Conclusion

Cognitive Linguistics approach to grammatical constructions predicts that different syntactic structures are always related to different organizations of conceptual structure. Following this axiom, it was argued in this paper that different conceptual relations between Observer/Object can be expressed through Independent Assertive Constructions (optimal viewing arrangement) or through Epistemic Constructions (egocentric viewing arrangement).

The analysis of conversational data has shown that the main motivation for the choice of Epistemic Constructions over Independent Assertive Constructions is interactional. In general, the speaker makes his/her subjective perspective explicit in order to show either alignment or non-alignment to a previous assertion made by other participants during the conversation.

It is worth noting that different types of epistemic verbs which occur in EC can be distributed along a scale of inter-subjectivity. For example, “I know that...” seems to presuppose that the information in the subordinate clause is available for both speaker and addressee, while “I think that...” restricts the subordinate clause information to the speaker cognitive space. It is hoped that future research may shed light on this issue.

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Cognitive linguistics, didactics and stereotypes

1. Introduction

In this contribution focusing on *cognitive linguistics* and *didactics* we reflect the concept of a *stereotype*. We want to show how cognitively oriented linguistics could be inspirational for a didactics of mother tongue. Inspiration is not just one-sided, especially if we consider cognitive linguistics and didactics in their wider social and cultural contexts. We create our stereotypes in the framework of a given linguistic community that is bounded by its own culture, communicated to us largely through education. That is why paedagogics, that is concerned with upbringing and education, is an inspirational discipline for cognitive linguistics. Our goal is the *comparison of the concept of stereotype* from following two points of view. First “*cognitive linguistics* and second” *didactic approaches*.

In our work we present a new view “from the viewpoint of specialised anchoring a transdisciplinary view” of mother tongue teaching. In question is one of the possibilities of cognitive viewing of the mother tongue “the Czech language” at school. We try to present the fundamental cognitive starting points in a way that would make it clear how to apply them to didactic practice.

2. Cognitive Linguistics

Cognitive linguistics (this understanding we accept from the conclusion of the monograph by Vaňková *et al.* (2005) and Vaňková (2007) “in contrast to the structural approach that treats linguistic expressions as intersections of relations in a system, and to the communicative approach that stresses the pragmatic dimension communication, pays attention to relations between words and reality, between language and world. It realized in a complicated way through the human mind (VAŇKOVÁ, 2007). Language is part of cognition and knowing, it has a share in how we understand the world, how we categorise it, what picture of the world we create for ourselves and how we pass it on. In this understanding language is the substance of our thinking, of our knowledge of the world and our orientation in it, and not only a means of communication. Teaching thus directed reveals the fundamental postulate of cognitive linguistics “*How, as Czech speaking and thinking people, we create for ourselves Czech linguistic picture of the world.*”

One of the central concepts of cognitive linguistics, especially from Poland, from which we proceed is the concept of the *linguistic world picture*. The fundamental thesis

of the linguistic world picture can be expressed like this: every language presents a specific interpretation of the world, shared by a certain community. We present an analysis of a small part of the linguistic picture of the world. We are focusing on the picture of the Czech school through the mediation of the linguistic picture of the “student” (partly also the teacher) in Czech. On the basis of texts (literary and specialised) we examine the way the principal participants of the upbringing and educational process assess one another, how they approach one another, what picture they form of themselves. A valuable source of information is also the cognitive definition of the word “student”, to which we have come through a questionnaire aimed at groups of students of Faculty of Arts. Our findings we shall support by particular examples.

3. Definitions of stereotypes

Cognitive definitions of words arise on the basis of *stereotypes*, which are linguistic-cultural pictures of objects and phenomena of our world. The essence of cognitive definitions are typical properties of objects that we consider customary and representative. While *lexical definitions* are based on objective, verifiable properties, cognitive definitions are based on inexact subjective generalisations. These generalisations relate only to typical, customary objects / phenomena, and not to all that one denomination can comprise. This approach to the vocabulary applies to normal everyday communication, to artistic texts, publicity and folklore texts; various clichés and phraseologies are based on it. Popular etymology and so-called folk psychology testify to cognitive definitions.¹

A stereotype, as defined by cognitive linguistics, represents a schematic one-sided “picture in the human mind”. By means of stereotypes we categorise, i.e. form groups, sort things / phenomena on the basis of some common feature. We categorise and sort in order to orient ourselves in the world. Categorisation based on stereotype differs from the Aristotelian concept. Decisive for it are, on the one hand, our personal experience and, on the other, the historical experience of our entire nation. Essential for it is the context in which we encounter the given object / phenomenon most frequently.

Even though different aspects of the “stereotype” are emphasised in different disciplines, their essence is the same. It is linked by the established conventionalised and accepted properties of the objects / phenomena / activities / happenings. This is not the original meaning of the word, but a metaphorical one.

¹ Popular etymology and folk (popular) psychology are linked by man’s tendency to interpret something unfamiliar, “non-transparent”, by means of something that he has encountered before, something that is close to him and that, on the basis of his experience and knowledge of the world, is connected. These connections are often mistaken, but largely shared within one linguistic community. In the case of popular etymology we are dealing with a wrong explanation of the meaning of words, in the case of folk psychology with a layman’s explanation of the human psyche.

The Czech etymological dictionary – Rejzek (2001) states that the word “stereotype” comes from Greek *stereós* – firm, hard – and *týpos* – blow, mould, form, character, i.e. a firm form. The metaphorical meaning – a customary, established way of doing something – is derived from its specialised meaning – a printer’s block cast as a whole from the typesetting.

Most explanatory dictionaries and dictionaries of foreign words give the basic meaning in agreement with the Etymological dictionary – i.e. a printer’s block. Further meanings listed are: an established automatic notion, a simplified worn-down concept, a single-shaped sequence of something; an established customary manner of reacting to something or performing something in a certain regular sequence. This meaning comprises, on the one hand: a continuously repeated work task and, on the other, the ways in which certain ethnic groups, nations, races, groups of inhabitants perform judgements on the basis of their traditions and prejudices of themselves (autostereotype) or others (heterostereotype), (SCS, 1981, p. 697).

Pedagogy offers the following definition: an automatized fixed order of actions which requires no detailed thinking from the person doing it, tracing the quality of an action and evaluating its fruitfulness. Always acting in the same way, promptly, accurately, economically, often unconsciously. This may concern motion, speech and mental activities (PRŮCHA; WALTEROVÁ; MAREŠ, 1995).

This so-called dynamic stereotype, which focuses on the aspect of action, is appropriately connected with the so-called statistic stereotype, which proceeds from typical features. Considering the way in which students perceive their teachers, i.e. what is the teacher’s stereotype from the students’ point of view, it seems natural to examine what kind of teacher he is and what kind he should be.² The first one is “popularly speaking” usually connected with diagnosis, the second one with personality. Stereotype as a linguistic-cultural picture reveals the teacher’s characteristics that we can arrive at by subjective generalization. It is formed in the Czech environment by characteristics such as: despotic, authoritative, mean, superior, hysterical, hung up, poor, absent-minded, funny, strict, just, wise, pleasant, educated, friendly, outgoing, sociable... (for a teacher’s stereotype in work see Macounová, 2005). We can learn more from the students about many other characteristics forming the teacher’s stereotype. Typical characteristics of teachers, especially of women, are also described in commonly shared texts such as anecdotes, works of fiction, movies etc. In the same way we could concentrate on the teachers’ approach to the students that is often formed based on stereotypes (about rigid pedagogical approaches see below).

² Stereotype as a picture and stereotype as a model are described in the study by Bartmiński and Panasiuk (2001).

4. Cognitive Linguistics and didactics

Because we are concerned with the relationships of cognitive linguistics and paedagogics, more specifically the *didactics of the mother tongue*, we must mention the subject of the study of those “non-linguistic” disciplines is often defined as the discipline concerned with education and upbringing. Didactics is one of the paedagogical disciplines, concerned with the problems of teaching. The specific problems of teaching individual subjects are the concern of specialised didactics. In our article we focus on the didactics of the Czech language, though we cannot disregard its broader paedagogical frame. Mother tongue has an important upbringing and educational function. The didactic of Czech language is two-sides discipline: in terms of pedagogical practical training it seems to be a method of instructions, whereas the part which intermediates between the basic sciences and language instruction is labelled as pedagogical linguistic (ŠEBESTA, 1999).

From the stereotype point of view, it is importante an *examination of the vocabulary from the viewpoint of the school*. Teaching of vocabulary and phraseology is part of the teaching of Czech in basic and secondary schools. The traditional, lexical, concept of meaning, as used in schools, proceeds from structuralism. The structuralists define meaning as the collection of basic properties relating to all objects / phenomena named by a given word. These are substantive, verified properties by which the given object / phenomenon differs from others. This concept corresponds to the *dictionary definition of meaning*. For cognitivists, on the other hand, it is the *cognitive definition of meaning* that matters. This extends the basic properties of the given object / phenomenon by typical, striking, properties that, in our cultural context, we regard as representative (see above). For cognitivists, the concept is a characteristic extension of the lexical meaning by the connotative element that reflects our experiences, emotions, attitudes and values.

Although the collection of our experiences is largely individual, we nevertheless, as members of the same nation, understand one another. The fact is that the associations of objects / phenomena transcends the limits of human individuality and grow into the whole community of speakers of the same native language. A mother-tongue teacher who integrates a cognitive approach to the vocabulary into his teaching will, together with his students, unveil the cognitive definition of meaning. The students will then in a natural manner widen their vocabulary and thus come to know the cultural traditions of the Czech nation and of the world as such.

If we integrate the findings of cognitive linguistics into upbringing and education, we gain instruments that can help us identify these egocentric tendencies in communication and those which in an analysis of contemporary communication patterns are marked by very limited linguistic means. The theory of stereotypes is a valuable help for us. We come to know the world by means of stereotypes, we form pictures of objects, phenomena, people, i.e. also of participants in communication. These stereotypes do not arise on the strength of objective insights, but are influenced

by a number of subjective factors, including the system of social norms of behaviour and expectation.

5. Cognitive linguistics and cultivation of communication

In our study we have also examined the contribution made by cognitive linguistics to the cultivation of communication. Cultured communication does not consist only in the choice of appropriate linguistic means; essential for it is *the relationship between the communication partners*. It is important to base it on *listening*, so that it can lead to understanding and information-providing. Listening creates in the student a realistic picture that makes it possible to adjust the educational effectiveness and the teaching style to the individual needs of the students.

The stereotype of the student in the Czech linguistic picture of the world is connected to the linguistic picture of the school. Once the realistic school and all its components are decisively changed, the linguistic picture of the school will change as well. The main aim of our study was to reveal how linguistic stereotypes, which are not objective but often have the form of prejudices, are reflected in education. A change of stereotypes proceeds only very slowly because it is historically firmly rooted. The more strikingly reality changes, the more quickly – albeit always with a delay – the linguistic stereotype will change. Even though teachers should not approach the students under the effect of prejudices, to prevent their education from being stereotypical, rigid and conservative, they should see to it that the students acquaint themselves with a linguistic picture of the world based on stereotypes. In this way they will have a major share in preserving the continuity of our nation's cultural heritage.

Phrasemes and sayings relating to the students point to the marked tendency to lead the student into a relationship with the teacher. This tendency arises from the teaching process, into which both the student and the teacher enter. The former is the learner, the latter is the teacher. The situation of the student outstripping his teacher is not an exception, but it is only exceptionally accepted by the teacher. In the traditional understanding the teacher should stand above the students in every respect; this is also reflected in his authoritative approach to them. This approach is reflected in phrasemes, in sayings, in anecdotes, in fiction, it is the subject of a number of films, it is taken up by cartoonists, etc.

The picture of the pupil / student in specialised, mainly paedagogical literature can be approached through the work of P. Gavory (1987). He offers a list of communication rules, based on face-to-face teaching in traditional classrooms. Most teachers stick to these rules and their infringement is often punished. The pupil is entitled to *speak only when the teacher permits him and only on what he was told ...*

From the list of rules it emerges that the pupil fits the idea of a largely passive individual from whom no creative activity is expected; he should mainly comply with the criterion of obedience and discipline.

A reaction to these rules are the words of Z. Helus to the effect that it is necessary to *diagnose the abilities* of individual pupils, their cognitive styles, and to adapt teaching to them. Cognitive styles are very important from the viewpoint of the teaching process.

“They represent the characteristic ways in which people perceive, remember information, think, solve problems, make decisions. They testify to consistent individual differences in the way in which people organise and direct their processing of information and experience” (TENNANT, 1988; Messick, 1994 *apud* MAREŠ 1998, p. 50).

At all educational levels of Czech language teaching emphasis is laid on the *making-oneself-understood function of language*. Alongside the teaching in school there remains the view of language as a part of thinking and of coming to know the world. It is on this concept that the *cognitive function of language* is based.

There is no doubt that the communicative function of the natural language is important; but we should not one-sidedly highlight it at the expense of the cognitive function. The communicative and cognitive functions are closely interlinked in language. The choice of naming presupposes that we must first “get hold of”, come to know, some phenomenon or reality that we wish to name: we must “start off” the cognitive processes at the same time.

We do not consider it proper to lay down clear instructions on introducing a cognitively oriented teaching of Czech. These should be chosen by the teacher in line with specific themes, subjects, on the basis of the actual situation in class and in line with his possibilities. Teaching should aim at revealing the interlinking of the language and the natural world, at the realisation that with the aid of language we come to know the world, that in language rests the integrity of our community, that language renders possible information, coexistence. It is a focus on aims that seem to be at variance with our contemporary majority trends that emphasize orientation towards making one’s way in the world, towards the satisfaction of material needs, towards the creation of a “charismatic image”... The overarching approach to the teaching of Czech should be the so-called *global education* (PIKE; SELBY, 1994) and *multicultural (intercultural) education* (PRŮCHA, 2004). The former makes it possible to comprehend the essence of the world and man’s role in it, the latter leads to an understanding of different cultures, ethnicities, nations and races.

An individual approach to the student is based on knowledge of the student, on diagnosing his abilities, skills, state of knowledge, etc. That can be achieved by using the tools of cognitive psychology (MAREŠ, 1998; STERNBERG, 2002), and also, within the framework of language teaching by dialogue. Great cognitive possibilities are opened up in dialogue and by means of dialogue. The theme and intentions of one’s communication partner are revealed, autocognition develops. Realisation of these possibilities presupposes willingness to listen, perceptiveness, openness, friendship between the two communication partners.

It is also necessary to mention *the school's approach to the process of making oneself understood*. Making oneself understood is based on the close relationship between language and coming to know the world. The merging of the two components occurs in speech; it is spontaneous and implicit. The cognitive approach reveals the intertwining of linguistic and cognitive processes. It is obvious that the teacher of the Czech language helps the development of both. Czech language teaching based on cognitive linguistics has a strong motivational character; it kindles in the students an interest in language as a means enabling mutual understanding and experience of the world in which we live. The greatest benefit, however, is that it reveals the meaningfulness of Czech-language teaching to the students. The experience of didacticians and Czech-language teachers reveals that most students have doubts about the usefulness of Czech. Rehabilitation of the Czech language in the spirit of the revelation of its meaning is a gain that should not be overlooked.

The linguistic-cultural picture of the world, based on stereotype, is not fixed. It changes with the development of a society and its culture. To enable new generations to link up with our national traditions it is necessary to care for the linguistic-cultural picture of the world. Kuras (2003, p. 15) speaks of the *threat of the cultural memory of the nation being wiped out, of the breaking of historical continuity, of the loss of social ethics and moral certainty...* Unless we develop our cultural values and traditions, there will be, according to Kuras, a loss of national, ethnic or regional pride and self-confidence. Such care is also one of the aims of cognitive linguistics. Through the study of the linguistic picture of the world it cares for the preservation of cultural ones, upon which rests our national identity.

6. Conclusions

The first goal of the study was to show the *positive influence of stereotype*: it enables the explanation of cognitive words meaning based on connotations connected with emotions. It enables understanding of our cultural heritage, e. g. through folklore texts, artistic texts, folk phraseology, etc.

The second goal of the study was to show the *negative influence of stereotypical approaches* used in the course of the teaching process. Such undesirable approaches are stereotypical teaching method and stereotypical approaches to the pupil.

In conclusion we are inspired by the ideas of H. Arendt, which reveal what changes the school would have to pass so that the stereotype of the pupil is linked chiefly with positive qualities. Obviously such a change will also be accompanied by a change of the stereotype of the teacher.

School should, above all, teach the children *what the world is like – not give them instructions on how to live*; it is not a sphere of action, of changing the world, but a sphere of cognition and self-forming through the mediation of cognition. Emerging from it should be an independent person, who renews and further develops the world and culture (ARENDTOVÁ, 2001).

We hope to have succeeded in this paper in pointing out at least some possible applications of cognitive linguistics in pedagogy and the didactics of the mother tongue. Stereotypes reveal themselves in language and speech and it is therefore necessary for a teacher to reflect the cognitive function of his mother tongue to fulfil his mission and to cultivate interpersonal relations.

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Brain, cognition and language

1. Introduction

This article discusses the connection between brain, cognition and language. This topic is of long standing concern, and is subjected from time to time to a theoretical discussion which has arisen again and is, in theory, not discipline demarcated and [ultimately is] not a minor matter. It is known, for example, that in 1970, according to Piatelli-Palmarini (1983), Piaget and Chomsky debated this issue. This encounter between these academics was of great interest to the scientific community in general and had even attracted the attention of numerous research groups worldwide. The two theorists directly involved in this discussion, however, persisted immovable in their views, which resulted in a frustrated attempt to synthesize them. In fact, the disputed subject continues until today under discussion and concerns the biological foundations of a possible difference, within the cognitive domain, in the initial state of the knowledge construction process. The theoretical dispute, that has gained prominence in this period, continues to be relevant and the fact is, whether it is addressed or not, the relationship brain / cognition / language is essential to research with respect both to perceiving, thinking, reasoning, memorizing, learning, understanding and to language. In other words, it is of great relevance to the cognitive sciences with specific regard to mental activities and also to the shortcomings of aphasia, Alzheimer, phonological disorders and also for a range of cognitive-linguistic problems involving the human brain and what is considered normal or pathological.

To start with, it is necessary to make clear that, although the relationship “cognition and language” has been widely discussed and investigated for many years, the brain was only really integrated into this study field in the 90s, when Neurosciences reached its scientific maturity by developing technology to scan the brain of live people. The possibility to use non aggressive technologies that watch the brain processing on-line was crucial for the scientific community to assimilate how indispensable is the study of the human brain.

It is also important to mention a comment from Morato (2001, 2004) that, referring to neuro-cognitive studies, states that it is part of this field tradition to take for granted the existence of “a dichotomy between the linguistic and the cognitive”. According to her, the aphasias used to be considered a linguistic problem, and she complements, *metalinguistic*, and the neuro- retrogression, such as Alzheimer’s disease are classified as cognitive, conceptual and psychological problems. To sum up, they are not understood to be linguistic problems.

As we presume, the frontier between cognition and language is still accepted. In the medical area, for instance, the cognition has precedence over the language. The way we understand it, it seems that the division between cognition and language had its origins in an academic division of disciplines, which still nowadays remains unsolved. In the end, what is language? Professionals, from different areas, not only lay people, understand language as a thought's epiphenomenon, an excrescence. Others think it in terms of aesthetic, as an adornment, and so on. The possibilities are in fact many and really exist. But language is, besides that and also, cognition.

It remains to be seen (or clear) the essence of language regarding cognition, since it is definitely not just a secondary epiphenomenon neither a secondary thing, from a cognitive point of view as conceived by Piaget. And the fact is that even today it remains a great obstacle for medical sciences with respect to language. As properly reasoned by França (1987), the issue at stake is conceptual, since many scholars consider language, dependent on intelligence thus, inferior to it.

Morato (2001) proposes to dismantle this dichotomy, so disgraceful to the scientific study of language, by adopting a Vygotsky's theoretical perspective, advocating a dialectical relationship between the cognitive and the linguistic to address the significance, which anchorage would be the context of enunciation, in other words, the usual practices of language and not the language, as a systemic disembodied abstraction. Moreover, the author also mentions the need to "dilute" the dichotomy *langue/parole* (2007). In her work, this researcher reiterates several times the Vygotsky's postulate, that says there is no cognitive content or thought domain outside language, and similarly, there is no language outside the discursive practices.

On the other hand, if inadvertently or by convenience we consider the cognition's concept as hyperonym, a highly organized one in relation to language – which would be included in it as an hyponym – we would be tacitly admitting the language minor extension, the same way the number one is included in the number two, the rose concept is included in flower. This is not likely because both concepts do not coincide in many ways and not only with extension.

If, instead, we opted to state that the language's concept keeps a part/whole relationship (meronym) with cognition, this assertion would obligate us to admit that the relationship between both concepts would be dispensable, being circumstantial. It is the case, for instance, when mentioning a leather briefcase I say that the leather's strap is scratched, it is obvious that I am referring to my leather briefcase. Although, the briefcase could have been made of another kind of material – canvas – in this case the leather would not be essential, as only one of the materials available to produce the briefcase. The implication derived from this reasoning is that language would play a second role in relation to cognition. However, it seems not to be the case.

As we presume, linguists are dedicated to the study of language and psychologists to the cognition, it is not a parallel that can be quickly or superficially drawn. The theoretical approach between cognition and language is problematic, contributing to strong debates and many divergences. Jakobson (1974, p. 67) had already warned

about this problem when he stated that “the psychologist involved with language started to realize that the mental activities related to language [...] are completely different from other psychical phenomena”.

Attempts to establish a cognition/language study unity has shown some difficulties, which sometimes ended up in theoretical reductionism and, inevitably, in much polemic. However Aristoteles stated that the science of contrary is unique, the continuity of successive stages from one pole to another, however, does not annul the difference between the extremities. Canguilhem (1995), when focusing on the relation between normal and pathologic – another well know dichotomy – states that the pathologic cannot be seen as the remnants of the normal, as something that remained after a destruction. It is another behavior, a new lifestyle. This makes us continuously reiterate the idea of it not being possible to identify cognition and language concepts by reducing them to one another, but only by relating them to themselves.

In this way, Marková (2006) proposes to overcome this divergence by investigating and analyzing what is she called “opponent thought”. According to the author, the antinomies are present in the majority of scientific studies and maybe it is advisable to consider them as constituent of mind – the dialogical mind. The author supports the idea that the opposite coexists, forming an interdependent and integrated unity. The constitution of such unity would imply integrating concepts seen as opponents, or in our case, concepts that are not reduced to each other. It seems to us that the expression “dynamic polarity”, used by Canguilhem, would fit the author’s proposal and, because of that, the existing relationship would not be kept as indiscernible.

If the antinomic thought is considered, the first consequence would be that cognition/language, instead of disputing territories, would involve reciprocity and could even admit asymmetric relationships but never dissociated from each other. Although with different proportions, both would constitute, at the same time, the basic balancing force of cognition/language.

2. The antinomy change/stability

The analytical perspective from Marková (*op. cit.*) motivates, on the other hand, to resume another historical opposition treated by two eminent thinkers - Saussure (1972) and Piaget (1974, 1985). Both were worried about the aporia change/stability, from two distinct points of view: one focused on the language analysis (language’s system) – via the Structuralism Linguistic principles – and the other, via the Genetic Epistemology theory.

The dichotomy was explicitly treated by Saussure (1972) and was discussed by scholars, such as Carvalho (2003), who were interested in his work. The way Saussure conceived the problem was manifested in his famous opposition to *langue/parole* and *diachrony/synchrony* concepts. This division has characterized his language’s study, although it is known that he decided to research *langue* and *synchrony* after evaluating the theoretical dimension present in this choice.

This option has been translated into a theoretical-methodological period horizon, although the author was aware of the consequences of such choices. The decision he took was, in part, a result of the fact he could not conceive, at that time, that such changes could be related to the interdependence between system stability and the individual and dynamic aspect of the language (parole).

In his understanding, the personal and the social used to be seen as divorced and a distinct realities. This binary perspective gained evidence in his studies as he was no able to admit the treatment of these two realities together and in an integrated approach due to the fact he considered such a perspective illogical.

Piaget also gave evidence in his work about being concerned with the aporia change/stability, conceiving cognition as an open system which continuously interacts with environment by means of assimilation/accommodation. This reciprocal action would provide the necessary conditions for the balance of each evolutionary stage.

The innovative nature of Piaget's proposal is that it took stability and change into account simultaneously in the development of children's thinking. The concept of balancing was conceived as a process of organization and reorganization of cognitive structures, when new content was then integrated into existing structures. The dyad assimilation/accommodation works on the Piagetian view jointly and synchronously, working to ensure the inclusion of the new - the shift - to the already known - the data.

On the other hand, Piaget has also proposed the stage of development concept that involves a synchronous hierarchical progression through which every child would develop from one way of thinking to another. Which means that in Piaget's view the thinking process begins in the mind/brain of the individual, and the stages of development represent an advancement of the individual in a given direction: from less complex to more complex, from an early age to a more advanced. Thus, the concept of stage had a universal and teleological character, and its sequence did not imply the possibility of individual stories which were not included in the scheme, and in the unexpected one. What became clear was that Piaget considered the concept for change, internally within each isolated stage, being unable to explain how each one of these stages progressed to the next one. The prospect of changes was running out because within the evolutionary synchronous stage limit, immobilizing the dialectic individual/environment, which remained in the background, was obscured by the stages of development theory. Moreover, Piaget has not mutually articulated shift/stability as a set of interdependent forces.

On this topic is also worth mentioning - as already stated in the beginning - the theoretical clashes between Piaget and Chomsky in the 70s which are referred in Piattelli-Palmarini (1983). Chomsky's ideas attracted the attention of the most influential scholars at that time. Piaget, for example, became very interested in his ideas because he and Chomsky understood language as a general psychological capacity similar to thought. However, the attempt to find common ground failed. Although cognitive, Chomsky did not see the cognitive issue the same way as Piaget used to, and vice-versa. One prioritized the thought and the other language.

3. Cognition and Metacognition *versus* Language and Metalanguage

To resume our reasoning and also to extend it a little, let us distinguish between cognition and metacognition, referring to the concept of metacognition coined by Flavell *et al.* (1981). For these authors, metacognition is cognition about cognition that is, the thinking about their own thinking. The first consequence of this conceptual *résumé* is the fact that, if analyzed in these terms, the scope of the metacognition concept would be lower than cognition's concept itself. In fact, it would be limited to consideration, not including the whole range of cognitive activities involved in the information's process, which mobilize the mental and psychomotor functions in their entirety, as follows: perceiving, watching, recognizing, recovering relevant information in order to interpret and understand, learning, modifying, memorizing new information, identifying and solving problems, talking, gesturing to make oneself understood, etc.

On the other hand, acceptance that the metacognition concept leads to metalanguage implies the assumption that cognitive development involves the language development, which would result in a minor role being attributed to the natural language in the development of the human person, which is at least debatable, because cognitive psychology has not so far explained the basic problems of the relationship cognition/language, citing explanatory omissions notes related to key aspects of the language development, namely:

- (1) How the child progresses to the stage from where cognitively one grasped the concept to the stage where it starts to encode it in a linguistic form recognized as word?
- (2) How to explain that the language mechanisms are purely formal, meaningless, which are also grasped and appropriately managed by the child?
- (3) How one can justify, on the other hand, the fact that a child, having learned the concept of a linguistic code, continues learning alternative coding of the same concept?
- (4) How to find a plausible reason for the fact that some children show a normal cognitive development but not have acquired the normal spoken language, giving evidence of its own pace and patterns of development, being only partially similar to the usual?
- (5) How to see if there are unforeseen or unique occurrences in the linguistic and cognitive development of children who deserve special attention?

The questions listed above (1 to 4) were submitted by Bowerman (1978) and they are added to in the Schlesinger (1977) inquiry. The latter argued that, although cognitive change is a prerequisite for the children to interpret their environment, it is not sufficient to establish the necessary categories for language, since the concepts

abstracted from the extra-linguistic context do not always have a one-to-one connection with the corresponding linguistic categories. For Schlesinger (1977, p. 156), “our adult judgment about what is and what is not understood under the agent concept is deeply influenced by what our language expresses as being an agent.” The argument is important because it focuses the question that many semantic categories are acquired as required by the language itself, having nothing to do, specifically, with cognition.

The analytic gap afforded by Bowerman and Schlesinger’s weight shows that language acquisition and learning cannot exclusively be explained, by designing forms (linguistic) to concepts already developed. It seems that both a level of cognitive maturity and linguistic input are crucial.

Despite the existence of these problematic issues, many psychologists still consider that the metalinguistic skills are under the metacognition concept, which seems to be a broader one. However, as stated before, there is no unanimity about it. Below we refer to some authors who have raised some questions about this position.

Gleitman *et al.* (1972) are authors who reject the precedence of metacognitive over metalinguistic in any circumstance. In turn, Clark (1978) sees both differences and intersections between metalinguistic and metacognitive skills. Finally, based on Piaget’s theoretical model, Van Kleeck (1982) seeks to strengthen the bond between the two points of view.

These approaches have emphasized different aspects of the same phenomenon and Gombert (1992, p. 8) points out that, evidently, on accepting the definition of Flavell *et al.* (1981) which says that metacognition is cognition about cognition, we would not be automatically endorsing the idea that meta-learning is learning about learning, meta-attention is attention about attention and so on. The most appropriate characterization, he says, is that meta-learning is cognition about learning, meta-attention is the cognition about attention, etc. Similarly, metalinguistic activities, according to his ideas, do not refer to language about language, but to cognition about language, which is one of the key concepts of the metacognitive activities group.

Although plausible, the Gombert’s considerations (1992) does not serve our purposes and we would like to emphasize that psychologists such as Flavell (1977, 1981) and Tunmer and Herriman (1984), among others, ignored the theoretical contributions of Jakobson (1963), which were afterwards approved by Benveniste (1974), on this subject. Poersch (1998) and Flôres (1998) have already reported the fact, focusing attention on its oblivion.

Thus, despite the relevance of some of the Gombert’s weights (1982), it is necessary to emphasize that Luria’s understanding (1986, 1990) on the investigated subject illuminates another dimension of the issue under discussion. Not translating a mere concern with the concepts categorization involved, in extensional terms, because it is not sufficient to establish a hierarchy that only fits the theoretical issue.

Luria, in fact, states that it interests him to give a new orientation to the way the problem is considered. He ensures that, before anything else, it is necessary to focus attention on both cognition and language operation, considering it as a whole,

functional and capable of programming and planning. In other words, according to Luria (1986, 1990), metalinguistic activities are essentially self-regulatory, which means that they monitor and control the linguistic operations, even being able to modify them if necessary.

Luria in his thesis states that the metalinguistic activity involves the attention, the analyzers and its organization. Besides, it is involved in the way the language is managed, including the act of monitoring its own processing in order for the individual to understand the reality and their own “I”. In such cases, the metalinguistic activity would overlap what is meant by cognition; the metalanguage, in such circumstances, would direct cognition rather than being driven by it.

Human interaction would therefore be, according to this concept, the propeller of meaning construction processes. And language, due to being part of the cognitive processes structure, would be responsible for regulating and mediating the entire psychological activity. Regulation and mediation would be manifested through two types of operations. The first, called epilinguistics – hesitations, self-corrections, re-workings, erasures (in writing), long pauses, repetitions, anticipations and lapses - are common in the language acquisition process (KARMILOFF-SMITH, 1979, 1986; DE LEMOS, 1982) and would also take place, according to Coudry (1988), in the language reconstruction process for an aphasic subject.

As seen, the dialectic nature of discourse allows the expression of the coordinated linguistic and psychological, which constitutes the language functioning, that is, according to our understanding, it is structured by itself in a way we understand it, through epi- and metalinguistic operations, as the communication interaction leads to such operations. Additionally, the understanding of language as an activity fits into a dynamic view of brain function which, in turn, enables the relationship between language and cognition.

Basic to this approach is the way language is conceived. If the world’s organization and interpersonal relations are processed through language, then it must have some inter- and intra-psycho mechanisms that take care of its arrangements, during the communication. Thus, the epi- and metalinguistic processes reflect, in fact, the occasions when the subject makes self-adjustments to correct themselves and reinterpret the other’s speech, or when they hesitate, it is understood, they resume using their own words, make a slip of tongue and make assumptions, and so on. Such behavior cannot be compared with the mathematical logic image because in that case it would eliminate the deictic coordinates of the interactive situation, the assumptions of knowledge, the images the interlocutors have about themselves, the inferences, etc.

In our view, the epi- and metalinguistic processes are actions, that regulate language, manifesting itself in a continuous operation from an unconscious to a reflective and deliberate activity. In fact, the domain of expressive resources and their mobilization cannot be, as we understand it, only a cognitive issue, since they relate to the fundamental property of dialogic language: the role’s reversibility during the dialogue.

3. Metaprocessos versus Epiprocessos

There is some consensus among non-Chomskian linguists, at least with regards to the nature of the metalinguistic activity, based on Jakobson's studies of language functions. That is, the *status* of metalinguistic activity requires, as a prerequisite, to be a conscious action and therefore its emergence presupposes that the person is capable of monitoring and thinking on their own language production and comprehension.

Hakes (1980) distinguishes between episodic and early metalinguistic behaviors from later metalinguistic behavior which could be triggered by external stimuli. Kolinsky (1986) assures us it is necessary to differentiate two types of skills. One, translated into a spontaneous demonstration, and the other based on the knowledge represented, which may be intentionally applied.

On this issue it is worth adding that "In the case of language, one can distinguish two moments in the development of an intentional and abstractly significant proposition: a subjective moment in which the notions come automatically to mind and an objective moment when they are intentionally displayed [...]" (CANGUILHEM, 1995, p. 250).

So, it seems that the epilinguistics processes turn to language, but this kind of thinking has as its object the use of significant and expressive resources in terms of "language-situation", in other words, an entirety that cannot be dissociated from its parts.

In turn, the metalinguistic activity, as an analytical reflection on the significant expressive resources that lead to their categorization, focuses on its own resources. Therefore, in order to have any meaning, since the process is essentially scrutinizing, it requires that the epilinguistics activities have preceded it, and because of that, an ongoing exchange between epi- and metalinguistic activities taking place. In other words, one thing leads to another.

4. Final words

Marková's theoretical (2006) conception, coupled with Luria's theoretical proposals (1986, 1990) and Coudry's (1988), was decisive for the sake of integrating metacognition and metalanguage theoretical concepts with cognition and language. On the other hand, Morato's investigations (2001, 2004, 2007) allowed a theoretical assumption so far non-viable.

In short, interactionism, as we conceive it, did not lose its importance. It is even possible to it sustaining the basis of its proposal despite the stage of development concept signs of wear. Cláudia de Lemos (1998) proposed, instead, the concept of change. De Lemos acknowledges, with respect to the language acquisition, that "the theoretical project [...] socio-interactionist has not been successful in demonstrating how the structural properties and categories of language and reasoning can be derived from interactive processes" (1998, p. 152). The author suggests, however,

an alternative which is to consider the “operation of the language in the context of a specific language, to which both children and adult are subject. Because it is through this operation they – adults and children – maintain a transformed relationship with the world” (DE LEMOS, 1998, pp. 169-170). In other words, the author points out that the operations for reorganization and redefinition of meaning within the statement itself is produced by focusing on the metaphoric and metonymic process, which triggers the change mechanisms. What changes in the way the individual behaves happen due to their engagement in the communicative situation and context (enunciation), involving verbal and nonverbal language: it does not originate outside, nor inside the speaker, exclusively.

The problem here is therefore not only of an extensional order. It might be productive to consider the antinomian thought concept as being integrated to the brain/cognition /language and also to the meta-cognition/meta-language in terms of interdependent and interrelated systems.

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Cognitive aspects and teaching implications involved in the evaluation of reading comprehension

1. Introduction

Reading evaluations applied to Brazilian students show an apprehensive reality: besides illiteracy, i.e., not being able to read and write, Brazil presents a huge amount of functional illiteracy, people who are able to read, but are unable to build meaning upon the text. In our universities, teachers of several disciplines claim that students show poor reading abilities. Even texts of wide circulation, like newspaper articles, seem to be hermetic to students with more than ten years of schooling.

Therefore, it is increasing the concern of educators, parents, and researchers as well as the Brazilian government institutions with regard to the efficiency of the instruction for reading and writing. Aimed at building a true citizenship in a democratic society, the minimum that a person needs is to master the reading code in order to have full access to the texts published in newspapers, magazines, books, advertisements, etc. Furthermore, the survival in today's literate society is related to the individual's ability to read instruction manuals, street and shop names, bus routes, medicine guidance – all information to be reach though the reading code

Once assessed the lack of reading comprehension of our students and the relevance of this knowledge, I have developed a research project aiming at: (1) to delineate a panoramic view of how reading and its comprehension are conceived by school teachers in the Rio Pardo Valley, Rio Grande do Sul, Brazil; (2) to diagnose the language conceptions underlying the pedagogical practices used to evaluate reading comprehension; (3) to help teachers to find more efficient methodologies for reading education and for evaluating reading comprehension.

This article is organized as follows: firstly, some theoretical issues related to the cognitive aspects involved in reading comprehension, to the reading teaching / learning and to the evaluation of reading comprehension will be presented. Secondly, the research methodology adopted and the results achieved will be described. Finally, some thoughts are developed, orientated by the objectives described in the former paragraph.

2. Reading

Reading is a particular activity of verbal language. As with oral communication, reading is an exclusively human ability. Reading, or reading comprehension, is a

highly complex phenomenon involving unexpected cognitive aspects; some of these are highlighted in this article.

Kintsch (1998, p. 13) claims that for one to be able to think, to understand and to perceive, some kind of mental representation is needed. Once it is assumed that reading involves forms of mental representation, what is being presumed is that reading requires at least one type, or even several types, of memories. As mental representations are nothing more than the translation of what we perceive or intake from the world and from our experiences into a language, the storage mechanisms of this knowledge in the brain must be understood. In other words: at the end, reading comprehension involves the way that neurons **acquire, transfer** and **integrate** information throughout the uncountable synapses available in the human brain.

The word “memory”, according to Izquierdo (2002, p. 16), designates the general ability of the brain and of other systems to acquire, retain and recover information. On the other hand, one can talk about “memories” to refer to the several types of memories, classified according to their functions. Following this criteria, we have the working memory and other memories.

Working memory is processed in the prefrontal cortex and does not generate files, i.e., it is not precisely a memory because nothing is saved in the brain in the **long term**. Its capacity is limited to the process of a span of more or less seven chunks.

Memories can be also classified according to the stored content. Procedural memories are “knowing how” memories work, for example, the eyes movement while reading or the speaking apparatus movements during conversation or reading aloud. The knowledge our bodies have acquired about the necessary procedures to accomplish certain tasks is mainly unconscious and not translatable into words. This is the aspect that distinguishes procedural from declarative memories, which can be divided into episodic (autobiographic) and semantic (linguistic) memories.

Both procedural and declarative (episodic and semantic) memories are acquired through our experience, our life history, and constitute our long term memory, referred to in the reading specialized literature as “previous knowledge”. Therefore, previous knowledge comprehends both the procedures adopted while reading as well as the linguistic and cultural knowledge that we have acquired during our whole life time.

Kintsch (1998, pp. 17-18) describes some types of mental representations needed to achieve reading comprehension. Firstly, a perceptual and a procedural representation related to the reading material are necessary. To be able to read this page (or screen), for example, the reader has to move his / her eyes from the left to the right side until the line ends and to restart immediately on the next line, moving both back and down. Even when one is unconscious of those procedures, they were learnt at one point of a subject’s life. Monolingual readers of Arabic, for example, while reading a text, perform differently because of the characteristics of their writing system.

The reader has to have an episodic representation, because the scenes described needs to be filled in by the reader’s episodic memory. Therefore, the reader’s world

knowledge, stored in the long term memory and which was acquired during his life experiences, will be retrieved while reading. In case the text requires knowledge not available to the reader, comprehension might not be achieved.

To be able to understand reading, it is presumed that the reader has a representation of acts, in order to identify the author's intentions build in the text through the structure used, the lexical choices made, the hidden and expressed meanings and several other subtleties that language and human actions have created.

A narrative representation is also needed, which is a kind of linguistic representation, to enable the reader to recognize the sequential order of stories and their elements: a writer, a reader, a script. According to Kintsch (1998, p. 18), a considerable amount of what one knows was learnt in a story format, for example our knowledge about culture and history. Without disagreeing with the author, it is possible to argue that in reading comprehension it is also necessary a representation of the text genre in question, which will enable the reader to compare the elements available in the text with previous text genre and their characteristics, stored in long term memory.

Finally, it is imperative the existence of some kind of abstract representation, linguistic but non-linear, requiring logical thought whereby the reader is capable of understanding metaphors, inferences and irony. Reading takes for granted all the mental representations formerly described, and several others not considered or that we are not aware of so far, integrated during the reading process, aiming at reading comprehension, meaning building and sense production.

3. Reading teaching / learning

Chapter 6 of Vygotsky's book *Thought and language, the development of scientific concepts in infancy*, brings a set of highly appropriate reflections when the issue is reading teaching / learning. Right in the beginning of the mentioned chapter, Vygotsky (1998, p. 105) quotes Tolstoy and gives a lesson regarding how vocabulary acquisition works and how new concepts develop in a child (and needless to say, also in adults) through reading. In the sequence, Vygotsky comments on considerations about the distinction between speaking and writing and how school learning expands the child's mental development.

With assistance every child can do more than s/he can by her/himself – though only within the limits set by the state of her/his development. [...] What a child can do with assistance today s/he will be able to do by her/himself tomorrow. (VYGOTSKY, 1998, p. 87)

Therefore, the school role related to reading cannot be restricted to the offering of reading materials or to devote time for students to read. To adopt an approach in line with the Vygotskian theory, it is necessary that teachers act as mediators, assisting

children in text comprehension. The student, as an immature reader, many times does not have at hand the previous knowledge required to master a text comprehension, neither in linguistic nor cultural terms.

Reading comprehension requires the integration of knowledge brought from the text together with the reader's previous knowledge. If some knowledge does not exist in the long term memory, it is not possible to have access to it. Therefore this situation makes it necessary for a mediator intervention; in the school reading, teacher's intervention is required. Sources of difficulties commonly can be the text vocabulary, other times can be the concepts which cannot be accessed by the reader, or the world knowledge required by the text might not be compatible to the reader's world knowledge, along with several other difficulties that the readers might have to cope with.

To evaluate the sources of text's difficulties for a specific readers group is the teacher's task, who throughout reading or before reading, needs to diagnose students previous knowledge in order to fill in possible gaps in knowledge in any of the areas, making it possible for the student **to understand** reading and **to learn** through reading. In addition, in line with Vygotsky in the above citation, the limits set by the state of the child development have to be taken into account, i.e., the text to be read with the teacher's assistance must have certain degree of challenge, but cannot turn into a complete frustration.

Nunes and colleagues (2003, p. 100) argue that nowadays pedagogical approaches see reading and writing as if they were goal-activities. If, on the other hand, reading and writing were considered as tool activities, through which we communicate with other people or even with ourselves using written texts, teachers would create a wide set of situations to use the written language from the first years of schooling. The written language use attached to real or pseudo-real situations makes learning more significant and encourages an active learning posture in students. According to Kintsch (1998, p. 330), besides the previous knowledge domain required by the text, it is necessary that students assume an active posture towards reading, because they need to make inferences, to fill in gaps, in order to create macrostructures and to integrate new knowledge with previous ones available in long term memory, i.e., aiming at learning throughout reading.

4. Comprehension evaluation

Assuming a pedagogical perspective, which is discussed in this article and which I adopt in my own research, the evaluation of comprehension is one crucial step in the reading teaching /learning process. Alternatively, the main goal while evaluating reading comprehension in the classroom is to identify the difficulties that are blocking the learning process allowing for a better planning of pedagogical approaches. Schools do not have the right to devote themselves only to the best students; their duty is precisely to care for all of them, despite their differences.

All this reasoning implies that one of the main educator's roles is to evaluate aspects in a text that might cause comprehension difficulties, based on his/her previous knowledge about the students' group. The evaluation of difficulties needs to be part of the school activities planning to improve the students' learning abilities for reading comprehension and must be continually calibrated during reading teaching, guiding possible changes in the program to be developed.

It is important to keep in mind that the process of reading comprehension is at least partially subconscious. Readers are aware only about the reading results, i.e., text comprehension (partially or fully). As a result, the access that one has to understanding is always indirect, through strategies such as text discussion, discursive answers, multiple choice questions, notes, summaries, rewriting, criticisms, self evaluation, etc. Therefore, failure detected might be due to problems in comprehension, but might be also caused by the type of tools used to assess the student's comprehension of what she/he is reading. Hence, tools used to assess reading comprehension need to be constantly evaluated, aiming at accuracy. Unfortunately, a lot of work developed in schools does not take these topics into consideration. In the sequence, I will describe a field research developed among school teachers working close to the University of Santa Cruz do Sul, Brazil, and I will present and discuss some results.

5. Research methodology

Questionnaires were answered by 12 teachers to assess their conception about reading and its comprehension. Participants were all teaching 12 to 15 years old students attending six and eight grades at state and private schools in the region of Santa Cruz do Sul, Brazil. Reading comprehension tests were applied to students. Schools were selected according to the students' socioeconomic background, informed by teachers, looking for a balance between rich and poor backgrounds. In the present paper, only data collected through teachers' interviews will be discussed.

The tool guiding teachers' interview for data collecting is available at the end of this paper. The interviews were audio recorded and subsequently transcribed. As can be seen in the latest item of the interview, teachers were asked to provide copies of pedagogical materials used in their classes when evaluating students reading comprehension. Moreover, a few reading classes of those teachers were observed and video recorded, with the allowance of teachers and school administrators.

6. Results and discussion

When teachers were asked about how they approach reading in their classes, the majority said they have scheduled one of the five weekly classes of Portuguese Language (50 minutes each) for students 13 to 15 years old, at the school library. Either in the library or in classroom, after lending or returning books, they could spend their

time reading: *“Weekly the students have a reading class and then we go to the library to change books and they can spend the time left to read”* (Participant 4).

Several answers suggested that, when asked how to approach reading in the classroom, teachers understood the question in the sense of what needs to be done after reading (tasks such as summarizing, taking notes, filling in questionnaires *etc.*), as if reading comprehension would be achieved by the simple act of carrying out these tasks. However, no teacher interviewed mentioned meta-cognitive declarative procedures. In other words, the after reading tasks to improve and to evaluate comprehension, providing elements for pedagogical intervention were not employed at least they were not mentioned nor observed by the researchers.

I took into account mature readers’ experience, when they exchange ideas with one another or even when they re-read the text, looking for text aspects which were not perceived, therefore improving their text comprehension. But this interaction reader-reader or reader-text does not seem to be the emphasis of the reading approach in the classroom. The oral comments script is more or less as follows: silent reading, oral reading, opinions about the text (Did you enjoy reading the text? Is it a good text or not?); One example of answer to the questionnaire is: *When reading is text interpretation first students read silently, then one student reads aloud, sometimes I do it and sometimes a student with good pronunciation does it...* (Participant 10). In addition, the same Participant 10 says the “good pronunciation is not an ability to be developed by schools. Either students have or do not have a good pronunciation”. None of the interviewed teachers mentioned any activity involving pronunciation, intonation, fluency, rhythm. I believed that good pronunciation whilst reading, which requires good decoding skills, together with reading rhythm and fluency have to be trained in the classroom because these abilities will interact with reading comprehension. Once these procedures are incorporated, i.e., done without effort, working memory will focus on building meaning.

Comments about the use of texts to teach grammar aspects, like “Word classes” (nouns, verbs, adjective, adverbs, etc), were as follows: *“For example, now in fifth grade, I am teaching a bit of grammar, then I try to put this in reading”* (Participant 8). Contrary to the linguists’ dominant position that studying grammar aspects favors improving comprehension, Participant 8 defended the view that “a bit” of grammar may be taught only after fifth grade then inserted into reading activities.

It is common sense among the interviewed teachers that reading is a very important skill and that it is desirable that students read, and, if possible, as an enjoyable activity. However, when asked how they approach reading in their classes, teachers seemed insecure, suggesting lack of reflection and planning of actions whose priority should be developing reading comprehension. A few teachers expressed their thinking saying that *“in the moment that we read a text we are approaching reading”* (Participant 5), but this is a tautological conclusion, since it does not explain the strategies used to approach reading in their classes, planning activities to make reading rich in terms of domains, texts genre, origin, and, as a consequence, rich in terms of cognitive schemes, vocabulary, syntax, levels of formality, etc.

None of the interviewed teachers clearly asserted in a self confident way that their role was as a mediator between text and students. It seems that to teach reading at school is much more a matter of giving students access or facilitating students access to reading material (library books, newspapers and magazines, text books or any text that reaches teachers hands) then effectively helping students in the process of discovering possible meanings within a text. Also, it was not mentioned by any of the interviewed teachers, the use of internet as a source for reading materials or an origin of texts to be read. The reading materials listed by teachers were text books, literature books available in the library and, occasionally, newspaper texts.

Regarding the materials provided by teachers which were conceived to evaluate students reading comprehension, they are restricted to copies of pages from school text books. The conclusion I have drawn, as did Vicentini (2003), is that majority of teachers approach reading in an intuitive way, with restricted knowledge of the cognitive, theoretical and pedagogical assumptions related to reading. Another aspect is that interaction in classroom focusing reading of texts is restricted to superficial questions about liking or disliking. Souza and Gabriel (2006) highlighted attention to these aspects in a research using the verbal protocol technique. The results showed students with considerable difficulty for describing what was read and for thinking about it. They preferred to utter personal opinions regarding secondary aspects instead of focusing in the main topics.

7. Conclusion

Data gathered in my research, partially analyzed in the present paper, suggests the identification of at least three distinct groups of teachers working with teenagers: (1) teachers who showed limitations in reading comprehension; (2) teachers that understood what they read, but were not aware of the cognitive processes involved in reading; (3) teachers that had good comprehension skills, but had an inadequate conception about the processes involved in reading. Moreover, although teachers agreed regarding the relevance of reading in nowadays society, nevertheless, they presented many doubts with respect to their role in teaching reading. This last conclusion motivated the organization of two new research groups: “Language and cognition” and “Reading, literature and cognition”, to developed a new project named “The construction of knowledge and competences in reading: developing teachers-readers”, to take place at the University of Santa Cruz do Sul, Brazil. The project includes workshops with several different genres of texts. Throughout these workshops pre and post tests will be run to evidence the effects of the intervening experiment. Audio and video will record the interventions dialogues among teachers-participants during the workshops. The researchers aim at providing tools for participating teachers to teach reading, cascading good practices, helping teachers to approach their students reading in a more effective manner, and contributing to the learning of reading and throughout reading.

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Appendix

INTERVIEW WITH SCHOOL TEACHERS

I – Identification

School _____

Address _____

Date _____

Type of school () private () state (local) () state (regional)

Socioeconomic background of the students

() high () medium-high () medium () medium-low () low

Teacher's name _____

Levels in which teacher works _____ Subject(s) _____

Weekly number of hours: in class _____ for planning _____

Education _____ University _____

Year of conclusion (graduation) _____

Do you attend in-service and / or short courses? _____

How frequently? _____

How frequently do you read books related to your professional activity? _____

Which is the latest book you have read (related to your professional activity)? _____

Title _____ Author _____

II – Reading

1 – What is reading? _____

2 – What are the purposes of reading? _____

3 – How is reading approached in your classes? _____

4 – How do you select reading materials for your classes? _____

5 – How do your students feel regarding reading? _____

III – Reading evaluation

1 – Is it possible to know if students understand a text? How? _____

2 – Which activities do you employ to verify if students understood what they have read? _____

3 – Why do you employ these activities? _____

4 – What are the major difficulties presented to you by your students in reading comprehension? _____

5 – Would you be willing to loan some teaching materials used to verify students reading comprehension in your classes (tests, texts, exams, questionnaires, etc)? _____

Speech Comprehension and Production

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A case study of input modality, working memory and comprehension

A lot of research has been carried out to investigate how memory influences the living and learning of brain damaged patients. Different methods have been used to identify a role of specific brain regions in memory and language processing. The purpose of this case study is to explore the effects of working memory capacity, modality (aural versus visual) and language (L1 versus L2) in the comprehension of discourse of brain-damaged patient with learning deficits. Overall results demonstrate that there is no clear relationship between the scores obtained in the span tasks and this subject's performance on the comprehension tasks.

1. Introduction

Understanding memory is an issue that dates back to Aristotle and continues to intrigue psychologists and neuroscientists nowadays. The scientific investigation of memory, however, only began about a hundred years ago with Ebbinghaus' studies of human memory. Since then, a considerable amount of theoretical questions about the underlying mechanisms, functions and nature of memory and its impact in learning and cognition have been pursued by researchers.

Of particular importance to cognitive psychology, and consequently to everybody involved in the educational milieu are the contributions of William James, who theorized about complex issues such as perception, attention, reasoning and the slip-of-the tongue phenomenon and the three-stage model proposed by **Atkinson and Shiffrin in 1968 (not mentioned in the references)**. This model has given subsidies to researchers on how to investigate human cognition such as learning, remembering and forgetting. The design of specific tasks to evaluate the characteristics and specificities of each of the components of memory has provided important information to psychologists who have been able to unveil much of the inner processes of human cognition that involve information acquired through our senses, such as those involved in language comprehension.

This paper is expected to contribute to the discussion about the relationship of memory and discourse comprehension in L1 and L2 by investigating working memory capacity and the modality effect in a brain-damaged patient with learning deficits. The following sections will present, first, the significance of working memory span tests as predictors of performance in cognitive tasks and second, the impairments observed in brain-damaged patients.

2. Working memory and the span tests

Many studies have been conducted aiming at investigating memory and the role of its components in different cognitive tasks. During the past decades, research on individual differences has demonstrated that the acquisition, formation and retrieval of episodic and semantic memories are dependent on a 'good' working memory and a good functioning of the pre-frontal cortex (IZQUIERDO, 2002). As demonstrated by this literature, there is a relationship between complex working span measures, such as the reading span test (DANEMAN; CARPENTER, 1980; 1983) and various aspects of discourse comprehension.

In their 1980 seminal article, Daneman and Carpenter proposed the Reading Span Test (RST) as a valuable measure of working memory capacity. Conversely to short-term memory measures, like the digit span and the word span which only measure storage, the reading span test engages participants in online processing (reading of a series of sentences) and simultaneous maintenance of the last word of each sentence trial for later recall. Participants' scores for this RST were correlated with a traditional assessment of comprehension (Verbal SAT scores), and they were further correlated with their performance for two specific comprehension tests: fact questions, and pronominal reference questions. In a subsequent study, Daneman and Carpenter (1983) found correlations between the RST and the ability to perceive lexical ambiguity in garden path sentences.

After these first studies using a complex span task to examine the relationship between working memory capacity and reading comprehension, other studies have been carried out and have found significant correlations between span tests and (a) the ability to perceive text structure, and to recall predictive signals and predicted elements respectively (TOMITCH, 2003); (b) the ability of constructing main ideas in L1 and L2 (TORRES, 2003); (c) the ability to generate inferences (BARETTA; TAVARES, 2005); (d) the ability to suppress intrusive thoughts and behaviors (ROSEN; ENGLE, 1998) and (e) the ability to answer questions about simulated radio broadcasts of baseball games independent of the level of domain knowledge (HAMBRICK; ENGLE, 2002). Overall, all these studies have found evidence, that higher spanners are more prone to exhibit a better performance in complex cognitive tasks due to their larger capacity to control working memory processing and storage functions.

More recently, the RST and derivatives of it have been used in neuro-imaging studies of working memory activation (CARPENTER; JUST; REICHLE, 2000; NEWMAN; JUST; CARPENTER, 2002; VIRTUE; HABERMAN; CLANCY;

PARRISH; JUNG-BEEMAN, 2006), and as assessments of working memory capacity deficits in studies with brain damaged patients with different neurological disorders (ALLAIN; ETCHARRY-BOUYX; LE GALL, 2001; FONTANINI; WEISSHEIMER, 2005) demonstrating that it is a good predictor of the degree of storage impairments and language disturbance among those patients.

In the study carried out by Fontanini and Weissheimer (2005), for instance, the researchers observed that an aphasic subject's performance was significantly impaired in the L2 reading comprehension and the L2 syntactic analysis tasks, as well as his performance in the working memory capacity measures. For this study, the authors considered three different measures for working memory: operational-word, reading and syntactic spans; in all the three span measures the scores of the aphasic subject were significantly lower than the scores of the normal subjects ($n=3$), providing evidence of his deficits in working memory capacity and language problems that resulted from damage in the left hemisphere after a stroke (p. 55).

The studies briefly presented above add to a large body of evidence demonstrating the validity of using span tests to measure working memory capacity as predictors of subjects' performance in complex cognitive tasks. We will move now, to the discussion related to the main impairments related to language in brain-damaged patients.

3. Brain and language comprehension

A vast amount of research has been carried out with brain damaged, callosotomized and hemispherectomized patients to provide much of the foundations to what is known about brain functions nowadays (CODE, 1997; SPRINGER; DEUTSCH, 1998; ST.GEORGE; KUTAS; MARTINEZ; SERENO, 1999). Investigators have used different methods and a wide range of behavioral measures in an attempt to identify the role of specific brain regions in language processing (CODE, 1997). Despite some incompatibilities in the results of some of these studies, researchers agree nowadays that both hemispheres work as a team aiming at the comprehension of discourse (St. GEORGE *et al.*, 1999; BEEMAN; BOWDEN; GERNSBACHER, 2000; TOMITCH; JUST; NEWMAN, 2004; JUNG-BEEMAN, 2005, among others).

As is well known in brain lesion literature, the left hemisphere (LH) has been considered for over a century to have the main responsibility for decoding written and spoken input into words. The reason for this is mainly justifiable by the fact that LH damaged aphasic patient presents drastic changes in behavior, such as speech loss (lesions in Broca's area) or meaningless language production (lesions in Wernicke's area). Lesions in the right hemisphere (RH), on the other hand, tend to disrupt patients' behavior in fairly subtle ways, such as: (a) inability to integrate information from different sources; (b) inadequate use of context in the interpretation of messages; (c) inability to understand figurative language; (d) aprosodic speech or speech with no variations in pitch and tone (e) failure to follow conversational rules and (f) production of confabulations.

Raimundo (2004, based on Federmeier and Kutas, 1999) summarizes in general terms, how the left and right hemispheres process information in different ways:

Table 1: Left and right hemisphere functions (RAIMUNDO, 2004, p. 12)

	Left Hemisphere	Right Hemisphere
Thinking	Symbolic, analysis	Holistic, imagination
Focus on	Foreground, specific	Background, general
Aware of	Details	Overall picture
Better at	Structured tasks	Open-ended tasks
Language	Decoding, literal surface meaning	Context meaning, humor, metaphor

As can be seen from this table, the LH is responsible for analyzing structured, specific information, whereas the RH is responsible for the ‘global’ information. This explains why RH brain damaged patients do not present problems in decoding and interpreting literal information, but are unable to make inferences in order to understand a joke for instance.

Besides the hemispheres, the literature concerning brain functions has also proposed that the four lobes of the brain are responsible for different processes of our everyday lives, such as emotions, reasoning, hearing, vision, language comprehension and other responsibilities (STERNBERG, 2000; OCDE, 2003; RAIMUNDO, 2004). The *frontal lobe*, localized around the forehead is subdivided into three parts: the motor cortex, responsible for producing movements; the pre-motor cortex that selects the movements, and the **prefrontal cortex** that is responsible for cognitive processes such as reasoning and planning so that movement and behavior occur in proper time and place. The prefrontal cortex has recently been associated with the localization of **working memory** (CARPENTER; JUST; REICHLE, 2000; IZQUIERDO, 2002; BUCHWEITZ, 2005 and others). The *parietal lobe*, found behind the frontal lobe at the top back of the brain, is connected with the processing of nerve impulses related to the senses; it also has arithmetic and language functions. The *temporal lobes* are found on both sides of the brain just above the ears and are responsible for interpreting and processing auditory and visual input, memory and learning, meaning and language production. The *occipital lobe*, located in the back of the brain, receives and processes visual information that is mapped onto the cerebral cortex in a complex network. This lobe is specialized in word and facial recognition, and is therefore, an important area for reading skills (STERNBERG, 2000; MATLIN, 2004; RAIMUNDO, 2004).

This characterization of functions according to each lobe is generic and tends to be seen as a didactic tool (RAIMUNDO, 2004), “since each lobe is subdivided into interconnected neuronal nets that are specialized in each specific processing of information” (OCDE, 2003, p. 74, authors’ translation¹). Complex cognitive tasks, such as discourse comprehension and production for instance, are dependent on several of

¹ ... já que cada lobo se subdivide em redes interligadas de neurônios especializados em cada processamento específico de informação (OCDE, 2003, p. 74).

these neuronal nets which are localized in different areas of the brain. Any damage in any of these areas or in the connections between them may impair one's capacity of processing and generate different changes in behavior (IZQUIERDO, 2002). Therefore, as the brain is not a uniform mass (CODE, 1997), specific and localized brain lesions may generate different deficits as a consequence of the intricate connection among neurons. Furthermore, the opposite can also occur: it is possible that, through a process called plasticity, the brain may adjust and optimize its operations in the presence of damage (SPRINGER; DEUTSCH, 1998; IZQUIERDO, 2002; OCDE, 2003).

The previous sections presented some of the literature concerning the long interest of researchers in studying memory and its influence on discourse comprehension. The present study is expected to contribute to this discussion by investigating working memory capacity and discourse comprehension in a brain-damaged patient with learning deficits. Special attention is given to the modality effect (aural and visual) and to the language of input (L1 and L2), given the fact that the brain damaged patient was a regular undergraduate student at the moment of data collection and had to attend classes and read materials in both L1 and L2. The subject's comprehension was assessed through multiple-choice questions and free recall. Focusing on the relationship between comprehension, retention and modality, the following research questions are pursued: (a) What is the impact of working memory capacity and comprehension in L1 and L2? (b) Is there any influence of working memory capacity on the mode of input? (c) Does modality play any role in terms of comprehension and retention when the language is L1 or L2?

4. Method

4.1 *Subject*

The subject of this study, from now on, referred to as C.G., is a 39-year old, male subject with a lesion in the occipital lobe. He is a native Brazilian Portuguese speaker and has upper-intermediate knowledge of English. The subject agreed to participate voluntarily in the study.

4.2 *Materials*

Materials consisted of two working memory reading span tests (in English, L2 and in Portuguese, L1) developed by Harrington and Sawyer (1992) and adapted by Torres (2003) and two working memory listening span tests, developed by the researchers of this study. Besides the span tests, the subjects had to read four texts. Two narratives – one in L1 and one in L2 – were read on a computer screen and in order to avoid re-reading, the presentation mode was time-paced, and presented in the middle of the screen. The other two texts were listened to by the subject through loudspeakers. The narrative in English was recorded by a native British speaker (Douglas Blackwell) recorded by CYP Children's Audio Production (1993). The narrative in Portuguese, as well as the listening span tests, were recorded by the researchers.

4.3 *The working memory span tests*

The working memory reading span tests used in this study were those used by Torres (2003) in her research. As explained by Torres, since most studies relate working memory capacity to reading comprehension in L1, she designed a Portuguese and an English reading span test, which were adaptations of Harrington and Sawyer (1992)'s test. Each test contained 42 sentences, ranging from 11 to 13 words in length, each ending in a short noun, one syllable in length in the English language and one or two syllables in length in Portuguese².

The sentences of each of the reading span tests were presented visually on a computer screen one at a time and the subject had to read them silently, then judge whether they were grammatically correct or not, by marking (✓) for correct or (X) for incorrect in a booklet prepared for this purpose. Individual sentences were displayed at a rate of 9 seconds in the middle of the screen. Sentences were presented in sets of increasing length. That is, sentences were divided in 12 sets (3 sets of 2 sentences, 3 sets of 3 sentences, 3 sets of 4 sentences, and 3 sets of 5 sentences). Having read the last sentence in each set, the subject was presented with question marks “?” and were instructed to turn the page and write the words they could remember down.

The listening span tests also contained 42 sentences each and followed the same order of presentation as the reading span tests. The L1 listening span sentences ranged from 10 to 13 words in length, each ending in a two to three syllable-length noun. The L2 listening span sentences ranged from 3 to 7 words in length, also ending in a two to three syllable-length noun. The sentences of each listening span test were read by one of the researchers one at a time and participants had to listen to them and judge whether the sentences were correct or not in terms of accuracy as for instance, “Babies are old” in the case of the L2 span. Having decided if the sentence was correct or not, the subject had to register a (✓) or an (X) in the booklet. In the L1 span, designed based on Torres's (2003) grammatical judgment task, the subject had to decide whether the word order of the sentences were correct or not and write it down in the booklet. Having listened to the last sentence in each set, the subject heard a buzz and was instructed to turn the page and write all the words he could remember on the lines provided on the page. He was presented with 2, 3, 4 or 5 lines on the page, according to the number of words he was supposed to recall.

Before each span test, the subject was provided with a training session and instructed that he could repeat it if he felt the need to. Before the beginning of the test, the subject was told to make himself comfortable in order to start the span test.

4.4 *Comprehension measures*

After reading or listening to each of the texts, the subject was asked to write down everything he could remember about the text just read /or listened to. After this,

² For the visualization of the complete tests, see Torres (2003).

he was presented with four multiple-choice questions related to important information presented in the texts.

4.5 *Texts used in the study*

The selection of the texts used in this study followed basically three criteria: authenticity, length and level of difficulty. The level of difficulty was analyzed in terms of grammatical intricacy (calculated by dividing the number of clauses by the number of sentences) and lexical density (calculated by counting the number of content words and transforming it into a percentage), as proposed in Eggins (1994).

The narratives in English talk about a character (Mr. Happy and Mr. Impossible, both published by World International Limited in 1997) and the things that each one of them is capable of doing. The narratives in Portuguese tell a different version about the origins of wine (Como nasceu o vinho, by Fernandes, 2006) and a Chinese short-story about love and honesty (Conto chinês, downloaded from <http://paxprofundis.org>).

4.6 *Procedures*

Data collection was carried out in two sessions. In the first session, the subject performed the reading span test in L1, reading of the L1 text, recall, and reading comprehension questions. After a short interval, he performed the reading span test in L2, reading of the L2 text, recall, and the reading comprehension questions. In the second session, which took place a week later, the subject performed the listening version of the tests. The subject was told the order of the experiments a priori and was reminded at the beginning of the recall that he would have a 15 minutes time to do it. The subject received a training session before the actual experiment started.

5. Results and Discussion

The subject's scores in the Reading (RST) and Listening Span Tests (LST) can be seen in Table 2. As has traditionally been adopted in the literature, a score of 3.0 and lower in a span test means that the subject is considered a lower spanner and that he is more susceptible to having comprehension problems, due to his limited resources to cope with processing and storing information. When a subject scores 3.5 and up, he is considered a higher spanner, meaning he is more likely to be successful when performing complex cognitive tasks (DANEMAN; CARPENTER, 1980; 1983; SHAH; MIYAKE, 1999; TOMITCH, 2003; TORRES, 2004; BUCHWEITZ, 2005; SCHERER, 2007; BARETTA, 2008, among many others).

Table 2: C.G.'s scores on the Reading and Listening span tests

Reading span		Listening span	
L1	L2	L1	L2
2.5	2.5	4.5	2.0

As can be seen, C.G.’s highest score is related to the listening span test (LST) in L1, showing a very good performance in tasks involving this skill in Portuguese. The other scores show the opposite pattern, leading us to consider the subject as a skilled listener, with high comprehension skills in L1, although having constraints in L2. Observing this data, we could come to some partial conclusions and predictions. We could state that C.G. has high ability to deal with listening material particularly evident in L1, and we could expect good results in the subsequent tasks proposed in this study. At the same time, his worst score in the LST in L2, points to a sort of fragility that may result in a poor performance in the related tasks. Going one step further in the analysis, comparing the results between the RST and the LST, we would expect to find an apparent modality effect, due to C.G.’s high score in the LST in L1. These data could lead us to reason that the subject is a skilled listener in the mother tongue (BADDELEY, 1990; PENNEY; GODSELL, 1999), but not a proficient reader in either L1 or L2.

However, when we look at C.G.’s scores in the related comprehension tasks, as shown in Tables 3 and 4, we started to be suspicious about our first analysis when we compare the subject’s performance. If we consider his score in the LST as a predictor of his comprehension, we would expect a good performance, for example, in the free recall of the listening task in L1 – *Como nasceu o vinho*. Nevertheless, data show a divergent result. From the 123 idea units of this text, the subject was able to recall only 8,13% (see Table 3). Following the LST score in L2, the free recall should demonstrate some problems, but not a completely different story, which was the case in this study. That is, instead of telling a story about a character called Mr Happy, C.G. invented a disconnected story about a rabbit. It seems that, recalling the idea units of a narrative in L2, involving aural input, is a hard task for C.G., which is in agreement with his score in LST in L2.

Table 3: Percentage of idea units recalled per text and mode of input

Reading		Listening	
Conto chinês (L1)	Mr Impossible	Como nasceu o vinho	Mr Happy
(L2)	(L2)	(L1)	(L2)
10.07%	4.26%	8.13%	0

Table 4: Scores on comprehension questions

Reading		Listening		
Conto chinês	Mr Impossible	Como nasceu o vinho	Mr Happy	Average
100%	50%	25%	100%	

Adding a second element to the picture of C.G.’s comprehension, we examine the scores on the comprehension questions (see Table 4). For the L1 text (*Como nasceu*

o vinho) the subject confirms poor comprehension; nevertheless, surprisingly, his comprehension considering the questions to the L2 text – Mr Happy – shows that somehow he understood at least some information, even though he could not reproduce a matching text. It is interesting to note that at the time he finished the recall task, he told one of the researchers, he had written a story for kids. Furthermore, immediately after receiving the comprehension questions and reading the title “Mr Happy” aloud, C.G. showed some discomfort and added that the questions have to do with what he had heard, not his written text. It seems that he realized his misunderstanding and predicted some discrepancies in the text he produced; at the same time, somehow he could recall part of the information to make sense of the questions in order to choose 100% correct answers (see Table 4). The comprehension questions task was done after the free recall on purpose because it was expected that the subject could find clues in the questions to keep them enhanced in his memory.

C.G.’s RST scores reveal a fragile reader and this data is consistent with the results in the free recall of both texts – Conto Chinês in L1 and Mr Impossible in L2. The subject was able to recall 10.07% and 4.26% of 129 and 164 idea units from the mentioned texts, respectively. However, once more, when questions are given, he demonstrates some comprehension. He got a full score in L1, but a partial one in L2. These results are particularly intriguing. As stated previously, and as the results in the RST show, it was expected that C.G. would present more difficulties when tackling the reading tasks as a consequence of his lesion in the occipital lobe, which is specialized in visual information. Nevertheless, when we compare his overall results, we can see that the language being assessed might play an important role for this subject in terms of his recall – observe that he got a 4.26% in recalling the reading text in L2 and a 0% score for the listening text in L2. It seems plausible to infer that C.G. has found strategies, in his nineteen years of living with his impairment³, to overcome his limitations in performance when dealing with language tasks, a strategy that has not worked with L2. This assumption is mainly based on the fact that C.G. had been taking disciplines in an under-graduation language course since 1992, and this fact may have contributed to the development of strategic ways to deal with language information, especially in the aural mode.

The overall results discussed above seem to corroborate previous studies that pointed out that learning implies storage in a relatively permanent basis, and that the two methods to reach this storage are through rehearsal and comprehension (ASCHCRAFT, 1994; IZQUIERDO, 2002; MATLIN, 2004). C.G.’s scores in the memory span tests, recall and comprehension tasks showed some ‘weaknesses’ especially regarding the kind of storage needed to accomplish the learning step. The performance in the RST and LST followed the prediction of fragile recall and comprehension. However, the data showed problems to encode the information obtained, but not to recover at least part of it, if some clues are given, such as in the comprehension multiple choice tasks.

³ Data collection was carried out in 2006.

6. Final remarks

The purpose of this study was to examine whether working memory capacity and modality effects exert any influence in a brain damaged subject's performance in L1 and L2 discourse comprehension. Overall, results demonstrate that there is not a clear relationship between the scores obtained in the span tasks and the subjects' performance in the comprehension tasks. Regarding the first research question of this study: What is the impact of working memory capacity and comprehension in L1 and L2? – we can see there is not a clear picture, in C.G.'s case. While he performed very well in the LST in L1 (score of 4.5), he got a lower score in its subsequent comprehension questions and recall, than in those obtained in the reading tasks where he got a span of 2.5. When one considers the second and the third research questions: Is there any influence of working memory capacity on the mode of input? And does modality play any role in terms of comprehension and retention when the language is L1 or L2? it is possible to state that there is no apparent modality effect, as demonstrated in previous research (PENNEY; GODSELL, 1999). Considering the design of this study, our hypotheses about modality and its impact on retention were not confirmed.

Nevertheless, it is important to have some facts in mind before further conclusions can be made. First, previous research has considered short stimuli such as sentences or sequences of numbers, contrary to this study which dealt with complete texts. It is possible that modality effect only exert such a strong influence on retention when the stimuli is short and does not involve deeper processing such as the comprehension of a narrative. Second, as already argued in previous parts of the analysis, only one brain-damaged subject was considered; so a future study with a larger number of subjects is needed before any conclusive comments can be made.

Finally, in order to have a better understanding of C.G.'s working memory capacity and its relationship on higher cognitive tasks, such as reading and listening comprehension, a broader investigation involving other span tasks – digit and visual – and different genres of texts should take place for a more consistent and deeper overview of his general capacities.

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Online sentence processing by portuguese and french monolinguals and bilinguals

1. Introduction

The present study has been conducted within an international research network devoted to online sentence processing in monolingual and bilingual. The network is led by Michèle Kail (CNRS) and includes team members Kleopatra Diakogiorgi (Patras University) for Modern Greek, Maria Kihlstedt (Lund University) for Swedish, Marguerite Staron and Barbara Bokus (Warsaw University) for Polish, Angela Emmler (Worcester University) for English, and Isabel Hub Faria and Armanda Costa (Lisbon University) for European Portuguese. The main purpose is to analyze the development of linguistic and cognitive competences involved in online sentence processing by Portuguese and French monolinguals as well as by Portuguese/French bilinguals. This study was carried out by means of a grammaticality judgements task. The experimental design allowed us to obtain data on sentences online processing where syntactical and morphological ungrammaticality could be observed: word order inversion as well as morphological agreement violations. Conditions varied according to the ungrammaticality's position in the sentence structure (intra or inter phrase) and their linear place in the sentence (early or late position). The first part of the study consists of a comparative analysis between the online sentence processing by Portuguese and French monolinguals, from 6 to 11 years and adults (KAIL 2004a; KAIL; COSTA; FARIA 2008), where special attention is paid to the grammatical properties of the two Romance languages and to the sentential context that should affect the cognitive abilities required by real time processing. In the second part of the study, using the same experimental paradigm, with Portuguese and French simultaneous bilinguals belonging to the same age groups, special attention has been paid to the processing strategies used in the two languages, where Portuguese is considered to be the dominant language. The purpose is to evaluate how bilingual processing strategies are affected by the dominant language.

The data collected revealed the ungrammaticality detection time (in milliseconds) from the subject's aural perception until his/her answer. The data also showed the degree of accuracy of the subject's detection measured in percentage of errors.

2. Online sentence processing in the Competition Model

In following up the work of MacWhinney, 1987; Kail and Charvillat, 1988; Bates and MacWhinney, 1989; Kail, 1989, 1999; Devescovi, D'Amico and Gentile, 1999; Bates, Devescovi and Wulfeck, 2001; Devescovi and D'Amico, 2005; Staron, Bokus and Kail, 2005, we considered that: (i) natural languages contain linguistic forms which, in being connected with functions allowing utterances to be interpreted, govern the processor and set up conditions causing different linguistic forms to compete among themselves in order to designate the same function; (ii) the interpretation is made on the basis of stronger or weaker and simpler or more complex connections between linguistic forms and functions; (iii) linguistic forms that work as cues which guide the processor, display variable degrees of validity in keeping with their reliability (form/function association), their availability in the language (associated with perceptibility) and their higher or lower frequency; (iv) the occurrence **of processing cues** displaying different degrees of validity when assigning functions, sets up conditions **involving contrast, convergence or competition** hence leading the processor to seize upon conditions **that are more or less conducive to the attribution of structures and to their interpretation.**

In the oral online processing, the system of aural processing connects the linguistic forms (morphological, syntactical, semantic and prosodic) to the functions or meanings, at the same time taking on board information about frequency and position. The processor acts as quickly as possible, integrating each element of linguistic information into increasingly wider structures and are compatible with the information obtained up to the point of integration. This way of working is typically incremental and interactive and has predictable results: (i) the link between cues, which can be made locally, is more advantageous and demands less effort on the part of the processor than the link which is based upon long-distance relationships; (ii) morphological cues may demand less effort to integration than syntactical ones; (iii) any grammaticality problems occurring within a lower structural unit, are more quickly solved than the problems happening within a higher structural unit.

3. European Portuguese and French properties

Portuguese and French are both Romance languages which share some grammatical properties although they also have their own distinct specificities mainly at morphological and syntactical level. We shall now list some of the properties found in Portuguese and French that are relevant to this study.

3.1 *Word order*

European Portuguese is a null subject language. In French, on the other hand, the subject is always realized phonetically:

Quero um café curto. [I'd like an express coffee]
Je veux un café serré
**Veux un café serré*

Both languages have the same basic word order, SVO, in simple transitive sentences although European Portuguese also allows for VSO or VOS, as a focus device. This fails to happen in French.

O professor escreveu o sumário. (SVO) [The teacher wrote the summary.]
Escreveu o sumário o professor. (VOS) [Wrote the summary the teacher.]
Escreveu o professor o sumário. (VSO) [Wrote the teacher the summary.]
Le professeur a écrit le sommaire. (SVO)
**A écrit le sommaire le professeur. (VOS)*
**A écrit le professeur le sommaire. (VSO)*

As far as the distribution of clitic personal pronouns is concerned, in European Portuguese the basic word order is enclitic whereas marked orders are proclitic; in French only proclitics are allowed. Regarding positive and negative structures in Portuguese, negation demands the obligatory proclitic while in French it is a standard requirement no matter what the circumstance (for clitics in European Portuguese, see Mateus *et al.*, 2003).

<i>O osso não está lá.</i>	<i>O cão não <u>o</u> comeu e a menina escondeu-<u>o</u>.</i>			
	Clit	V	V	Clit
<i>[The bone is not there].</i>	<i>[The dog not it ate and the little girl hid it]</i>			
<i>L'os n'est pas là.</i>	<i>Le chien ne <u>l'</u>a pas mangé et la fille <u>l'</u>a caché.</i>			
	Clit	V	Clit	V
<i>L'os n'est pas là.</i>	<i>Le chien ne <u>l'</u>a pas mangé et la fille *a caché <u>le</u>.</i>			
	Clit	V	V	Clit

3.2 Noun phrase structure

In noun phrase structures, whether they are in European Portuguese or in French, nouns are preceded by determinants and they both show gender and number agreement features. In European Portuguese, the noun may be preceded by more than one type of determinant, whereas this is not the case in French.

<i>A menina</i>	<i>La fille</i>	<i>[The girl]</i>
<i>Os meus livros</i>	<i>Mes livres/ *Les mes livres</i>	<i>[The my books]</i>
<i>Estes meus livros</i>	<i>Ces livres/ *Ces mes livres</i>	<i>[These my books]</i>
<i>Estes livros meus</i>	<i>*Ces livres mes</i>	<i>[These books my]</i>

When the head of the NP is a proper name, contrary to Portuguese, French does not allow any article, and only allows for bare-noun constructions.

is a null-subject language, accepts more flexible word order with the subject in post-verbal position in basic declarative sentences, accepts determinants preceding proper nouns, has enclitics as unmarked order for the position of clitic pronouns and shows isomorphism between definite articles, and 3rd person accusative clitics and demonstrative pronouns.

In terms of the availability of processing cues, it is worth pointing out that in the aural mode, there are marked differences between the two languages. If in French, there are fewer verb inflections than in Portuguese, the phonetic form of the article is a lot weaker in Portuguese than in French. In Portuguese the singular definite article is reduced to a vocalic syllabic nucleus [ə] or [u], whereas in French it comprises a consonantal onset and a vowel nucleus (CV): [l ə] or [la].

4. Experiment 1

4.1 *Online processing of sentences by monolingual speakers of French and Portuguese*

In following up research on monolingual and bilingual processing (BLACKWELL; BATES; FISHER, 1996; KAIL; BASSANO, 1997; DEVESCOVI; D'AMICO; GENTILE, 1999; BATES; DEVESCOVI; D'AMICO, 1999; BATES; DEVESCOVI; WULFECK, 2001; KAIL 2004B), we shall be making a comparative study on the data obtained in Portuguese with the data compiled by Kail (2004a) for French. The same experimental paradigm was used in this linguistic study where experimental factors were kept in and the material adapted according to the grammatical properties of the languages under study.

In order to carry out the Portuguese study, the experimental materials were adapted from the existing French ones. They consist of simple declarative sentences where three experimental factors were manipulated, revealing different aspects that were supposed to interfere in the online processing. Working along the premise that the languages' grammatical properties would give rise to distinct conditions for integrating processing cues, ungrammatical conditions were set up at syntactical and morphological level. This factor would be labelled according to the Type of Violation (T) and would be realised at two levels:

– Morphological Violations (T1) – ungrammaticality caused by lack of gender agreement between the Determiner (definite article) and the Noun, and owing to the lack of SU/V agreement. By looking at the root sentence in (1) in Portuguese, and (2) in French, forms a) and b) were derived:

- (1) *Aos sábados, a vizinha enche a despensa depois de ir ao mercado*
- (2) *Chaque semaine, la voisine remplit le frigo après avoir fait les courses au marché.*
*[On Saturdays, **the neighbour** (fem.) filled her pantry after going to market.]*

- (1a) *Aos sábados, o vizinha enche a despensa depois de ir ao mercado.*
 (2a) *Chaque semaine, le voisine remplit le frigo après avoir fait les courses au marché.*
[On Saturdays, the (masc.) neighbour (fem.) filled the pantry after going to market.]
 (1b) *Aos sábados, a vizinha enchem a despensa depois de ir ao mercado*
 (2b) *Chaque semaine, la voisine remplissent le frigo après avoir fait les courses au marché.*
[On Saturdays, the neighbour (3rd pers.sing.) filled (3rd pers.pl.) the pantry after going to market.]

– Syntactical Violations (T2) – ungrammaticality caused by changing the word order: within the noun phrase, by placing the article after its attached noun; within the sentence, by SU/V inversion. See forms c) and d) derived from (1) and (2):

- (1c) *Aos sábados, vizinha a enche a despensa depois de ir ao mercado*
 (2c) *Chaque semaine, voisine la remplit le frigo après avoir fait les courses au marché.*
[On Saturdays, neighbour the filled the pantry after going to market.]
 (1d) *Aos sábados, enche a vizinha a despensa depois de ir ao mercado*
 (2d) *Chaque semaine, remplit la voisine le frigo après avoir fait les courses au marché.*
[On Saturdays, filled the neighbour the pantry after going to market.]

Note that in Portuguese, the SU/V inversion is not ungrammatical as it is in French (see data on Subject inversion processing in Costa 2005).

A second experimental factor has to do with the structural position (P) of the grammatical error in terms of the sentence structure and its constituents. Sentences 1 and 2, (a) and (c) are ungrammatical at the intrasyntamatical level (C1), while sentences (b) and (d) are intersyntagmatically ungrammatical (C2).

The third factor lies in the integrating material hypothesis and in the effect produced by the ungrammatical position (P): at the beginning of the sentence (early, P1) or at the end of the sentence (late, P2). Look at the examples of the same sentences in (e) and (f):

- (1e) *Aos sábados, vizinha a enche a despensa depois de ir ao mercado.*
[On Saturdays, neighbour the filled the pantry after going to market.]
 (1f) *Aos sábados, depois de ir ao mercado, vizinha a enche a despensa.*
[On Saturdays, after going to market, neighbour the filled the pantry.]
 (2e) *Chaque semaine, voisine la remplit le frigo après avoir fait les courses au marché.*
 (2e) *Chaque semaine, après avoir fait les courses au marché, voisine la remplit le frigo.*

As there were three experimental factors, each with twofold conditions, in order to obtain all the conditions in each sentence, we used the Latin square and obtained 8 conditions ($2 \times 2 \times 2 = 8$), which led us to draw up 8 experiment lists. Each condition was instantiated 5 times which gave a total of 40 experimental sentences per list. Each list was composed of 80 test items (40 ungrammatical sentences and 40 grammatical sentences) and 32 fillers. The sentences were recorded by native speakers using the appropriate intonation. The digital recordings were standardised in average duration for each language using the programme *Sound Edit Pro*.

4.2 Sample

As we were working along the hypothesis of the effects of development in online processing, four groups of subjects aged 6;8, 8;6, 10;10 and adults were tested in both languages. There were 16 subjects in each group. All the subjects were native speakers of European Portuguese; the children were all pupils attending state-schools, the adults were all university students; everyone resided in Lisbon. The French-speaking subjects had the same profile, but everyone resided in Paris.

4.3 Method

The procedure consisted of an aural presentation and the subjects listened individually to the recorded sentences, using earphones. The test, which lasted approximately 20 minutes including short intervals for resting, was made operational by using the Macintosh *PsyScope* programme (Cohen, MacWhinney, Flatt, & Provost, 1993). After a short training period using 10 items, the experimental task consisted of making judgements about the grammaticality of each sentence that was heard. Subjects had to decide as quickly as possible whether the sentence was well formed or not and answer by pressing a key that had been shown to them prior to the task (Tunmer, & Grieve 1984a, 1984b; Gombert, 1990; Kail & Bassano, 2003). Two dependent variables resulted from the answers that had been automatically obtained: the time measured between the moment when the grammatical problem was presented and the subject's reaction (reaction time measured in milliseconds); the subject's decision about the sentence's grammaticality or not (*yes/no* measured in percentage of errors). In order to measure the answer time, an automatic timer was included that set the time from the offset of the problem until the moment the subject provided an answer, as exemplified in (1a) below:

(1a) *Aos sábados, o vizinha (!) enche a despensa depois de ir ao mercado.*

4.4 Hypothesis about the online processing of sentences

Bearing in mind that in online sentence processing the morphological, syntactical and semantic information interact in attributing linguistic functions despite the limitations placed on memory and on the perceptive system, three hypotheses were formulated:

- (i) Considering the effects of working memory and of the ability to anticipate based on the integration of contextual information, it may be predicted that grammar violations which happen late in the sentence are detected more easily and more quickly than the violations occurring earlier on in the utterance's phonic sequence and therefore in the sentence structure.
- (ii) The processor works incrementally. Considering the structural effects of the locality of the grammatical violation, the violations at the intrasyntagmatic level are detected more easily and more quickly than the violations occurring between the sentence's different constituents at intersyntagmatic level.
- (iii) Owing to the effect produced by the grammatical properties of each language, we predict that the violations issuing from the most valid cues are detected more easily and more quickly than the violations produced by less valid cues, cutting across all age groups. Owing to the fact that validity is built upon costs, availability, frequency and locality, it may be predicted that grammatical violations involving a morphological component are detected more easily and more quickly than the violations indicated by syntactical cues.

4.5 Results

Table 1 shows the results in terms of mean reaction time in response to the task of deciding about grammaticality and in terms of the percentage of errors in the answer.

Table 1: Mean reaction time in milliseconds (ms) and percentage of errors in the overall answers give

Age groups	French	Portuguese	French	Portuguese
G1 - 6;8	2594ms	2301ms	25,3%	41%
G2 - 8;6	1992ms	2241ms	19,9%	28,2%
G3 - 10;10	1131ms	2192ms	17,9%	21,4%
G4 - Adults	791ms	1288ms	3,7%	11%

In looking at the overall results, the outcomes of development according to age may be seen as regards the correct answers in both of the languages; there is a clear evolution as regards the reaction time particularly in French. When comparing the reaction times and the percentages of errors when processing in the two languages, it may be seen that Portuguese has significantly higher values in both processing time and percentage of error. It may therefore be inferred that when subjects are tested about Portuguese, they need more time to reach a decision, and when they have done so, they are more likely to make a mistake in their judgements about grammaticality than when they process French.

4.5.1 *The effect of a linear position of ungrammaticality in the sentence processing*

Reaction times were calculated in terms of the violations' early (P1) or late (P2) position according to age in monolingual Portuguese and French-speaking subjects. These results are shown in Table 2.

Table 2: Mean reaction times in milliseconds (ms) detecting ungrammaticality in early and late position of Monolingual French and Portuguese speakers; *significant differences

Age groups	French Monolinguals		Portuguese Monolinguals	
	Early position	Late position	Early position	Late position
G1- 6;8	3306	1881*	2598	2004*
G2 - 8;6	2495	1448*	2583	1899*
G3 - 10;10	1185	1078*	2582	1802*
G4 - Adults	903 ms	679*	1478	1098*

Corroborating the results obtained for other languages – French, English and Modern Greek (KAIL, 2004A; 2004B; KAIL; DIAKOGIORGI, 1998) – it may be seen that the early-position violations in the sentence, on average and in both languages, take more time to detect than when they come at the end of the sentence. However, in French, the early-position violations are detected more rapidly, as a possible effect of the subjects' ages or schooling. An early-position violation detection seems to be cut one third during the four-year elapse between 6;8 and 10;10 years of age, and to one quarter in adults. The same effect is not witnessed in Portuguese however, as these native-speakers have only one pattern involving detection during the four-year period of their childhood. It is debateable whether or not this aspect is due to the level of schooling or if, in the end, it is more particularly dependent on the syntactical properties of the language itself. In reality, because European Portuguese is a null-subject language, contrary to French, it is usual for native-speakers to acquire strategies early on in their lives that involve a differentiated awareness about the positioning of the relevant material in the sentence. In the case of EP, this strategy should target late-positioning while in French it tends to depend more on the information coming first, as it is here that information about the sentence grammatical subject may be found. Given the importance of this parameter in the language, it seems likely that the European Portuguese native speakers have learned this rule even before they go to school.

4.5.2 *Effect of ungrammaticality structural position*

The reaction times in terms of the structural position of the grammatical violation were studied – within the phrase (syntagma, C1) or between phrases (between syntagmas, C2) according to language and age groups. The results are shown in Table 3.

Table 3: Mean reaction times (ms) in detecting ungrammaticality in intra or inter phrase position of Monolingual French and Portuguese speakers; *significant differences

Age groups	French Monolinguals		Portuguese Monolinguals	
	Intra phrasal violation	Inter phrasal violation	Intra phrasal violation	Inter phrasal violation
G1- 6;8	2528	2660	2358	2188*
G2 - 8;6	1965	2018	2322	2079*
G3- 10;10	943	1319*	2252	2072*
G4- Adults	669	912*	1291	1280

The effect of the structural position is clearer and more regular in French than it is in Portuguese. As has been seen in previous studies for French and English (LAMBERT; KAIL, 2001; KAIL 2004b; WULFECK; BATES; CAPASSO, 1991; WULFECK, 1993), the violations occurring intrasyntagmatically are more quickly detected. These results support the hypotheses that, in processing, the rapid integration of information taken from the more local structural units is favoured, contrary to what happens to the information that is more evenly distributed. Nevertheless, this tendency does not arise in Portuguese where, except in the case of adults, intersyntagmatic violations are more quickly detected. It should be pointed out that in EP, only one condition – the violation of SU/V agreement – has been dealt with. The SU/V inversion was excluded from the European Portuguese study in contrast with French, where two intrasyntagmatic violations based on agreement and the word order of the article and noun were included. The results obtained for Portuguese, which are different from the results in other languages, lead us to believe that language properties compete with structural restrictions and thus explain such results. It should be stressed that in terms of perceptiveness, one could say that the definite article bears little phonological weight because, as has already been mentioned, it is constitute by a syllable that is reduced to its syllabic nucleus: [v] or [u]. The resulting violations are obviously ungrammatical whether concerned with gender violations (e.g. [u.və.zi.nv]) or word-order violations [və.zi.nv.v], and as such may be imperceptible to hearing. Therefore, the validity of the morphological or syntactical cue is weakened by its reduced availability or perceptive salience.

4.5.3 Effect of morphological and syntactical cues in processing

In studying the effect of the grammatical nature of morphological or syntactical violations, the difference emerges between the reaction time and the accuracy of grammaticality detection, measured in percentages of error.

Table 4: Percentage of errors in French according to the type of violation, the structural position and the sentence position

French	t1c1p1	t1c1p2	t1c2p1	t1c2p2	t2c1p1	t2c1p2	t2c2p1	t2c2p2
G1 - 6;8	10	10	35	32	10	10	32	23
G2 - 8;6	6	3	14	17	9	4	20	17
G3 - 10;10	25	9	15	21	9	8	14	14

Table 5: Percentage of errors in Portuguese, according to the type of violation, the structural position and the sentence position

Portuguese	t1c1p1	t1c1p2	t1c2p1	t1c2p2	t2c1p1	t2c1p2	t2c2p1	t2c2p2
G1 - 6;8	20	20	28	33	9	12	28	29
G2 - 8;6	22	20	37	32	13	12	42	31
G3 - 10;0	19	15	30	27	6	4	37	34
G4 - Adults	10	8	15	20	1	1	67	60

In French, with the exception of the adult group where an irrelevant number of errors occurred, the errors are consistently higher in intersyntagmatic contexts (C2), regardless of the kind of violation. However, in monolingual Portuguese speakers who have tended to obtain a higher percentage of errors than their French-speaking counterparts, they follow the pattern set by French speakers. They have more errors in intersyntagmatic contexts although they also have a higher error rate when detecting gender violations in DET/N (t1.c1); inverse word order featuring DET/N is more efficiently detected.¹

With respect to reaction times, the results are a little different as Table 6 illustrate.

Table 6: Mean reaction times (ms) in detecting the linguistic type of violation of Monolingual French and Portuguese speakers; *significant differences

Age groups	French Monolinguals		Portuguese Monolinguals	
	Agreement violation	Word order violation	Agreement violation	Word order violation
G1- 6;8	2356	2831*	2267	2370
G2 - 8;6	1833	2151*	2180	2363*
G3- 10;10	911	1351*	2170	2235
G4- Adults	555	1026*	1277	1308

¹ It should be noted that higher rates of error occurring in t2c2p1/t2c2p2, have to do with SU/V inversion and in the end, corroborate the case that this construction is both acceptable and grammatical in Portuguese.

In both populations, the subjects' average detection time of violations brought about by sentence word order (of a syntactical nature) was higher than the detection time registered for agreement violations (of morphological nature, in this study). Nevertheless, it is worth pointing out that in the Portuguese sample, detection-time differences among the errors are minimal and in the adult group they are negligible.

Yet again, if we take into account the importance and frequency of null-subject structures in EP, we may raise the hypothesis that if the information taken in the experiment as processed on the basis of its morphological nature, may be processed in European Portuguese and in other languages with the same parameter, in terms of other factors, mainly acoustic and prosodic features. If so, at word level, it would mean a greater cost in lexical processing. At the inter-constituent relationships level, a greater cost is also to occur, if vocalic lengthening is interpreted as a hesitation within the prosodic sentence. This may explain the behaviour of the adult subjects control group which, in French, showed that age was important: adults > 10;10 > 8;6 > 6;8 i.e., adults are quicker than the 10 year-olds, who are quicker than the 8 year-olds who are quicker than the 6 year olds.

In following the same rationale for the Portuguese study, the age difference bears no significance, particularly among the three children's age groups. Be that as it may, it is still possible to query the school's role in Portugal as far as developing the children's metalinguistic competences during their primary-school education. However, before going down this path, it is pertinent to note that the behaviour of both the Portuguese children and the adults is similar to the behaviour revealed in violation involving early positioning (between 2700ms and 2800ms for children and 1600ms for adults) or violations involving late positioning (between 1900ms and 2000ms for children and 1300ms for adults). In the third contrast between the morphological and the syntactical nature of the violation, the processing of syntactic violations is situated at about 2500ms for children and 1700ms for adults, while the mean reaction time as regards the violation which we have interpreted as morphological is situated around 2200ms for children and 1300ms for adults. It seems to us that more than raising the question of the effect of the children's development, this similarity in the behaviour in European Portuguese indicates the likelihood of an intragrammatical relationship with a clear impact on processing, between early positioning and the syntactical nature of the violation on the one hand, and on the other hand, late positioning and the morphological nature of the violation. Particular attention should be paid to this phenomenon in a follow-up study where the stimuli should consist of clearly morphological cues for Portuguese.

Briefly, we may conclude that similarities and differences in behaviour were observed in the two language groups and in the different age groups composing each language.

In keeping with the results obtained in other languages, the effect of linear position was revealed to be the same whether processing was done in Portuguese or in French: **the error placed at the end of the sentence was detected more quickly**

and more accurately than when it was placed early in the sentence. As to the effect of the structural position when detecting ungrammaticality, the Portuguese results contrasted with what has been observed in French and in other languages: subjects were quicker when detecting intersyntagmatic errors than they were when detecting intrasyntagmatic ones. These results should be interpreted in the light of the validity of linguistic cues in each language which would vary in terms of their availability and their aural perceptivity.

In both languages, **the morphological violations were detected more quickly than the syntactical violations**, hence confirming the costs effects in terms of validity and locality. The effect of the child's development as seen in French where there was a gradual reduction in time and in the percentage of errors as the child grew older was not observed in Portuguese. The three groups of Portuguese children showed a very similar pattern of answers – in both time and errors – and only the adult group was different, showing a significant reduction in time.

5. Experiment 2

5.1 *Online sentence processing by bilingual speakers (Portuguese/French)*

Where bilingualism is concerned, of the utmost importance are, we believe, questions to do with the cortical representation of the two languages in terms of a critical period wherein the second language is acquired on the one hand, and on the other, with the kind of context in which it is acquired. If either of the languages is acquired in a more or less explicit educational setting, or in a more or less informal, tacit and implicit way within the family, it is bound to exert an influence on the transfer dynamic between the two languages.

The concept of balanced bilingualism, which is understood in the sense of equivalent knowledge and use of the two languages, is far removed from reality whether we are talking about the acquisition of different linguistic and communicative competences or the incorporation of the principles regulating different situations and contexts of use. Regardless of the biological capacity for acquiring more than one language, the factors governing both the language's contact and use would necessarily be reflected on the acquisition and development of the lexicon, grammar and oral and written communicative practices in each one of them. These aspects would, at the same time, be closely linked to a developing metalinguistic and metacommunicative awareness. Nevertheless, even when considered 'balanced', and when the knowledge of each language is interiorised by the speaker, we cannot state that the processing of both languages is made on the basis of identical or common strategies and procedures.

Therefore, in dealing with simultaneous bilingual subjects, where one language is dominant as a result of the social and linguistic context in which they live, we put forward the hypothesis that the dominant language's processing strategies are applied when processing the non-dominant language. However, differences in the validity of cues in each of the spoken languages may interfere in the processing.

5.2 Method

In Experiment 2, the age groups, the technical apparatus and the materials are the same used in the Experiment 1. All subjects live in Lisbon, Portugal, and are simultaneous bilingual speakers. Their respective parents are native-speakers of either one language, or the other, in this case Portuguese or French, and they have conditions to communicate in either one of the two languages, both at home and outside. In terms of the sample, all the children attend the private French school, Lycée Francês Charles Lepierre in Lisbon (where the school's language of learning is French – the vehicle language – and Portuguese is one of the subjects that is taught – a syllabus language). All the adults are university students at the University of Lisbon. The selection of all the subjects was made through a previously answered questionnaire which lay down the necessary conditions for ascertaining bilingualism.

The subjects were tested twice, once in French and the second time in Portuguese, separated by an interval of one month. The testing order in the two languages was balanced.

Although we were working along the principle of simultaneous bilingualism, the fact that the subjects are living in Portugal makes Portuguese their dominant language since it affords them more opportunity to speak it outside the school and outside their family environments. The subjects are therefore Portuguese/French bilingual speakers where Portuguese is their dominant language.

5.3 Results

Owing to the importance and the large amount of the data obtained, we have reserved for a future paper their detailed discussion, in the light of the theoretical framework within which the study was conducted.

In this study, we shall focus on some of the most noteworthy aspects of the bilingual speakers' observed behaviour, taking into account their similarity, difference or contrast with the data collected from the previous monolingual study in Experiment 1.

Hence, in what concerns the *Effect of the sentence's ungrammatical linear position*, Table 7 shows the violation of early or late position average detection times, according to age groups.

Table 7: Mean reaction times (ms) in detecting ungrammaticality in early and late position of Bilingual French and Portuguese speakers

Age groups	French Bilinguals		Portuguese Bilinguals	
	Early position	Late position	Early position	Late position
G1- 6;8	3438	3417	2834	2468
G2 - 8;6	2029	2189	1923	1845
G3- 10;10	2060	2353	1906	1866
G4 - Adults	1659	1786	1500	1486

It may be seen that, when tested about French, the non-dominant language, the robust effect of position that had been witnessed in the monolingual French-speakers, has now disappeared. On the other hand, we observe a reduction in the mean reaction times in Portuguese, the dominant language.

Moreover, in terms of the ungrammaticality structural position effect, there is no gain in detecting ungrammaticality at an intrasyntagmatic context, as was seen among the monolingual French-speakers. In fact, the answers both for French and Portuguese show that the ungrammatical detection times are lower for the ungrammaticality situated between the phrases than within phrases. Reaction times obtained for Portuguese were always lower than the ones obtained for French, the non-dominant language (Table 8).

Table 8: Mean reaction times in detecting ungrammaticality in intra or inter phrase position of Monolingual French and Portuguese speakers

Age groups	French Bilinguals		Portuguese Bilinguals	
	Intra phrasal violation	Inter phrasal violation	Intra phrasal violation	Inter phrasal violation
G1- 6;8	4016	2839	3178	2247
G2 - 8;6	2628	1589	2252	1541
G3- 10;10	2561	1852	2206	1580
G4- Adults	2095	1350	1746	1245

Finally, the results of the effects of morphological and syntactic cues in processing are shown in Table 9.

Table 9: Mean reaction times (ms) in detecting the linguistic type of violation of bilingual French and Portuguese speakers

Age groups	French Bilinguals		Portuguese Bilinguals	
	Agreement violation	Word order violation	Agreement violation	Word order violation
G1- 6;8	3395	3461	2583	2970
G2 - 8;6	1838	2380	1912	1867
G3- 10;10	2150	2262	1868	1943
G4- Adults	1365	2079	1576	1334

In the results for French, there was a gradual reduction in the bilingual speakers' reaction times for word order violations, while for Portuguese the same speakers showed a gradual reduction only for agreement violations. These two distinct kinds of behaviour in both the languages of the subjects seem to be related to the way they have interiorised the specific features of each language.

If we recall the importance and the frequency with which null subjects occur in European Portuguese, we are able to raise the hypothesis once again that, in the case of EP, and most likely in other languages in which this parameter also occurs, the focus of attention is centred on the verbal phrase and not on the nominal phrase since verbs contain the explicit aural inflection of person which allows the subject of the clause to be interpreted in the verb itself. Only in the case of the 3rd person singular or plural, the interpretation is carried forward to the next nominal phrase.

In this third contrast between the morphological and the syntactical nature of the violation, we observed that in the French processing, the mean reaction times of the youngest subjects (6;8) is situated at a little above three milliseconds for both cases of violation; this falls to around two milliseconds in the adults' reaction time to word order violation and to 1365ms to agreement violations. Indeed, apart from the difference between Group 1 and Group 4 being greater when it comes to agreement violations, the narrowest space between the mean group values for word order violations show that they gradually fall as the subjects grow older. The same kind of behaviour pattern is witnessed in the processing of Portuguese although, as we have already mentioned, it happens significantly less so when dealing with the processing of agreement violations.

The results once again indicate aspects that are connected with the time it takes to become aware and to explicitly learn each of the languages in terms of their particular features. Due to this reason, we shall dedicate future special attention to drawing up and monitoring the perception of stimuli so that they contain clear morphological and syntactical cues for both languages, taking into account their respective specificities and frequency of use.

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Eye movements during reading¹

1. Introduction

In this paper we present the results of a cluster analysis of data from eye-movement during text reading². Two texts with different topics were adopted and two versions of each text were created: one version, corresponding to the original text, acted as a control text; in the second text, syntactic changes in some sentences were introduced. The texts were manipulated and first used by Armanda Costa in 1991 in which she analysed texts read aloud. The aim of the study was to identify the strategies used by the readers when they experienced difficulties in processing texts with different topics and with syntactic manipulations.

In the present study, as in Costa (1991), it is taken for granted that understanding lexis, classifying words according to syntactic categories, integrating these words into syntactic structures and all the other processes necessary to interpret a sentence are undertaken immediately, quickly and nearly always efficiently (COSTA, 2005). According to LaBerge and Samuels (1985), some of these processes or stages are undertaken automatically, thus allowing the reader's attention to be directed to other matters: attention ceases to focus so closely on de-codifying or on the specific mechanisms of reading itself and starts taking into consideration the meaning of the sentence. Nevertheless, there are situations where the automatic response breaks down and the reader is obliged to reformulate or reanalyse his/her initial interpretation. These situations happen mostly when there are complex, ungrammatical or even temporarily ambiguous structures.

Briefly, reading is considered to be an incremental process where the reader interprets the linguistic material (morphemes, words, phrases) as soon as it is found, and so, any difficulty experienced during information processing will have immediate impact. It is assumed in psycholinguistics research that some experimental paradigms can detect and reflect whether the reader has experienced any difficulty during reading. There are several indicators that can be registered and analysed to identify

¹ This study was conducted by Paula Luegi for her Master's thesis under the supervision of Professors Isabel Hub Faria and Maria Armanda Costa. The eye-tracking equipment used in this study was financed by the Calouste Gulbenkian Foundation.

² The results of other analysis may be seen in Luegi (2006) or in Luegi, Costa and Faria (2007).

the difficulties experienced by readers: Costa (1991) for example, studied prosodic variables in reading aloud, such as the duration and locality of pauses, the presence and the duration of hesitations and repetitions, the speed of reading, among other factors; Luegi (2006) studied silent reading, analysing the number and the duration of fixations, the time taken to read the texts, sentences or excerpts of some sentences, the existence of regressions, among other factors.

In order to analyse the different variables which are taken to be more or less direct indicators of the cognitive mechanisms involved in language processing, it is necessary to rely on experimental paradigms that allow us to register (and analyse) these variables. In the experiment we conducted, we used eye-tracking during reading. This technique is based on the assumption that by studying eye movements, we are able to perceive the cognitive processes involved in understanding linguistic information at the moment it is happening (STARR; RAYNER, 2001, p. 156). So, we will begin this paper giving a brief description of eye-movements behaviour during reading.

2. Eye movements during reading and text processing

In 1878/79, Émile Javal, a French ophthalmologist, noted that, during reading, our eyes do not move in a linear way from the beginning to the end of the line but, rather, they move forward in short, very fast jumps that are punctuated by brief pauses. The jumps are called saccades while the stops are called fixations.

When reading, the saccades are called progressive when they move from left to right in Western languages and regressive when they happen in the opposite direction. Regressive movements represent about 15% of all saccades in reading and occur mainly when the reader experiences difficulties during information processing. Due to a phenomenon called saccade suppression (MATIN, 1974), we are not able to perceive whether anything has happened in the visual stimulus when moving the eyes, that means, during a saccade. Saccades have an average length of 7-9 letter-spaces (the characters plus the spaces between the words).

Only during the fixations (new) information is collected and, owing to this, several fixations are made when we are regarding a stimulus. Since the eye has a limited acuity, during a fixation we can only manage to collect information covering a small region: 17-19 letter-spaces. Therefore during a fixation on a line of text, we collect information from the left and from the right of the fixation point. During the reading of Western languages, more information is collected from the right than from the left of the point of fixation and the inverse happens when reading languages that are written and read in the opposite direction. Therefore, the visual field in reading is asymmetrical, with 3-4 letter-spaces placed to the left of the fixation point, and 14-15 to the right. Apart from collecting useful linguistic information for processing from a space 17-19 characters long, called the parafoveal region (covering both foveal and parafoveal vision), we only really extract useful information for word processing

from a space 9-12 characters long, called the foveal region (3-4 letter-spaces to the left and 6-8 letter-spaces to the right).

In reading, the mean fixation duration is considered to be about 250 milliseconds (hereafter referred to as ms). Nevertheless, this measurement is fairly variable. On the one hand, readers with different proficiencies in reading have different fixation durations (more fluent readers are expected to have lower fixation times); on the other hand, the same reader has variable fixation durations depending upon the difficulty of the text being read. Apart from reading proficiency and the overall complexity of the texts, other linguistic factors may influence the duration and the frequency of fixations, such as the frequency of the word that is being fixated, its length and the context in which it appears, among other factors. The syntactic complexity of structures may also be responsible for increasing the duration and the frequency of fixations. However, the influence exerted by these factors is not only reflected in the duration and frequency of the fixations, but also in the direction and length of the saccades, with a likely increase in regressions and in shorter saccades.

It is precisely the differences in eye-movement patterns, which are closely connected to the linguistic characteristics of the stimulus being processed, that make this method so interesting to better understand the way the brain works during language processing. It is assumed that in more complex reading situations, where cognitive processing is overcharged, there is a change in eye-movement patterns that reflect the cognitive processes involved in language processing. Eye movements, therefore, act as more or less direct and valid indicators of the way the brain works above all when the reader has to deal with more complex situations involving information processing of the written language.

3. Experiment

The aim of the statistical analysis we present in this paper is to make an overall assessment about whether:

- (i) Eye movements are sensitive to the syntactic structure of the sentence which is being read.
- (ii) Syntactic complexity causes changes in eye-movement patterns.

More particularly, this study wishes to analyse whether ungrammatical or ambiguous syntactic structures with common properties cause eye-movement behaviours that are similar to one another. Likewise, it is also to see whether grammatical constructions having different properties cause distinct eye-movement patterns. As we shall describe shortly, we contrasted two large groups of constructions: structures involving constituent's movement and structures without constituent's movement, checking to see whether the eye movements registered during reading come within proximity to each other or not.

3.1 *Stimuli*

As stimuli we used two texts that had been previously used by Costa (1991). In what concerns the layouts, the two texts have a very similar textual structure in that both have a title which introduces the topic, they have identical structural information in terms of the distribution of the topics or paragraph organisation, and both texts have a concluding paragraph that is introduced by a rhetorical question. Both texts have approximately the same number of words. Likewise, at the level of linguistic structure, both texts are fairly similar, with the sentence syntactic structures of the same type along the texts.

Despite these similarities, the two texts differ as to the familiarity of their topics. One text is about a well-known topic, *Campo de Ourique* (T1), while the other is about a scientific topic, *O Isolamento termo-acústico* (T2), distant from the reader's universe of reference and, consequently, with less well-known words. This manipulation introduces the independent variable TOPIC.

Two versions of each of the texts were made: a control version (T) and a version in which some syntactical structures were manipulated (T'). This manipulation gave rise to an independent variable, Deterioration of the Syntactic Level (henceforth DSL). The target syntactic structures were chosen on the basis of their grammatical properties in European Portuguese (EP from now on) and they were duly inserted into contexts.

In each of the texts contexts of analysis were singled out. They will be described below (the contexts under study are written in italics and the vertical bars (|) indicate the different regions of analysis: A, B or C):

Context 1 (C1): the clitic was placed in post-verbal position in a relative clause, setting up an ungrammatical situation in EP.

- T1 – o bairro colorido e calmo, | *que se vislumbra* |_A *através dos eléctricos em movimento* |_B
the colourful quiet quarter, | *which (clitic) is glimpsed* |_A *at through the moving trolley-car* |_B
- T1' – o bairro colorido e calmo, | *que vislumbra-se* |_A *através dos eléctricos em movimento* |_B
the colourful quiet quarter, | *which is glimpsed-(clitic)* |_A *at through the moving trolley-car* |_B
- T2 – os múltiplos sons de choque, | *que se captam* |_A *no interior de cada edifício* |_B
the multiple sounds of crashes, | *which (clitic) are captured* | *inside each building* |_B
- T2' – os múltiplos sons de choque, | *que captam-se* |_A *no interior de cada edifício* |_B
the multiple sounds of crashes, | *which are captured-(clitic)* | *inside each building* |_B

Context 2 (C2): the clitic complement of the verb which acts as a direct object is omitted, giving rise to an ungrammatical sentence.

- T1 – A vida deste bairro mundano [...] | *revela-se* |_A *ao virar de cada esquina das suas ruas de passeios largos.* |_B *O casario heterogéneo do bairro* |_C
The life of this mundane quarter [...] | *reveales itself* |_A *at the turn of each corner of it streets with their wide pavements.* |_B *The quarter's heterogenous rows of houses* |_C
- T1' – A vida deste bairro mundano [...] | *revela* |_A *ao virar de cada esquina das suas ruas de passeios largos.* |_B *O casario heterogéneo do bairro* |_C
The life of this mundane quarter [...] | *reveales* |_A *at the turn of each corner of it streets with their wide pavements.* |_B *The quarter's heterogenous rows of houses* |_C

- T2 – A resolução deste problema [...] | *centra-se* |_A *na existência de meios técnicos actuantes na oposição à propagação de ruídos.* |_B *Uma das soluções mais eficazes* |_C
 The solution of this problem [...] | *centers itself*_(clitic) |_A *on the existence of technical means countering the propagation of noise.* |_B *One of the most efficient solutions* |_C
- T2' – A resolução deste problema [...] | *centra* |_A *na existência de meios técnicos actuantes na oposição à propagação de ruídos.* |_B *Uma das soluções mais eficazes* |_C
 The solution of this problem [...] | *centers* |_A *on the existence of technical means countering the propagation of noise.* |_B *One of the most efficient solutions* |_C

Context 3 (C3): where the Subject is in a post-verbal position in a non-marked declarative clause, giving rise to temporary ambiguity because the NP to the right of the transitive Verb may be interpreted as a Subject or as an Object in a null Subject construction³.

- T1 – | *as donas de casa atarefadas procuram os melhores produtos frescos* |_A
 | *busy housewives seek the best fresh produce* |_A
- T1' – | *procuram as donas de casa atarefadas os melhores produtos frescos* |_A
 | *seek busy housewives the best fresh produce* |_A
- T2 – | *o painel ISOLPAN apresenta vantagens excepcionais* |_A
 | *the ISOLPAN panels display exceptional advantages* |_A
- T2'⁴ – | *apresentam os painéis ISOLPAN vantagens excepcionais* |_A
 | *display the ISOLPAN panel exceptional advantages* |_A

Context 4 (C4): where the Verb is in final position in a WH-question with simple WH-morpheme, thus resulting in an ungrammatical structure.

- T1 – | *Como reagem os moradores de Campo de Ourique?* |_A *Receiam que as vizinhas torres do progresso* |_B
 | *How do react the Campo de Ourique residents?* |_A *They fear that the neighbouring towers of progress* |_B
- T1' – | *Como os moradores de Campo de Ourique reagem?* |_A *Receiam que as vizinhas torres do progresso* |_B
 | *How do the Campo de Ourique residents react?* |_A *They fear that the neighbouring towers of progress* |_B
- T2 – | *Como actuam os especialistas em isolamento?* |_A *Defendem que a eleição de materiais e de técnicas* |_B
 | *How do actuate the insulation specialists?* |_A *They argue that choosing the materials and the techniques* |_B
- T2' – | *Como os especialistas em isolamento actuam?* |_A *Refendem que a eleição de materiais e de técnicas* |_B
 | *How do the insulation specialists actuate?* |_A *They argue that choosing the materials and the techniques* |_B

³ Since EP is a Null Subject Language, the manipulated sentence could be interpreted as having a null subject. So, this sentence could have three interpretations: $\emptyset_{\text{Null Subject}} \text{ V O}$; V S O ; V O S .

⁴ In this structure, the number of the first NP has been changed (*the panel* has become *the panels*). We decided to change this so as to set up an ambiguous situation where it is necessary that both the post-verbal NPs agree with the verbal inflection in both gender and number.

In the set of four altered sentences, there are two distinct situations: i) ungrammatical constructions without a direct bearing on interpretation: a clitic in an enclitic position where proclisis is mandatory, and a Subject in a pre-verbal position in a WH-question; and ii) misleading constructions making the reader hesitate before interpreting them, such as, omitting the complement of the verb which may occupy a final position (after the prepositional phrase), or the post-position of the Subject in a declarative sentence where it may be interpreted as an Object in null-subject construction or, correctly, as a post-poned Subject. These constructions, which give rise to disturbances in interpretation, may demand distinct processing efforts that may be visible in eye movement behaviour.

Within each of the contexts, different regions of analysis are established (the values of the contexts are the sum of the values of the regions), indicated by the bars (|) as seen above. These regions have been set up since it is predicted that, firstly, the ungrammatical or ambiguous structures are not always immediately identified in the region in which they occur, but may only be noticed in the following words. Secondly, even if they are detected immediately, some effects of the detection may occur afterwards. In other words, a phenomenon known as the spill-over effect⁵ may occur. Each one of the contexts has been divided into two regions of analysis: Region A and Region B. Region A is the critical region and covers the places where the problem has been set (however, it may not always be detected there – as referred above). Region B is called the post-critical region which covers the words coming after the problem; this is the region where it is hoped that, as extra material is given, the problem will be confirmed and solved, or from where, it is hoped, regressions will be made to the region where the problem originated.

3.2 Participants

The sample was composed by 20 university students or recent graduates. All the participants were native speakers of European Portuguese and their average age was 22 years and 9 months.

The 20 participants were divided into two subgroups: 10 participants read T1 without DSL and T2 with DSL; the other 10 participants read T1 with DSL and T2 without DSL. To avoid effects of order, reading was done alternately: half of the participants of each group read T1 first while the remaining participants read T2 first.

3.3 Procedure

The texts were divided into three parts where each part comprised two paragraphs that were shown on different PowerPoint slides and presented on a computer screen.

⁵ Reading time on a word may be increased by difficulties in the processing of the word before, indicating that the processing of that (complex) word was not finished when it was abandoned and a new word was fixated.

As the texts were being read, the participants' eye movements were registered by an ASL 504 Model working at a recording speed of 60 Hz. This is a remote-controlled system comprising a camera, placed under the screen showing the texts at a distance of 60cm from the participant, and that emits an ultraviolet ray of light which creates two reflection points: one on the cornea and the other on the pupil. The position of the eye is calculated on the basis of the distance between these two points (when the eye moves, the distance between the reflexion of the pupil and the reflexion of the cornea changes). To avoid head's movement, we used a chin rest.

Before the experiment was started, the participants were told about the procedure. They were told that they were going to read the texts shown on the screen and that, since they had to read and understand the text, at the end of each text they would answer some questions about what they had just read. After the instructions had been read and explained in detail to the participants, the equipment was calibrated⁶ and then, in order to check whether it was working properly, participants read a small sample text. If needed, the equipment was adjusted or if it was satisfactory, the task was begun.

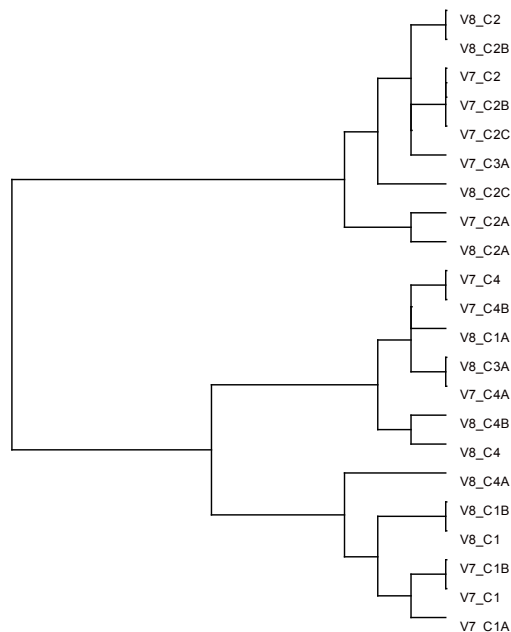


Figure 1: Dendrogram Campo de Ourique

⁶ So that the correct position of the eye of each participant is obtained, it is necessary to calibrate the system at the beginning of the test. To do this, the participant has to look at 9 numbered points on the screen (which coordinates are pre-defined). The eye's position is then registered when it fixes upon each of these points. Afterwards, the system calculates (according to the vertical and horizontal coordinates), the position of the eye and its movements on the basis of these key-points.

3.4 Cluster analyses results

Owing to the lack of space, we will present only the results of a multivariate data analysis, in this case, the Cluster Analysis (for more details, consult Luegi (2006)). The Cluster Analysis allows us to group into classes the conditions that resemble each other the most and that consequently are closer to or related to one another (the result is presented on a dendrogram). Hence, we may see under what conditions the participants' behaviour resembles one another. For example, whether or not there is any similarity among the participants when dealing with the same structure, or whether there are similarities between behaviour upon reading different structures and what sort of structures cause behaviour to vary the most.

As dependent variables, we analysed the Total Reading Time – V7 – in the region (A, B or C⁷) or in the context (C1, C2, C3 or C4) and the Number of Fixations – V8 – done in a region or context.

Next, we will present the various dendrograms for each text, as well as the data analysis together with a brief summary explaining the different classes that emerged. The dendrograms should be read from right to left: the sooner a class is formed, the closer (more related) are the variables in that class.

3.4.1 Analysing the contexts in *Campo de Ourique*

In the dendrogram of *Campo de Ourique* **without any Deterioration at Syntactic Level (T1)**, presented in Figure 1, the formation of two large classes is clear: one of the classes contains the variables of Context 2 and Context 3; the other class gathers together the variables of Context 1 and Context 4.

If we look at these sentences' syntactic structure, we see that they are both, Context 2 and Context 3, canonical structures (Context 2 – [S V Ocl] – and Context 3 – [S V O]), where there was no constituents' movement. In contrast, in the structures in the second class (Context 1 – [que Ocl_i V-t_i] – and Context 4 – [WH-_j V_i S t_it_j?]) there was constituents movement. Apart from the constituents' movement, another common feature shared by these two structures lies in the presence of a WH-morpheme.

Furthermore, in the second class two sub-classes are formed, one grouping the variables of Context 4 (with the exception of one, the Total Number of Fixations done in region A in this context (V8_C4A), which is grouped together with the variables of Context 1), and a second sub-class grouping the variables of Context 1 (with the exception of the Total Number of Fixations are done in region A of this context (V8_C1A), which is grouped together with the variables of Context 4). In the syntactic analysis⁸ of these two structures we see that despite the fact that there is constituents' movement in both structures, in Context 1 the constituent that moves is the clitic complement of the Verb, while in Context 4, it is the Verb, a nuclear constituent in

⁷ Only Context 2 has region C.

⁸ We do not wish to make an exhaustive syntactic analysis here but merely give a superficial description of the position the constituents occupy in the sentence.

the sentence. On the other hand, if we consider the presence of the WH-morpheme hypothesis, we see that although both structures have a WH-morpheme, in one case this morpheme is an interrogative, while in the other it is a relative. Whatever the case, at processing level, these two structures seem to be dealt with differently no matter what explanation is taken into account.

In these results, we may see that during the reading of the two canonical structures, there is no difference in eye-movement behaviours because these sentences have a very similar syntactic structure. Regarding the structures with moved constituents and with a WH-morpheme, differences distinguishing one structure from the other may be perceived in eye-movement behaviour during reading.

In a more detailed analysis, we are also able to see that the variables Total Reading Time (V7) and the variables Total Number of Fixations (V8) are nearly always grouped together with the exception of two cases. In other words, in most cases, the values obtained in the Total Reading Time in one context (or region) are linked to the Total Reading Time in another context (or region) and only in two cases do the Total Reading Time values join the Total Number of Fixations done in another region of context. These results indicate that the analysis is sensitive to the nature of the variables.

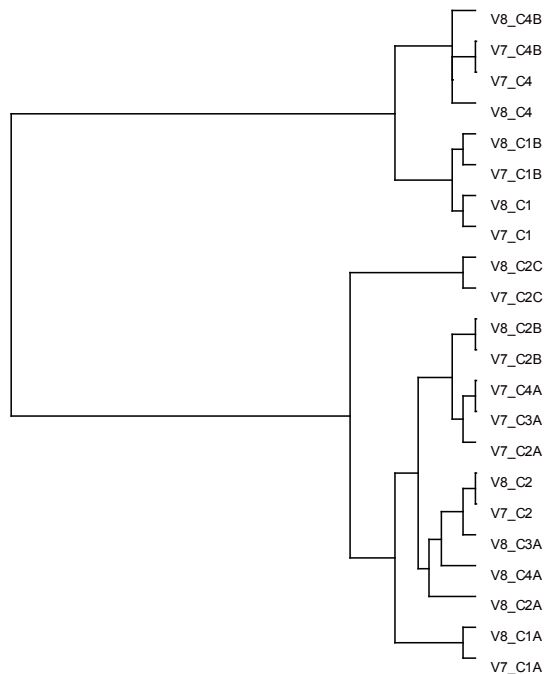


Figure 2: Dendrogram Campo de Ourique with Deterioration at Syntactic Level (T'1)

As in the previous dendrogram, in the dendrogram of *Campo de Ourique* **with Deterioration at Syntactic Level (T'1)**, in Figure 2, two large classes are evident. In the first large class are the variables of Region B (the post-problem region) of Context 4, the variables of Context 4 in general (Region A and Region B), the variables of Region B of Context 1, and the variables of Context 1 in general. Two sub-classes were also found in this class: one composed of the variables of Context 4 and the other consisting of the variables of Context 1. In the second large class there are the variables of Regions A of Contexts 1 and Context 4 and all the variables of Contexts 2 and Context 3. In these two last contexts, there was an internal movement of the constituents ${}^?[V\ S\ (X)\ /\ V\ (X)\ S]$ and ${}^*[S\ V\ __\text{OD-cl}]$ ⁹, an effective movement in Context 3 and an apparent movement in Context 2. We deemed Context 2 to be an apparent movement because we believed that when the reader fails to find the internal argument after having read the verb, he/she interprets the structure as if the internal argument had been moved to a place nearer the end of the sentence. However, this interpretation becomes wrong, at the end of the sentence.

In analysing the classes that were formed, we can see that the first class gathers together the post-problem regions, where no serious changes are expected, and the variables of both Contexts, which seems to indicate that the values of the context itself are mostly a reflection of the values of Region B and not of Region A.

All the problematic regions are grouped together in the second class. If a context-by-context analysis were made, it would be seen that in Context 1 ungrammaticality occurs in Region A and it is there that it may be detected (involving local detection). The same thing happens in Context 4. Where Context 3 is concerned, the whole of the structure is ambiguous (it has only one region). Despite the ungrammaticality introduced in Region A, in Context 2, it may only be detected in the next region, that means, in Region B (we shall be talking about Region C further on), this detection has an impact both on Region A and on Region B. Hence, there seems to be a clear distinction between the region where the problem is detected and the regions where the problem is no longer felt, as in the case of Region B in Contexts 1 and Context 4.

In the dendrogram in Figure 2, contrary to what happened in Figure 1, a distinction between the different kinds of syntactic structures does not seem to exist. Nevertheless, if we examine the second class, we may see that the Region A variables in Context 1 are only grouped together with the others at a later stage. This is why there seems to be some sort of distinction between the processing of this structure and the processing of the other structures. As regards grouping Region A variables of Context 4 with the variables of Contexts 2 and 3, it seems to indicate that the structure was processed as a declarative sentence.

As for Region C in Context 2 (C2_C), in a contrastive analysis involving the contexts in the *Campo de Ourique* text and those in *O Isolamento termo-acústico*, we

⁹ At first, this structure is ambiguous but when reading has finished, it has become wholly ungrammatical due to the absence of a compulsory constituent. This explains the symbol * .

verified that this structure of *Campo de Ourique* has higher values than the equivalent structure in *O Isolamento termo-acústico*. The difference is statistically significant. Therefore, the fact that it is different from all the other structures may be explained by its complexity in relation to the other structures (in this case, not syntactically but lexically and perhaps also phonologically more complicated)¹⁰.

3.4.2 Contrast between the *Campo de Ourique* dendrograms

By contrasting the *Campo de Ourique* dendrograms with and without DSL, we see that the dendrogram without DSL has been reorganised when compared with the text with DSL and gives rise to distinct classes being formed. However, in both dendrograms, the organisation seems to be syntactically motivated: whether or not the sentence constituents have been moved (which in the second dendrogram causes the variables in Context 1 to separate from the other variables). When analysing the first dendrogram, we considered that the grouping of Context 1 with Context 4 may be due to the presence of a WH-morpheme in both sentences. However, this hypothesis seems to be challenged by the second dendrogram as these two structures fail to get together again here (Context 1 is different from Context 4 and the remaining structures).

Anyway, as witnessed in the results, the eye-movement behaviour seems to depend upon the sentence's syntactical characteristics.

3.4.3 Analysing the contexts in *O isolamento termo acústico*

In the dendrogram of *O Isolamento termo-acústico* without DSL (T2), shown in Figure 4, three distinct classes are formed. Similar to the dendrogram of *Campo de Ourique* without DSL, the first class is made up of the variable of the two contexts containing canonical structures without the WH-morpheme, or in other words, it is composed by Context 2 ([S V O]) and Context 3 ([S V Ocl]). Similar to *Campo de Ourique* without DSL, Context 1 and Context 4 are distinct from each other, although here it emerges more clearly because each one forms an isolated class and not a sub-class that belongs to the same class. It seems to confirm the hypothesis that, despite having both structures constituents' movement, the fact that the movement has to do with different constituents (nuclear *versus* non-nuclear) means that the processing of the structure is made in different ways. Another explanatory hypothesis of why the two classes have been formed lies in the presence of a WH-morpheme in both of them, an interrogative morpheme in one and a relative in the other. In general, there is a change in the behaviour of eye movements due to the internal structure of the sentence being read.

In the dendrogram of *O Isolamento termo-acústico* **with** Deterioration at Syntactic Level, in Figure 5, and similar to the others, two large classes have been

¹⁰ This same structure, in Costa (1991), registered some interesting behaviour in the form of a large number of hesitations and changes in production, influenced by the word coming immediately afterwards (*casario heterogéneo*), causing [kazariu] to become [kazáriw] or [kazaráriw], for example.

formed which emerge much more clearly than in the other cases: the first is composed of the variables of Contexts 2 and 3 while the second class consists of all the variables of Contexts 1 and Context 4. In this second class, there are also two sub-classes, one consisting of all the variables of Context 1 and the other containing all the variables of Context 4.

In looking at the way the classes have been formed, we see that the variables are grouped together accordingly to the syntactic structure in which they have occurred. One of the classes is composed of structures in which the problem was not immediately detected. Another class, as in the dendrogram of *Campo de Ourique* with DSL, is made up of structures where there was no constituents' movement, which was obligatory.

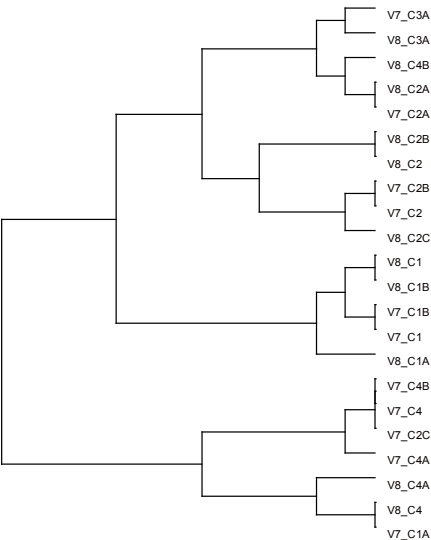


Figure 4: Dendrogram of *O Isolamento termo-acústico* without DSL. Variables V7 (Total Reading Time) and V8 (Total Number of Fixations) in regions A, B and C in the different contexts of *O Isolamento termo-acústico* without Deterioration at Syntactic Level.

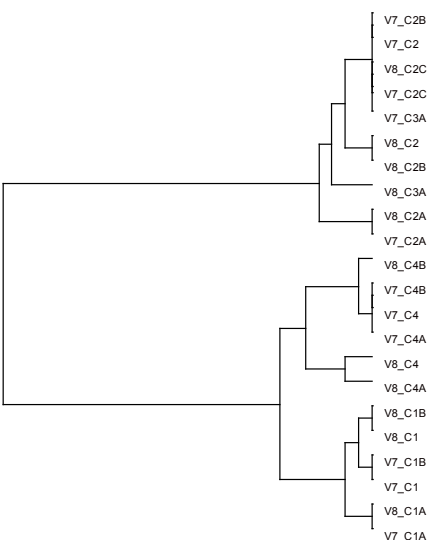


Figure 5: Dendrogram of *O Isolamento termo-acústico* with DSL. Variables V7 (Total Reading Time) and V8 (Total Number of Fixations) in regions A, B and C in the different contexts of *O Isolamento termo-acústico* with Deterioration at Syntactic Level.

This dendrogram shows the distinction between the classes most clearly owing to the fact that all the variables are grouped together according to the context they belong to. For example, there are no Context 1 variables in the class that mostly consists of Context 4 variables, as happens in the previous dendrograms. Only Context 2 and 3 variables are grouped in the same class, as always happened in the previous dendrograms.

3.4.4 Contrast between the *O Isolamento termo-acústico* dendrograms

In contrasting the dendrograms of *O Isolamento termo-acústico* with and without DSL, we see that there are similarities between the two: reading behaviours are distinguishable according to the characteristics of the syntactic structure under study, and on the basis of whether the constituents have been moved or not and what type of constituents have been moved (nuclear *versus* non-nuclear), as well as whether or not ungrammaticality / ambiguity is detected immediately. In these dendrograms, it seems likely that the WH- morpheme is once again a distinctive element, due to the fact that structures containing the WH- morpheme gather together and stand out from the other structures.

Nevertheless, despite the two dendrograms being fairly similar, they differ in matters of class cohesion. In the dendrogram showing *O Isolamento termo-acústico* with DSL, the classes become very cohesive quite early on and are composed only by the variables occurring in a single context (with the exception, as we have already pointed out, of the variables of Contexts 2 and Context 3 that are always grouped together).

3.5 Discussion

From the cluster analysis, we can draw some fairly interesting conclusions which may only be obtained by this sort of analysis. We may therefore conclude that the eye-movement behaviours of the participants during reading depend also upon the syntactic characteristics of the structure we are analysing, no matter what the possible explanations are: the one of movement or the one of presence/absence of the WH-morpheme. Where movement is concerned, we believe that the behaviours differ if reading has to deal with a structure with or without internal constituents' movement, the characteristics of the constituent which has been moved, and whether detection is more or less local. If we consider the second hypothesis, the one of WH-morpheme, it is assumed that eye-movement behaviour would vary if the WH-morpheme is present or not, and if the constituent is an interrogative or a relative. Whatever the case, the results allow us to confirm what we had suspected at the beginning of our analysis: eye-movements behaviour is sensitive to different syntactic structures.

In terms of the effects of altering the stimulus, the effect of changes between the two texts are more obvious in *O Isolamento termo-acústico* than in *Campo de Ourique*. This means that the TOPIC seems to be relevant in the formation of classes: the less accessible the text is, the more difficult it is to read, the greater the distinction would be between the syntactic structures.

The reorganization of the dendrograms from one text to another confirms the influence of both the DSL effect and the TOPIC effect. The DSL effect was confirmed by the reorganization from dendrograms of texts without DSL with its counterpart with DSL. The effect the TOPIC exerts, on the other hand, is observed in the contrast between *Campo de Ourique* and *O Isolamento termo-acústico*. The association of the

two variables in the more complicated text with DSL gave rise to a greater change in eye-movement behaviour.

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First Language Acquisition

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Gesture and speech in mother-baby interactions: Characterizing first linguistic uses¹

1. Baby's first contact with several gestures

Gestures are very important to an individual's linguistic process, either being a listener or not. During everyday communication, without perceiving, gestures are present in linguistic uses and this would not be different in language acquisition.

Thus, this essay aims at grasping the multimodal functioning of language – gesture and speech – in mother-baby interaction. We consider that gesture and speech are a single system which cannot be separated. This perspective is based on the concept that the functioning of the language is always multimodal (MCNEILL, 1985)

McNeill's perspective proposes that gesture and speech are integrated in the same source of meaning, asserting that the occurrence of gesture along the speech implies that during speech acts two types of thoughts – imagistic and syntactic – are being coordinated, that is, they are constituted of the same linguistic system.

Kendon (2000) affirms that the investigation through a linguistic perspective has not yet developed and with the Linguistics restructure under Chomsky's influence – that brought linguistics studies to some sort of mental science and being its being a real consequence of a language analysis as part of a mental science, with emphasis on the cognitive processes, nowadays gestures studies are renewed for those who are interested in language studies.

Therefore, if the language is put as a cognitive activity and if gestural expressions are intimately involved in acts of the spoken language expression, then it seems reasonable to observe the gestures more closely linked to the cognitive activities. This founds a new way of analyzing the question of relationship between gesture and speech. (KENDON, 1982, p. 49). It is noticed that Kendon (KENDON, 1982) places the gestures studies as cognitive activities. Despite the importance of the pioneer works of this author and the cognitivist focus assigned to him, in this research, we

¹ This research is financed by CNPq through a scholarship. There is also the contribution of Amanda Lameiro Aragão and Andressa Toscano Moura de Caldas Barros, students of the scholarships.

privilege an interactionist; perspective and in this direction there are researches as Laver (2001).

Laver points out the importance of gesture in the interactive process. According to him as we analyze any communicative behavior it is fundamental that we perceive the relation between the idealized abstractions of the communicative intention and the variations of the physical achievements of every individual and among individuals. That is, the difference on what was idealized for the communication and what actually happens. Even though there are common gestures in a speech community, we point out that such gestures may vary from person to person and there are still interpersonal factors that affect each individual and that have to be taken into consideration when describing an interaction moment.

Searching for a definition of gesture, McNeill (2000, p. 1) affirms that it is a term that needs to be explained once we do not have gesture, in the singular, but gestures. He rather put such term in the plural as there are several moments in which we need to distinguish movements commonly entitled as gestures. Thus, the author presents a continuum for some movements called gestures organized by Kendon (1982) and that is known as Kendon's continuum. The gestures that integrate this continuum are: gesticulation, pantomime, emblems and sign language. The gesticulation is characterized as idiosyncratic spontaneous movements of the hands and arms during speech; pantomime are gestures that simulate actions or characters performing actions – it is the representation of an individual act; emblems are the ones culturally determined such as the pointing in language acquisition which is a social act as the individual calls the other to contemplate with him the object he has pointed to; sign language as a linguistic system from a community, in our case LIBRAS².

Considering the relevance of mother-baby interaction to language acquisition, we know that it is through the verbal and gestural production of the mother during the interaction that the baby is going to be presented to different kinds of gestures. In this period of the baby's life that goes from the birth to the "nine-month revolution"³, the mother's gestural production is extremely important as it is through this that the baby is introduced to several types of gestures.

Despite the baby's lack of gestural production in a systematic way, it is observed several times that the baby interacts with the mother's gestural productions. Usually these interactions are staring at the mother's direction or through her gestural move followed by a smile.

2. First gestural productions

It is during the turn from eight to nine month when the babies start to present cognitive competence specific from the specie that mother and baby begin to perform

² Brazilian Sign Language.

³ Term used by Tomasello (2003) referring the cognitive and linguistic changes presented by the child in this age group.

the joint attention process, which emerges from other individual's comprehension as intentional agents.

According to Tomasello (2003) it is in this stage that the baby begins to see the others as intentional agents like him and begins to comprehend the relation between action and result and the intentional acts of others. The beginning of the baby's production usually happens after the mother's primary encouragement, that is, after the mother's gestural production. In a second moment, as the sensory motor system develops and time passes, the child is able to produce his own gestures without the mother's primary encouragement. In fact, in this second moment, it is the child through his production that calls the mother to the interaction. Although the child takes the chance, the mother's encouragement after the baby's production still exists and does not lose its importance during the acquisition process as it is through it that the baby is to consolidate the acquired gesture. The baby then performs the gestures in a disorganized way. The pointing gesture, for instance, it totally out of order, the fingers are semiflexed and the hand partially opened. As time goes by, with the mother-baby interactions and the sensory motor system development, the baby performs the gestures more accurately and intensely – that is, gestures throughout time are to be produced more and more closely to the adult structure.

The situations below, extracted from two mother-baby dyads from eight to seventeen months, show how the types of gestures proposed by Kendon in his continuum appear during these first steps towards gestural production.

Gesticulation

This first kind of gesture is characterized by the movement of some of the baby's body parts, for example, head, hands and arms, beginning from eight months of life, during the life span of the first nine months. It is after this first gesture that the child will start to produce other gestures. This process is initiated by the mother's interaction, which is one the most relevant elements in the construction of the baby's gestures. In the second moment, the child herself will try as well as other gestures and the process only begins with an attempt in which the movements are done in an awkward way. Later it is produced on a concrete form and it gets better during the gesture production.

In this situation, extracted from dyad C⁴ the child not only reacts to the encouragement of her mother, but also begins an attempt to produce the gesture. The child that is now eight months and eight days, and through a playful context tries to show gestures through arm movements in an awkward way. The mother's request is identified as the start line for the gesture production by the baby.

⁴ The dyad is part of the *corpus* from LAFE (Speech and Write Acquisition Laboratory) which has eight dyads ordered by letters (A to H).

Example 1:⁵

MOTHER	BABY
(1) The mother claps both hands (palms), then she sings the song (frevo) and then looks at the child during the gesture. (3) <i>What? Let's dance carnival?</i> (<i>qui foi? vâmu dançá carnavau?</i>)	(2) The baby in a first moment is looking at her pacifier, after the mom's first gesture the baby starts looking at her hands. At this moment, they baby tries to make the same gesture swinging arms, clapping hands in a continuous pace.

In this example of Dyad C, we have mother and baby (8m & 8 d), playing on the floor, facing each other with toys around them. In this playful context the mother sings a song and her child will make some gestures through the movement of arms in an awkward way.

Example 2:

MOTHER	BABY
(1) The mother tries to take an object from baby's hands. (3) <i>Hum? Gi'me. Aren't you gonna say no to me?for sure. I'm trying to get to you and you won't say no to me?.Hum?</i> (<i>hum? mi dê nãu vai briga cumigu decididamenti. tô te provocandu, e você nãu vai brigá cumígu.hum?</i>)	(2) When the baby notices that the mother has taken the object, he looks at her and begins to swing her arms with hands open in an awkward way up and down and to the sides. Baby: <i>Ã: Ã:</i>

Pantomime

The pantomime is a gesture that develops especially in the gaming context, in which the mother interacts with the baby through games and toys. This production

⁵ In all examples there is a description of the situation and the gestures and a transcription in italics.

appears during the child's first nine months and then at one year old. The baby starts to perform her own pantomimes without the mother's encouragement. In a certain way, the pantomimic gesture from the mother invites the baby to participate in the interaction and produce the gesture. Even when the baby already produces the gesture, the mother's reinforcement incentivizes the child to produce the gestures.

In this first pantomimic situation from the Dyad C, we notice that a child, at nine months and ten days, has the incentive to "pretend" that her hand is a telephone and to pretend she is holding a conversation. When the mother notices the child's intentions, then she gets the toy phone and begins to simulate a conversation over the phone as well, and then she hands it to the child and pretends to be talking on the phone again, but this time with a toy.

Example 3:

MOTHER	BABY
(2) The mother simulates through an object, a phone talk with the baby's dad. <i>Helo, dad? (Alô, papai?)</i> After the simulation, the mother gives the phone to the child.	(1) The child puts her hand in her ear pretending to be a telephone handset. (3) Child gets the phone again and pretends a conversation again. She says: <i>À::</i>

In this next example observed on dyad B we have a child (one year old, three months and twenty-two days) and a mother interacting in the room with many toys. The baby gets his towel and begins to clean the furniture in the living room. The mother's interpretation of this action is very relevant in this situation for it will make the child to consolidate the pantomimic gesture.

MOTHER	BABY
(2) The mother notices that the baby is performing the pantomimic gesture and asks: <i>Are you cleaning? (Tá na faxina, é?)</i> . In this moment we notice the interpretation by the mother to the baby's gesture.	(1) In the first moment, the baby gets his blanket and begins to clean the furniture. (3) After the mother's interpretation the baby goes back to doing his pantomimic gestures, pretending that she was cleaning.

Emblems

In the language acquisition process, one of the emblems that mostly occur is the pointing gesture. During the acquisition of a language the act of identifying or pointing brings an idea to show the desire of giving information about the pointed object. We see in Cavalcante (1994) that the reference process inside of the language acquisition process presents itself with two objectives: one of declaring and one of identifying. However we cannot identify specifically which one of the two is being used by the child when she points at something.

As other emblems pointing does not show a definite form in a child, but it is shown in a continuous way. In the first steps of a child, regards the production of this emblematic gestures, we notice that it is presented in an awkward form. The hand generally is partially opened and the fingers semiflexed. According to Cavalcante (1994), there are some titles to the pointing gesture and the most frequent ones are: the explorer pointing (touching object), pointing with whole hand and pointer half straight. As the sensory motor system develops the conventional pointing (pointer direction to object) appears. The output of pointing gestures appears during the nine months revolution but it is still performed in a disorganized way.

In the sample below we have a child – eight months and eight days – and it shows the communicative power of this gesture and its output. In this sample of Dyad C, the act of pointing is not well defined; the production of this emblematic gesture is still done in an awkward way.

Example 4:

MOTHER	BABY
(2) When the baby stretches her arm to touch her reflex in the mirror the mother notices that and gets closer to the mirror with the child in her arms and says: who is it? <i>Who is it? (Quem é?é:)</i>	(1) The baby stretches trying to touch her reflex in the mirror. (3) When the baby touches her reflex in the mirror she starts to bang on the mirror with the right hand opened. (4) After touching the mirror the baby looks at the camera through the mirror pointing with an open hand. She turns around looks at camera pointing with a straight hand at it and then continues to look at the camera through the mirror.

In this second sample of dyad B, we have the output of conventional pointing; the child is one year and five months old and makes the pointing gesture with an arm

extension and the pointer finger facing the object. In this situation, the baby used the gesture to point to the mother's desire.

Example 5:

MOTHER	BABY
(2) The mother understands the baby's request and gets the toy and asks: which one? <i>This one?</i> (<i>qual é? Éssi?</i>)	(1) The baby points with a closed fist and the pointer straight (conventional pointing) to the object that is on top of the table. (3) After the mother speaks the baby keeps pointing at another object until she understands that the baby wants another toy.

3. Survey on gesture production per age

Through the observation of two dyads (C and D), between eight and seventeen months old, in interaction situations, we analyze the intensity and the beginning of each type of gesture by Kendon (1982) in his continuum. In this quantitative analysis it is presented – in occurrence numbers – the amount of gestures per age.

Comparing both dyads, the gestures begin to appear from eight to nine months and in both dyads the most frequent gesture were the emblematic ones specially the pointing gesture.

Gesticulation appears as the basis for the production of other gestures. As the mother's pantomime increases the baby's production also increases. This type of gesture depends directly on the mother's encouragement: the primary and the consolidating encouragement.

As we can perceive, as the verbal production in this period is still little and pretty much linked to the adult's interpretation, the gesture also is presented in low intensity. It is in this period shown below that the baby is taking his first steps in his gestural production.

Table 1: Gestural production Dyad C

Age	Gesticulation	Pantomime	Emblem
8m e 8d	3	0	4
9m e 10d	0	2	3
10m e 15d	0	0	1
12m e 12d	0	0	1
12m e 29d	0	0	2
16m	1	2	4
17m	1	4	5

In this table it is observed the gestural production of dyad C in which the mother's encouragement is really meaningful. The baby's mother, during the first months, performs a lot of gestures, especially pantomimes. It is perceived that gesticulation and emblems emerge at the same time and pantomimes appear at nine months.

Throughout the months we observe that the emergency of pantomimes and emblems augment as the gesticulation decreases. In this case, we hypothesize as gesticulation is directly linked to the speech flow once it occurs at the same time as speech, its "shy" presence regards to the child's verbal production as he vocalizes or produces holophrases, as was shown in the extracts above. However emblems and pantomimes do not need support of the speech flow, explaining its higher frequency.

Table 2: Gestural production Dyad D

Idade	Gesticulação	Pantomima	Emblema
8m e 13d	1	0	0
9m e 21d	0	0	2
12m e 6d	0	0	2
12m e 28 d	1	0	1
13m	0	0	3
14m	0	0	2
15m	0	1	3
16m	0	0	4
17m	0	1	9

In table 2 we find the dyad's production frequency in which the mother's encouragement is lower than dyad's C. In this dyad there is a minor incidence of gestures compared to dyad C. The gesticulation appears at eight months and thirteen days and from the next month on there are emblems. These gestures are in evidence throughout the months and pantomimes and gesticulations are only in specific circumstances in the baby. It is worth saying that the whole speech of this child is circumstantial which leads to the inexistence of gesticulation: only two occurrences. The dyad's speech is very direct, for instance: "What is X?" and the child points in answer.

4. Final considerations

As seen, the gestures proposed by Kendon (1982) in his continuum are present in the moments of mother-baby interaction. Mother and baby produce emblems, pantomimes and gesticulations. It is by the mother's movements that the baby starts his first steps towards this gestural continuum.

During the baby's way in producing gestures, in the eight to nine months revolution we identify the beginning of the baby's gestural production. At this moment the gestures are produced out of order and with a primary encouragement. The pointing gesture, for instance, produced with semiflexed fingers and the hand is partially opened but it is recognized by the mother as a meaningful gesture.

By the twelfth month, the baby is already able to perform some gestures without the mother's encouragement. Sometimes it is the child who calls the mother to the interaction. However, the mother's production and interpretation of the child's gestures serve to consolidate the gestures as linguistic items.

As we see there is a lot to perceive about the gesture-speech relation in language acquisition. In this essay we aim at articulating theoretical and methodological considerations on McNeill (2000) and Kendon (1982; 2000); comprehending the emergence of the child's first gestures and establishing some connections with the speech production. Instead of considering the individual function of the gesture and speech by the baby we observed the interactive place between mother and baby as a unit of analysis and from where we can conclude that the nature of interactive relation using more or less gesture and speech has a direct relation with the more or less emergence of diverse gestures performed by the baby.

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The importance of the degree of language acquisition, its dynamicity and word order change

In this paper we would like to present our dynamic mechanism of word order change. We perceive language change as an extremely dynamic phenomenon and in order to describe and predict it, we need to apply a dynamic theory of language change. The theory that we would like to propose has to do with language acquisition and its gradual development. We think that the degree of language acquisition plays an important role in word order change. By the degree of language acquisition we mean that language (its particular structures, words, sounds, etc.) can have different degrees of acquisition as time passes and the degree determines what the language looks like. For example, at degree 1 (which is the one extreme of the spectrum, and here the language is of little or no maturity) the word order will be most iconic, that is, VO and moreover the structures will be paratactic and the adjective will be placed after the noun. At degree 10 (which is the other extreme of the spectrum where the language is of high maturity) the language will have hypotactic structures, OV word order and the adjective will go before the noun. Of course, the 1-10 spectrum is hypothetical, as probably fewer grades would suffice.

1. Introduction

Without denying the existence of the influence of other languages on English word order, we will try to demonstrate that a good deal of, or rather most of, the word order change is the result of internal language processes. We will also establish some universal paths through which languages are likely to go in word order change. Moreover, the change from OV to VO can easily be attributed to language contact, as the direction of its operation often coincides with that of the changes typical of a given language contact. It is, for example, very easy to arrive at some mistaken conclusions when language A which is OV comes into contact with language B which is VO. In the case where language A becomes VO, one could easily attribute this particular change to the influence of language B and disregard internal language changes. However, as is often the case, the truth lies in between and one should not go too far in advocating either view to the exclusion of the other. We are thus going to propose a compromise between the two views, and we will look at language contact as the cause of the activation of internal changes in the language, or rather as the cause of the inhibition of the natural drive towards OV patterns in languages. We realize that a great deal of what will be said here has already been said and proved, but some

things will be novel, for example the graphic representation of the phenomenon of word order change, which we will see in a while, or the idea of how the process of language acquisition can be gradable. Moreover, by taking into account the idea of ‘the dynamic aspect of mind’ in word order change, and the ‘gradual development of language acquisition’ we hope to contribute to a better understanding of word order change, and in fact any other syntactic change. We also think that within the context of the dynamicity of mind, the grade of language acquisition can change over time according to the external linguistic situation. Therefore, our view, or rather the universal mechanism of word order change that we are going to propose, is going to be diachronically mobile, elastic, versatile and thus able to accommodate itself to any linguistic conditions that might appear.

2. Basic assumptions

Before we start our discussion of the universal word order change mechanism, we would like to enumerate the basic assumptions that we make here. Thus, we assume that the following universal tendencies are present in word order change:

1. The human mind is dynamic and constantly creates language anew.
2. In Indo-European, the following circularity of word order change can be observed: SVO > SOV > SVO, and in the future probably SOV again.
3. There exists a constant drive in language to place operators before operands (VENNEMANN’s terms) and not the reverse; this process is regulated (inhibited) by language contact.
4. The mechanism of word order change is always the same, but the language material is different over time.
5. Internal language changes are always at work.
6. Language acquisition is gradable.
7. Pronominal objects are the first to appear before the verb, and the last to disappear from that position.
8. Paratactic structures develop before hypotactic ones and not the other way round.

In order to see how the mechanism works, it is best to take into consideration an ideal model of language construction. So let us now have a closer look at it.

3. The dynamic mechanism of word order change

We believe that the starting point for the construction of any language from scratch is that all operands go first, and all operators follow, because operands are more important. Also, as Wittgenstein (2000) points out, in order to describe something, one needs first to name it. In other words, it is not easy to talk about things, objects, actions, etc. when there are no certain names designating them. So let us put ourselves in a situation in which we are dealing with the process of the

construction of a primitive language by the human mind. Supposing that there is no language whatsoever, it must be constructed from scratch, and it can be done so by the human being's inborn predisposition for language. Moreover, humans have at their disposal objects, actions, qualities, etc. to be named in order to talk about them, and we believe that the first names came into being with the following order: 1) substantives, 2) movements, and finally 3) qualities and other attributes. Substantives serve as operands for operators such as movements, qualities and other attributes, whereas movements serve as operands for operators such as the objects to which they are directed. Thus we assume that the primitive language was most likely to have sequences where operands preceded operators, and not the reverse. The sequences were as follows: SV, VO, SVO, N + Adj., and the like; we think that only in such general terms is it safe to talk about the nature of the primitive language and that the members of the primitive community constructed, and then acquired, a language of this type, and they established the linguistic parameters accordingly. Furthermore, at the beginning, the linguistic items were of a minimum degree of acquisition and each of them was treated, so to speak, separately, and no grammar whatsoever existed, and the concentration span of the speakers was not long enough to take in sequences as complicated as that of *operator + operand*. At the same time, all the elements were heavy, where heavy means a small degree of language acquisition. In our ideal model, therefore, it follows that at the beginning of the construction of language, operators always lagged behind operands in terms of lightness, and they tended to remain heavy for a longer period of time because they were of secondary importance and thus appeared later, and probably were used less frequently, which in turn means a smaller degree of language acquisition and greater heaviness. Let us now see the steps made by the members of the primitive speech community in the construction of the first language and its gradual acquisition.

3.1 The process of giving names to objects

Through this process the language user entered the realm of language, which started to have its own laws, regularity and logic. Names of objects (operands) thus came into being, and in order for him to use these operands, they had to be remembered and then acquired; they had different degrees of difficulty, as will be illustrated below. At the beginning, he may have had difficulty, for example, recalling them from memory, whenever he wanted to use them; here he was in the initial stage of language acquisition, or let us call it grade one of language acquisition. With the passage of time, and with the frequency of recalling and use of these names, the grade of the acquisition of these operands changed and became higher: 2, 3, 4, etc., depending on the boundaries we want to give to grade 2, 3, or 4, etc. Also with the passage of time and frequency of use, operands started to become less and less heavy. The same can be said with respect to operators, but, as we have already mentioned, they lagged behind operands in terms of lightness and tended to remain heavier for a

longer period of time. Finally, the language user had no difficulty with the management of those operands, and in the second place operators. At this point we can say that the construction of the primitive language, L1 and L2 acquisition, as well as the process of pidginization in language contact, have a lot in common, but unlike in the construction of the primitive language, the latter processes rely on existing language material and many deviations may appear from the ideal process; as an example it is enough to take the disobedient behavior of the English adjective which is in harmony with the OV order, and not as predicted VO. However, the mechanism remains the same. Let us now have a look at the graphic representation of the different names, both operands and operators, to be acquired:

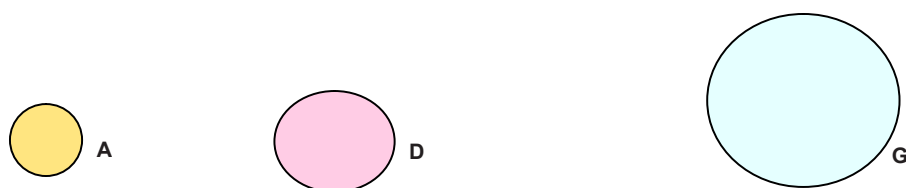


Figure 1: Graphic representation of the different names, both operands and operators

The circles are in fact spheres of a different shape each, and they represent different operands (and in the second place operators) with different efforts needed to be made in order for them to become fully acquired by the human mind. And thus the name G is a long and complicated name, and so needs more time and effort in order to become acquired, whereas the name A is a short word, which can easily be acquired. To continue, let us now represent the human mind as a small sphere X which has the ability to expand and contract back again to its centre in all directions, as is usual of spheres:

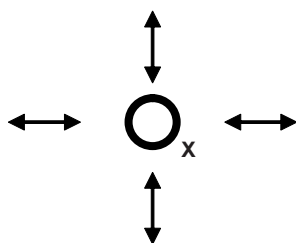


Figure 2: The human mind as a small sphere X

When we place the sphere X in the middle of the sphere (operand/operator) A, D or G, we will see the distance existing between the circumference of X and the circumference of a given sphere (A, D, or G), which will be equal to the distance

needed to be overcome by X in order to acquire those names (see Figure 3); the volumes of the spheres A, D, or G are constant from the synchronic point of view, but they are changeable from the diachronic point of view when we take into consideration all the changes regulating and simplifying languages across longer stretches of time. The moment that the expanding sphere X reaches the circumference of sphere A, D, or G we postulate full acquisition of the names, whereas prior to this the language user would have had difficulty in managing them. Moving further on, after X has reached the boundary of A, D, or G, we can say that they become more fully acquired. Moreover, the dynamic ability of X, according to the frequency of use, allows it to go yet further beyond the boundary of these names, whereby the acquisition grade becomes yet stronger. Let us have a look at the illustration below:

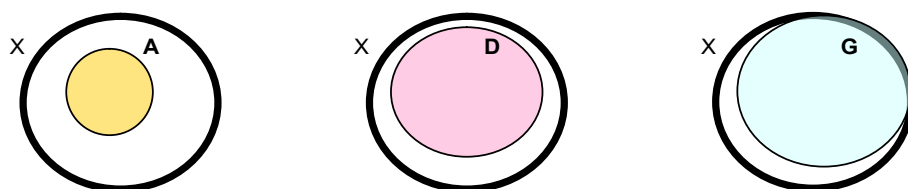


Figure 3: All the operands from a certain perspective

As can be seen, some space between the name A, D, or G and the mind X is being created. Before the X crossed the boundary of the operands A, D, and G, all the operators A, D, and G, comprised a separate thought, were in the second position. Now, however, the created space allows the X to perceive all the operands from a certain perspective, which is equal to its ability to describe them by putting operators before them (operands). At first, only smaller operators with a smaller volume could enter the created space (vacuum), and later on, together with the process of the maturity of language acquisition, when the space between X and A, D, and G became bigger, larger and larger operators (the highlighted areas) could go in. Moreover, from the point of view of language acquisition, smaller operands, for example personal pronouns, prepositions, or other light elements that some linguists qualify as clitics, became mature much more quickly than bigger ones, which implies that they started to be preceded by operators much earlier than bigger operands. So, for example, if the operator was a verb, and the small operand was a pronoun, this resulted in the circumstance that the small operand started to be placed in the second position, which in turn could result in verbal inflexion later on; nominal and adjectival inflexion in language could have had a similar trajectory.

3.2 *The dynamism of the mechanism*

The dynamism of the presented mechanism consists in X having the ability not only to expand, but also to contract and thus move backwards, lessening the degree of language acquisition. This can take place in language contact situations, where the linguistic system becomes relaxed and the language needs to be constructed anew (eg: a pidgin), and so the whole process is repeated, but this time different linguistic material comes into being. We can say that the working of the mechanism resembles the work of a shock-absorber. Furthermore, by this mechanism we can explain why pronominal objects tended to lag behind the general tendency towards VO in languages. They resisted this tendency because of the universal drive towards putting operators before operands, and they were still small enough, or light enough, to squeeze into the smaller and smaller space existing before the operands; this space, however, was disappearing gradually when the linguistic situation grew more and more complicated, and finally it disappeared totally but not equally in different areas of the language. So in other words, for example in Middle English, the practice of placing pronominal objects before the verb was given up because of a further relaxation of the whole linguistic system, together with the loss of flexion, but as the linguistic situation became more stable allowing the maturity of language acquisition, pronominal objects would be the first to appear before the verb and the whole process would be repeated again.

4. Conclusions

Thanks to the mechanism of word order change that we have presented in this paper, we can answer many questions connected with the nature of word order change that recur in literature (see for example McMAHON, 1996). We suggest that the following problematic areas can be explained:

1. Why, where and when linguistic elements become heavy.
2. At what point of language development the change from OV to VO, and other changes that correlate with this particular change, are most likely to take place.
3. That the developments in different areas of language are independent of each other. That all other parameters are reset according to, for example, the change from OV to VO is an indication of the relaxation of the whole linguistic system, and not an indication of the resetting of a given parameter that functions as the leader of other resettings; changes can appear independently in different areas.
4. How inflexion comes into being.
5. Why clitics tend to be placed in the second position.
6. Why paratactic structures develop before hypotactic ones and not the other way round.
7. That there are no 100% consistent languages. This is because different linguistic areas are independent of each other in the process of change, and thus the degree of language acquisition is bound to differ from area to area.

Perfect consistency would be possible at the point of either maximum or minimum degree of language acquisition in all linguistic areas, which is never the case.

And finally, we realize that the dynamic mechanism of word order change that we have presented above is far from being complete and needs more elaboration. Nevertheless, we hope that at least some of the ideas contained in it will be of interest to the reader. Moreover, it needs to be added that the main purpose of the presentation of the above word order change dynamic mechanism is to stress the idea that a word order theory needs to take into account the diachronic aspect of language change. In other words, it needs to be as flexible as possible from the diachronic point of view in order to be able to describe and reflect the true nature of word order changes.

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Cognitive Development and Language Acquisition

1. Introduction

It is argued that language acquisition depends on cognitive development and requires cognitive prerequisites or co-requisites. That is why cognition is seen as an underlying language skill. More specifically, children will not develop linguistic forms, before acquiring the cognitive bases for those forms. For example, the child will learn where-question (location answer) prior to the when-question (time answer), because the concept of a place is acquired prior to the concept of time and this order is cognitively determined. Therefore it is claimed that the order in which specific grammatical structures are required by language learners reflects their cognitive growth which develops before the learners' linguistic development.

The main purpose of this paper is thus to investigate in some detail the cognitive processes involved in language learning in order to determine to what extent they can account for language learning. Appropriate examples and evidences collected from language classes will be presented and discussed to prove the validity of the above claim.

The interrelations between language, cognition, and development have always been a matter of considerable interest to language teachers, applied linguists and psycholinguists. As Dromi (1993) points out, the 1970s and early 1980s can be characterized as "blooming decades" with respect to the number of publications on the nature of the linkage between cognitive development and language acquisition and on the possible directions of influence between these two domains of human functioning. That is why in the last decades, considerable attention has been paid to cognitive accounts of how language learning takes place and the extent to which they can be applied to learning (O'MALLEY; CHAMONT; WALKER, 1987; BIALYSTOK, 1985). Brown (1994, p. 37) argues that there is a relationship between language and cognition. Hatch (1983) also claims that language is only one of the many analytical activities which depend on cognitive development and it is also true that cognitive development and language development may grow side by side in early childhood, an inter-relational model that sees cognition as the basis for language development. Of course evidence in support of this model may be strong in child language research and more data based research in the second language acquisition by adults is needed. Language acquisition is thus seen as having certain cognitive prerequisites or co-requisites. That is why children will not develop linguistic forms before acquiring the cognitive bases for those forms. For example, the child is expected to learn the

where-question/location answer prior to the when-question/time answer because the concept of a place is acquired prior to the concept of time, and this order is cognitively determined. Therefore the order in which particular structures are required by child language learners shows their cognitive growth. Hatch (1983), also claims that there is a parallel development of action and language features and that cognition is a common underlying mechanism for both. According to Felix (1987) different cognitive domains interact in actual language use and there can hardly be any doubt that children's intellectual and linguistic development involves cognitive processes which must in some way be interrelated.

The role of the cognitive processes in the second language acquisition will be discussed and explored in the following sections.

2. Theoretical cognitive framework and models

The major theoretical framework within which the relationship between cognition and language development has been examined is Piaget's theory of cognitive development (PIAGET, 1929, 1952). According to Piaget cognitive development is at the very center of the human organism and that language is dependent upon cognitive development. Piaget distinguishes four major consecutive stages in man's intellectual growth: the sensorimotor stage from 0 to 2, the preoperational period from age 2 to 7, the period of operational stage from 7 to 16, with a crucial change from the concrete operational stage to the formal operational stage around the age of 11. The most crucial stage for the consideration of first and second language acquisition appears to occur at puberty. Cognitively, we can make a strong argument for a critical period of language acquisition by connecting language acquisition and concrete formal stage transition. These considerations suggest that the human mind is equipped with cognitive systems. Cognitive learning theory is another theory which views language learning as a complex skill which involves the use of various information-processing techniques to overcome limitations in mental capacity which inhibit performance (ELLIS, 1992, p. 175). Ellis discusses that the cognitive learning theory is a powerful explanation of how learners develop the ability to use their L2 knowledge. According to Ellis (1992, p. 175) cognitive theory is the result of extensive research into the role that mental processing plays in learning. Ellis then adds that the cognitive theory seeks to explain three principal aspects of learning: 1) how knowledge is initially represented, 2) how the ability to use this knowledge develops and 3) how new knowledge is integrated into the learner's existing cognitive system (ELLIS, 1992, p. 176).

3. Bialystok model

The most developed cognitive theory of L2 learning is that of Bialystok (BIALYSTOK, 1979; BIALYSTOK; SHARWOOD-SMITH, 1985). Like other cognitive psycholinguists who have addressed L2 learning, Bialystok affirms the

principle that language is processed by human mind in the same way as other kinds of information (BIALYSTOK, 1988, pp. 32).

4. Early cognitive development

Ingram (1991) points out that an aspect of the infant's paralinguistic development is cognitive development. By cognitive development he means the infant's growing knowledge of the world around him. Ingram argues that the study of the infant's cognition is of great importance in two specific ways: To understand what the child means by its words, and to explore the role that cognition growth may play in language development. For example, must certain cognitive developments take place before certain linguistic ones may occur? In other words, does the child's cognitive ability limit or constrain, for example, semantic development just as early physiological structure limits the infant's speech production?

5. Cognitive theory and second language learning

Cognitive theory is based on the works of psychologists and psycholinguists. Applied linguists and language teachers working within this framework apply the principles and findings of the cognitive learning theory to the domain of second-language learning (McLAUGHLIN, 1993, p. 133). Their attempts have been based on the assumption that L2 learning is not different from other kinds of complex skill learning. Within this framework, second-language learning is viewed as the acquisition of a complex cognitive skill. McLaughlin (1993) argues that to learn a second language is to learn a skill, because various aspects of the task must be practiced and integrated into fluent performance.

McLaughlin believes that learning is a cognitive process, because it is thought to involve internal representations that regulate and guide performance. Regarding the language acquisition, these representations are based on the language system and include procedures for selecting appropriate vocabulary, grammatical rules, and pragmatic conventions governing language use (McLAUGHLIN, 1993, p. 134). Meanwhile, according to Cognitive theory, second-language learning, like any other complex cognitive skill, involves the gradual integration of sub-skills as controlled processes initially predominate and then become automatic. Therefore, cognitive theory needs to be linked to linguistic theories of second-language acquisition. In fact, as McLaughlin states, learning a second language involves the acquisition of a complex cognitive skill, but it involves the acquisition of a complex linguistic skill as well (McLAUGHLIN, 1993, p. 150).

According to O'Malley, Chamont and Walker (1987, p. 288), cognitive theory suggests that language-related codes and structures are stored and retrieved from memory much like any other information, and that language acquisition follows the same principles of learning as other complex cognitive skills.

Cognitive-code teaching assumes that ‘once the student has a proper degree of cognitive control over the structure of a language, facility will develop automatically with the use of language in meaningful situations.’ (KRASHEN 1982, p. 133). Krashen then states that cognitive code attempts to help the student in all four skills, speaking, listening, reading and writing. Cognitive code also posits that competence precedes performance.

Meanwhile Ellis (1992, pp. 184) suggests:

- a) in developing a theory of L2 learning it is necessary to distinguish ‘knowledge’ and ‘control’ and to take into account both linguistic and cognitive factors.
- b) a cognitive theory is unable to explain the sequence of acquisition of grammatical structures.
- c) a cognitive theory is unable to account for the part played by explicit knowledge and cannot, therefore, fully explain how formal instruction contributes to L2 acquisition.

6. Impact of cognitive load on task difficulty

Cognitive load has also been an explanatory construct for observed task difference (BROWN; YULE, 1983; GIVON, 1985; SWELLER, 1988; SACHS, 1983; HATCH, 1983; ROBINSON, 1995; RAHIMPOUR, 1997, 2007). There are also a lot of evidences in literature, which claims that difficulties are sometimes related to the cognitive load imposed by a task. It is also discussed that cognitive operations are involved in oral narration and consequently part of the complexity and difficulty of tasks lies with the cognitive load imposed by the tasks on learners. That is why it is argued that some tasks are cognitively difficult. Sachs (1983), Robinson (1995) and Eisenberg (1985) argue that the ability to make reference to events in a there-and-then context-unsupported condition involves a number of cognitive operations, conversational abilities and linguistic resources which are not necessary when talking about objects and events that are visible while conversation is taking place. Consequently, the emergence of displaced reference happens much later in L1 than reference to the here-and-now.

It is also argued that young children are cognitively incapable of conceiving of events displaced in time and can only encode reference to the here-and-now. Brown and Yule (1983) emphasize that it is the cognitive load, which is the complicating factor rather than the linguistic form. In line with this idea, MacNamara (1972) proposes that the child possesses nonlinguistic cognitive processes before he learns the linguistic signal. More clearly, Macnamara emphasizes that development of basic cognitive structures should precede the development of comprehending linguistic structures. He adds that just because the acquisition of linguistic structures is spread over a long period, there is no reason that the acquisition of corresponding nonlinguistic ones should also extend well into the period of language learning. MacNamara’s proposal is confirmed by Hatch (1983, p. 219) who argues that language is only one of many

analytic activities which all depend on cognitive development. That is, children will not develop linguistic forms before acquiring the cognitive bases for those forms. For example, a child is expected to learn where/location answer before the when/time answer, because the concept place is acquired before the concept of time and this order is cognitively determined. That is why cognition is seen as underlying language skills. McLaughlin also suggests that second language learning is viewed as the acquisition of complex cognitive skill.

7. Conclusion

The overall conclusion reached was that language acquisition depends on cognitive development and requires cognitive prerequisites or co-requisites. That is why cognition is seen as an underlying language skill. More specifically, children will not develop linguistic forms before acquiring the cognitive bases for those forms. This study thus provides additional evidence to support earlier findings in this domain. The findings of this study also have pedagogic implications in foreign / second language teaching, testing and syllabus design.

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Second Language Acquisition/ Foreign Language Learning

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On the sources of child-adult differences in second language acquisition

1. Introduction

After the Second World War, dramatic changes swept over almost all fields of human activities. The social, economic and educational structures of the Western world, in particular, witnessed new ideologies, policies and practices taking shape. In second language teaching, too, there was a reorientation toward language instruction due to the theoretical rethinking of the great demands of second language education. Structuralism in linguistics and behaviorism in psychology turned out as the two main theoretical underpinnings for what is termed audio-lingual approach to L2 teaching. The two disciplines, however, did not enjoy celebrity long in second language research. Rivers (1964) was the first to question their theoretical basis and soon after both were brought down from the pedestal on which they had been placed. It coincided with Chomsky's book *Syntactic Structures* in 1957. Chomsky upset the prevailing belief that language is learned by imitating, memorizing and by being rewarded for correct linguistic responses. Although these processes have some role in language acquisition, Chomsky's basic argument centered on the innate language acquisition device (LAD) which permits children to acquire the complex language system in a relatively short time.

This view of language learning process inspired a great deal of psycholinguistic research. Looking for evidence of Chomsky's "mental structures", researchers such as Roger Brown (1968) and Slobin (1970) undertook a large-scale investigation, studying uniformities in language acquisition. It turned out that there were some universals of language acquisition common to all children regardless of the language they were acquiring: children produced similar verbal constructions and made similar grammatical mistakes.

While researchers were making great advances in the study of children acquisition of their mother tongue, second language teachers, disillusioned with the shortcomings of both structural and generative linguistics came to rely on their own language experience or intuitive knowledge, hoping to come up with a practical theory

of language teaching. Now with practice leading theory (putting the cart before the horse), researchers advanced approaches to the L2 teaching such as the Silent Way (GATTEGNO, 1972), Community Language Learning (CLL) (CURRAN, 1976), Natural Approach (TERRELL, 1977), Total Physical Response (TPR) (ASHER, 1977), and Suggestopedia (LOZANOV, 1979) in a bid to help the L2 learner master the second language. To them language acquisition is a function of interaction between the learner's mental structure, psychological make-up, and language environment.

2. Biological Factors

There has been a consensus among language teachers and applied linguists that the outcome of adult L2 learning is in some way inferior to that of children (JONES, 1969) and until recently this was explained in terms of behaviorism: success at language learning was attributed to more reinforcement, practice and motivation. Adults were seen, in Oyama's (1982) words, as "the habit-ridden victims of linguistic interference, self-consciousness, weak motivation and inadequate rewards".

In the late of 1960's, largely as a result of work by Penfield and Roberts (1959) and by Lenneberg (1967) on the biological aspects of language, one began to see occasional references to biological-based decline in language acquisition ability toward puberty (JONES, 1969; LAKOFF, 1969; SCOVEL, 1969). Lenneberg (1960, 1967, 1969), with whom we associate the notion of an age limitation on language acquisition, argues that a) there exists a period, lasting roughly from the second to the tenth or twelfth year, during which the child is able to fully exploit its extraordinary capacity to acquire its native language, and after which primary linguistic development is severely constrained, b) children are not only biologically prime learners of their native tongues, but their special state of receptivity extends to non native languages as well, c) drop-off in acquisition efficiency around age 10 affects ability to learn any natural language completely, and d) the development of specialization of functions in the left and right hemispheres, called "cerebral dominance" or "lateralization", begins in childhood and completes at puberty, namely "the ability of the organizer" (DULAY *et al.*, 1982, p. 87), "to subconsciously build up a new language system deteriorates after puberty when the brain's left and right hemispheres have developed specialized functions".

Today Lenneberg's position concerning temporal aspects of lateralization is challenged. Some researchers claim that the development of lateralization occurs by five; others hold that cerebral asymmetry is present at birth, or even before. The two positions have been named "lateralization by five" and "lateralization by zero", respectively. The first hypothesis, "the lateralization by five", was proposed by Krashen (KRASHEN; HARSHMAN, 1972; KRASHEN, 1973), who re-analyzed and produced new evidence to Lenneberg's data, arguing that points 1) and 2) were also consistent with lateralization by five as well as by puberty. Later researchers were able to produce evidence that signs of hemispheric asymmetry were visible in newborns

The notion itself may be rephrased into ‘strong version’ and ‘weak version’. In its strong version, the age limitation is absolute and L1 acquisition is not possible past the critical point. In its weak version, the term refers to the fact that the age limitation is not absolute, and that it is possible to acquire a foreign language at an adult age, but one cannot learn it to the extent of being able to pass for a native speaker.

It is important to remember that Lenneberg’s critical period hypothesis concerns specifically L1 acquisition; however, he did address himself to the issue of L2 acquisition, saying “A person can learn to communicate in a foreign language at the age of forty” ... “we may assume that the cerebral organization for language as such has taken place during ‘childhood’ and since natural languages tend to resemble one another in many fundamental aspects, the matrix for language skill is present” (1967, p. 176).

To account for L2 acquisition, Lenneberg has advanced two auxiliary theories: the resonance or automatic acquisition theory which states that first as well as second language acquisition before puberty is triggered by exposure to language and certain social settings. The individual who is maturationally ready reacts as a resonator to the environmental stimuli. The matrix theory states that L1 acquisition in interaction with innate mechanism creates a biological matrix which makes L2 acquisition possible. After puberty, the number of language learning blocks increases, automatic learning disappears, and the L2 can be learned only with a conscious and labored effort (*ibid*, p. 176). Andersen (1960) states that conditioning learning is equivalent to learning by the direct method, while conceptual learning is equivalent to the indirect one. Both types are age-linked, so that at age 10 conceptual learning outweighs conditioned learning.

As one surveys various studies on the relationship between age and L2 acquisition one cannot help feeling surprised at the inconsistency of research findings. While some studies show that younger acquirers are better at L2 acquisition than older acquirers (CARROLL, 1963), certain research reports refute this early sensitive period, showing older performers superior (WALBURG, *et al.*, 1978; MCLAUGHLIN, 1977).

Krashen *et al.* (1982), in their review of long-term studies, attempt to prove that the available literature on age and language is consistent with three generalizations: 1) adults proceed through early stages of syntactic and morphological development faster than children (where time and exposure are held constant); 2) older children acquire faster than younger children (the time variable and exposure are held constant); and 3) acquirers who begin natural exposure to second languages during childhood generally achieve higher L2 proficiency than those beginning as adults.

The short-term studies in which treatment and length of residency varies from 25 minutes (ASHER; PRICE, 1969) to one year (SNOW; HOEFNAGEL-HÖHLE, 1978a) have shown that adults are superior to children in rate of L2 acquisition and this is true both in natural and formal learning environments when the duration of the exposure remains constant though children surpass adults in about one year (SNOW; HOEFNAGEL-HÖHLE, 1978b).

In conclusion, we may quote Kagan (1971, p. 239) as saying, "Biology has prepared the child for a change in cognitive structure, motivation, affect or behavior, with experience playing the role of inducer. Exquisite, time-locked mechanisms alter the individual's psychic competence so that he is able to react to events in a new way."

3. Cognitive Factors

With evidence for subconscious acquisition of language by adults and the demonstration that lateralization does not set up a rigid obstacle to adults' L2 achievement, we need to look for another source of explanation for the observed child-adult differences in L2 learning, namely cognitive factors.

Some researchers have attempted to relate linguistic puberty to the onset of what Piaget has labeled "Formal Operations" (PIAGET, 1970). It has been suggested that at formal operation stage the formal thinker 1) thinks in terms of rules rather than ad hoc solutions to problems; 2) can arrive at abstract ideas without necessarily working through concrete objects, 3) can step back from his ideas and have "ideas about ideas" and is no longer totally dependent on "concrete-empirical props", 4) can have a meta awareness of his developing system of abstractness, 5) can organize his mental operations into higher, older operations, and 6) can conceptualize his own thought, take his mental constructions as objects and reason about them (ELKIND, 1970, p. 66).

The ability to think abstractly about language, to conceptualize linguistic generalization, or to construct a grammar may be dependent on those abilities that develop with formal operations. Piaget claims that cognitive development is at the very center of the human organism and that language is dependent upon and springs from cognitive development.

Some linguists in their attempts to account for the impact of formal operations on language acquisition argue that the adult's ability to mentally manipulate abstract linguistic categories gives him an advantage over the child in learning the L2 successfully. Genesee (1977, p. 148) observes that "The adolescent's more mature cognitive system, with its capacity to abstract, classify and generalize, may be better suited for the complex task of second language learning than the unconscious, automatic kind of learning, which is thought to be characteristic of young children." Halliday (1973) points out that the young child responds not so much to what language is as to what it does. According to Rosansky (1975), L2 development can take place in two different ways, namely automatically and formally. The young child sees only similarities, lacks flexible thinking, and is self-centered. Ellis (1986) maintains that the young does not know he is acquiring language; he has not developed social attitudes toward the use of one language as opposed to another and is cognitively open to another language. In contrast, the adult with the onset of formal operations, which appears at about age twelve is predisposed to recognize differences as well as

similarities, to think flexibly and to focus consciously on studying linguistic rules. The adult language learner has a strong meta awareness; he is likely to have social attitudes for or against the target language, and is more inclined to treat learning a foreign language as a problem to solve using his hypothetic-deductive logic.

Krashen (1982) argues that formal operations relate directly to conscious language learning which has a minor role in learning to speak a new language. The availability of conscious rules, however, permits very early production in the target language. The adult's knowledge of his L1 combined with his ability to learn the rules of the L2 consciously allows early participation in simple conversations. Krashen looks down onto this type of rule-centered language learning, saying "... Learners who acquire the new language system subconsciously will eventually surpass those who are dependent on conscious rules, despite the conscious learner's head start" (1982, p. 92).

The adult's conscious grammar of L2 plus his L1 learning experience, indeed, enables him to learn the L2 in a different way, more specifically, without acquired competence. According to Krashen (1982), it may happen that the adult needs to produce utterances very early in the new language before he has had a chance to acquire the needed structures via input. In so doing, he falls back on his knowledge of L1, using the conscious grammar of L2 as a monitor to make alterations in L1 structures in order to work out a conformity between the two linguistic systems for communicative purpose. Because of the quick results of this pseudo-learning, foreign language teachers are often tempted to resort to teaching the conscious grammar of the target language and demand early production on the part of the students.

Studies on cognitive differences between children and adults can explain some of the child-adult differences in L2 acquisition. Committed to the belief that there exists a relationship between formal operations and conscious learning, these studies predict a) the age at which the capacity for extensive meta-awareness develops, and b) adult initial advantage in the rate of learning. The cognitive argument, however, leaves unexplained why children outperform adults in L2 performance in the long run. To account for this, we now turn to considering psychological factors.

4. Psychological Factors

There is a consensus among researchers and teachers in accepting the affective hypothesis as the most contributing factor to child-adult differences in L2 acquisition. Schumann (1975) in a review paper argues why the investigation of instruction, age and aptitude has generally not been fruitful and that the affective variables may play a more important role than biological maturation in problems associated with L2 acquisition.

Larsen and Smalley (1972) suggest that "As puberty approaches and the individual is concerned with the consolidation of his personality, it apparently becomes more difficult for him to submit to the new norms which a second language requires". According to Schumann (1975), while the adults may find re-domestication

frustrating in terms of language shock and culture stress, the child, unconstrained by these disorientation effects, can naturally encounter the task of L2 acquisition. The adult L2 learner often feels dissatisfaction and even a sense of guilt at his inability to express himself through the target language; he is haunted by doubts as to whether his words accurately reflect his ideas; he may feel a sense of shame which results from feelings of insufficiency and his “narcissism is deeply hurt by the necessity of exposing a serious deficiency in a function” (STENGEL, 1939, p. 76). The child, however, is relatively free from such conflicts because in a communicative act he is concerned more with the language function than the language accuracy and feels rewarded when his message is picked up correctly by his playmate even if his words sound odd. He may even venture into learning new expressions in order to say what he wants to say.

An approach to L2 teaching devised by Curran (1972), called “Counseling-Learning”, seems to implicitly recognize the need for ego permeability achieved through reduced inhibitions. Curran, a clinical psychologist, who is interested in applying counseling skills to the teaching of foreign language, observes that many people attempting to learn an L2 experience anxiety and feel threatened. This emotional stress may be traced to the fact that “to learn a second language is, indeed, to take on a new identity” (GUIORA, *et al.*, 1972, p. 422). It seems the child’s permeability of language ego makes it possible for him to confront the task of learning a foreign language with little apprehension because he is endowed with empathic capacity or ego flexibility which the adult learner lacks. When the adult attempts to communicate in the new language his normal linguistic securities are undermined and he finds himself in a dependent state which he resists. On the contrary, the child, generally unfettered by such inhibitive factors and aided by his outgoing personality, will have, through verbal interactions, more exposure to, and intake from, the target language.

There is a plethora of studies pointing to the changes occurring in personality and attitude at around puberty but we will be focusing only on two psychological factors, field dependence/independence and motivation.

4.1 *Field Dependence-Independence*

The field dependence-independence to L2 acquisition variables, which are mutually exclusive, reveals some interesting findings, elucidating child-adult differences in L2 acquisition. To put it in other words, they are in complementary distributions. As Brown states (1987, p. 87), “Depending upon the context of learning, individual learners can vary their utilization of field independence or field dependence”. We find the following points illuminating the different phenomenon between the two groups of child and adult learners:

- 1) Children are predominantly field dependent and consequently may have a cognitive style advantage over the more field-independent adult learners (BROWN, 1987, p. 87). This distinction explains why adults use more

monitoring strategies, paying more attention to linguistic form for L2 learning while child acquirers have more disposition to acquire a L2 subconsciously (KRASHEN, 1977).

- 2) Adults are predominantly field independent and they perform better in deductive lessons while those with field dependent styles are more successful with inductive lesson designs (ABRAHAM, 1985).
- 3) Field independence is closely related to classroom learning that involves analysis, attention to details and mastering drills (BROWN, 1987). Field dependence will prove more facilitative in natural SLA (HANSEN; STANSFIELD, 1981). The reason behind this is that in naturalistic learning the greater social skills of the field-dependent learner will lead to more frequent contact with native speakers and so to more input (ELLIS, 1986, p. 11).
- 4) It has been found that field dependent people tend to show a “strong orientation”; they are usually more empathic and more perceptive of feelings of others; field independent persons, on the other hand, tend to show an “impersonal orientation”; they are generally individualistic and less aware of the things by which others are moved. We may posit the view that children, being affectively more empathic than adults and having more capacity for participation in another person’s feelings and ideas, stand a better chance than adults of having access to the target language, hence of acquiring it.
- 5) While the child L2 learner is generally function-minded, the adult L2 learner is basically concerned with language forms; children have the tendency to move from meaning to form in the process of language learning; adults, on the contrary, would like to traverse in the reverse direction. Proponents of communicative approach to L2 acquisition dismiss the methodology which requires manipulation of language structures in order to put them to use in discourse (as an adult L2 learner does in a classroom situation). Rather they are committed to the belief that “... One learns how to do conversation, one learns how to interact verbally, and out of this interaction syntactic structures are developed” (HATCH, 1978, p. 404). This characterizes child’s acquisition of L2 in naturalistic settings.

5. Motivation

A survey of literature on motivation shows that there is no general agreement about distinguishing features between attitudes and motivation (ELLIS, 1986, p. 117). Researchers in SLA such as Brown (1971), Gardiner and Lambert (1972), Schumann (1978), Dulay *et al.* (1982), have offered different definitions and used different terminologies while addressing themselves to the “attitudinal” and “emotional” factors related to L2 acquisition. Following Brown (1987), we use the term “attitude” to refer to a set of beliefs which the learner holds towards members of the target language group and his own culture, and the term “motivation” to refer to an inner device,

impulse or desire that stimulates the learner to take particular action (*ibid*, p. 114-117). Motivation can be global, situational, or task-oriented. Learning a foreign language requires some of all three levels of motivation. A learner, for example, may possess high global motivation but low motivation to perform a learning task, or he may have a high task motivation but be reluctant to do his best in a certain learning situation.

Amidst the countless studies and experiments on motivation Gardiner and Lambert's study (1972) is best known for its distinction made between integrative and instrumental types. Integrative motivation is defined as the desire to achieve proficiency in a new language in order to participate in the life of the community that speaks the language. It "reflects a sincere and personal interest in the people and culture represented by the other group" (GARDNER; LAMBERT, 1972, p. 132).

Instrumental motivation is defined as the desire to achieve proficiency in a new language for utilitarian reasons such as the practical value and advantages of learning a new language (GARDNER; LAMBERT, 1972, p. 132).

It is often said that integrated motivated students – those who wish to identify themselves with L2 speakers, or those with greater empathy capacity and more ego permeability, are in a better position to learn L2 than those who are instrumentally motivated as adult L2 learners often happen to be, although the two types of motivation are not necessarily mutually exclusive, i.e., most learning situations involve a mixture of each type of motivation, and that while some language contexts of foreign language learning involve identity crisis, there are learning contexts where L2 learners can easily integrate with the speakers of the new language.

SLA researchers, Krashen, Dulay and Burt, who have emphasized the attainment of communicative skills in the natural environment, suggest that "attitudinal factors, related to subconscious learning, are much better predictors of a student's eventual success in gaining command of a second language" (DULAY *et al.*, 1987, p.71). The integrative-instrumental distinction is related to child-adult differences in L2 acquisition in the sense that the child, endowed with a disposition to acquire L2 best subconsciously and with a lower affective filter, is integratively motivated, or more specifically, assimilatively motivated, and the adult L2 learner with mature cognitive abilities and meta awareness is instrumentally stimulated. To put it in other words, while the child is intrinsically motivated, the adult is generally extrinsically motivated. This will allow us to consider another set of factors related to the environmental domain. But first, we wish to endorse the discussion of the psychological factor with the following concluding remarks:

- 1) performers with "optimal" attitudes will obtain more input than performers with less than optimal attitudes. The former group will attempt to communicate more with the speakers of the target language and thereby obtain more of the input necessary for language acquisition (KRASHEN *et al.*, 1982, p.112).
- 2) Affective variables appear to relate strongly to acquisition and not to learning, especially when performers have been exposed to acquisition-rich environment (KRASHEN, 1980a).

- 3) Affective variables do not affect the actual functioning of Language Acquisition Device (LAD).
- 4) At around puberty, the affective filter is strengthened, hence keeping the input out. The fact that adults can acquire or do quite well in some ways quite similar to child language acquirers indicates that after puberty there occurs no change, destruction or degeneration in the LAD.
- 5) That the child is a better acquirer than the adult over the long run by no means implies that the adult beginner cannot obtain a very high level of proficiency. The result of the strengthening of the filter may only be that the acquirer is not able to reach the native speaker level. This position, however, does not exclude the possibility that certain adults with a low affective filter may in fact achieve native-like proficiency.
- 6) The filter hypothesis does not deny the possibility that children (especially older children) have no filters at all. The hypothesis implies that the filter does not necessarily weaken over the years; once strengthened, it may stay strong. Yet, according to Stevick (1976), a personality change or an affective positive situation could weaken the filter temporarily or permanently.

6. Environmental Factors

The language environment is said to encompass everything the language learner hears and sees in the language learning. “It may include a wide variety of situations – exchanges in restaurants and stores, conversations with friends, watching television, reading street signs and newspapers, as well as classroom activities” (DULAY *et al.*, 1982, p. 13).

Verbal events occur in a situation and each situational context requires its own proper language forms which will act as an input for the participants in a verbal interaction. Scarcella and Higa (1982), in an attempt to explain the relationship between input and age difference, focused on the native speaker’s input received by young and older L2 learners. They argued that simplified input did not necessarily lead to L2 development, rather it is the older learner’s ability to manage conversations that provide tools for obtaining input which is far better at attempting L2 acquisition than the simplified input received by younger learners; in addition, adult native English speakers do much more negotiation work in conversations with younger L2 learners than they do with older learners. They provide larger quantities of simple input, “a more supportive atmosphere and a constant check to see that the input the child receives is both attended to and understood” (SCARCELLA; HIGA, 1982, p. 193-194). We also assume that a learner’s verbal production is indeed a reflection of the nature of the input he is exposed to. We can repeat ourselves the other way round, saying the rich or impoverished input to which the L2 learner is exposed will reveal itself in one way or another in his linguistic output.

Children and adults have been seen to employ different conversational strategies. We should note that in order for the conversational participants to communicate, they must pay attention very closely to the ongoing discourse. Adult L2 learners are able to use strategies to get those parts of the input which they do not understand explained to them. Younger learners who do not employ these strategies to the same extent may receive more simplified input (SCARCELLA; HIGA, 1982, p.194). The older learner's active work in sustaining the talk results in his exposure to larger quantities of comprehensible "charged input" (STEVICK, 1976) which is closely followed by the learner. Scarcella and Higa's main point is that the simplified input which the child L2 learner receives is not as optimal as the input which the older learner receives through the work of negotiation.

Hatch, (1978) and Schwartz, (1980), while comparing conversations involving child L2 learners with those involving adult L2 learners, have shown that whereas child-adult sequences follow the "here-and-now", adult conversations are more likely rooted in displaced activities. As a result, the adult learner has difficulty in identifying the topic. Therefore, he requests clarification and echoes part of the native speaker's question in order to establish the field of reference. Hatch (1978) says that conversations typically commence by the child L2 learner calling the adult's attention. The native adult may respond by identifying the object and the child repeats the name of the object. Alternatively, the adult may ask the child to give some comment on the nominated topic. Ellis (1986, p. 139) affirms that this schematic representation of the adult-child conversation in L2 acquisition is very similar to the discourse pattern which has been observed in conversations between children and their mothers in L1 acquisition.

One further issue related to child-adult differences in L2 acquisition, we assume, is that of language choice, the selection of particular syntactic structures and lexical items in the process of conveying meaning. Language use involves choice; it is by choosing that the speaker renders his utterances ironical, metaphorical, or pragmatically rich. The choice of language form is determined by the actual situation in which a communication event takes place. The child L2 learner's choice of language forms, because of his limited life experience and world knowledge, is much narrower when compared with that of the adult L2 learner. The child, inexperienced in almost everyday matters and immature in conceptual thinking, easily manages with a limited amount of knowledge of target language when engaged in a communication. On the contrary, the adult, being reluctant to be constrained by the deficiency of L2 linguistic forms will venture into making new constructions (based on his L1 knowledge and conscious rules of L2) in order to say what he intends to say. After all, forms are the manifestations of language rules; functions, realizations of language uses, are related to speakers. Adults generally have more purposes, i.e., more functions of heuristic, imaginative, and representational types, to perform than children. Thus, we assume that the adult L2 learner's speech, because of the exigency of the conversational event, may happen to have features which may sound much stranger than the child L2 learner's speech while engaged in the same conversation event. Also, the child

L2 learner because of his young age appears to be in an inferior position, compared with the adult L2 learner, in terms of sensitivity of speech register, i.e., varieties of language used in friendly, casual, formal situations. The adult L2 learner due to his rich L1 experience has more register adaptability.

Concluding Remarks

In this paper, in an attempt to understand child-adult differences in L2 acquisition, we tried to consider four different factors: biological, cognitive, psychological and environmental, and under each heading we discussed the most relevant issues.

To put the finishing touches to the theme of this paper, we wish simply to go back to the opening quotation on the first page, namely, in order for the learners and teachers to “do it right”, they need to exploit best the assets Mother Nature has endorsed the human being with and then reflect over it in light of what we quoted from Kagan, “Biology has prepared the child for a change in cognitive structure, motivation, affect or behavior, with experience playing the role of inducer”. There is room for both analogy and analysis – conscious and subconscious – the cognitive code method and the natural approach in L2 methodology. It is the learner’s personality, his learning strategies, and needs that will serve as a guide for the teacher to set out the teaching activities both in classroom situations and natural learning settings. The teacher will have an easy task to perform if he is moving along the biological signals in cooperation with the innate mechanisms associated with L2 learning, or he will face an arduous task if he moves against the dictates that Mother Nature has ordained. To cultivate wild flowers in the man-made greenhouse will require great skills in terms of simulating the environmental effects which have nourished them. Unless we teachers learn how to “do it right” we need to work in tune with the biological time-locked mechanisms. After all, no particular case of learning could occur with equal facility at all stages of the life cycle. The problem of optimal learning, as was mentioned before, is the problem of the individual learner’s behavior.

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Acquisition of English articles by L1 speakers of [-article] languages

1. Introduction

Although articles are high frequency morphemes in English, it is observed anecdotally that L1 Malay and L1 Chinese speakers of L2 English still have persistent problems acquiring the system although articles are introduced early in the learning of English in Malaysian schools. The English article system is complex and previous L2 researchers have shown that ESL (English as a Second Language) learners often have difficulty with the use of articles but they have not been able to provide a conclusive explanation for this phenomenon. In contrast to the English language, Malay and Chinese are [-ART(ICLE)] languages, that is, they have no functional equivalent of the English article system, which comprises *the*, *a*, and $\emptyset$ (the zero article). These articles in English mark definiteness (*the*) and indefiniteness (*a*). In this case, the morpheme *a* includes both *a* and *an* as the indefinite article in English is realized as two allomorphs (*a* and *an*).

Although Malay lacks the equivalents of articles found in English, determiners are used in order to encode referent noun phrases (NPs). This is shown in the examples below, taken from Arshad (2005):

- (1) *Seorang budak muda berjalan kaki ke sekolah.*
CLS¹ boy young walk on foot to school
A young boy walked to school.
- (2) *Budak muda itu/tersebut sampai awal ke sekolah.*
boy young DET/DET² reach early to school
The young boy arrived early.
- (3) *Dia duduk dan menunggu kawan kawannya.*
3PS NOM³ sit and wait friends+3PP GEN⁴
He sat and waited for his friends.

¹ CLS – Classifier.

² DET – Determiner.

³ 3PS NOM – Third Person Singular Nominative.

⁴ 3PP GEN – Third Person Plural Genitive.

In (1), the classifier *seorang* which encodes the NP *budak muda* (young boy) in a new discourse context can more accurately be translated into a quantity, that is one person rather than the indefinite article *a*. In the same way, the determiners *itu* and *tersebut* (see for e.g. ARSHAD, 2005) in the known discourse context can best be equated to the English determiner *that* and *person* or *object concerned* respectively.

Not only does the Malay language differ from the English language by not encoding definiteness and indefiniteness through a function word like an article, there are also situations where there is no corresponding equivalent for English NPs encoded for indefiniteness. The following Malay examples taken from Arshad (2005) and the closest corresponding English translation illustrate this particular aspect related to indefinite NPs.

- (4) Budak itu ditemani kawan
 boy DET accompany+PASS⁵ friend
 The boy was accompanied by a friend
- (5) Budak itu ditemani seorang kawan
 boy DET accompany+PASS CLS friend
 The boy was accompanied by a friend
- (6) Budak itu ditemani dua orang kawan
 Boy DET accompany+PASS two CLS friend
 The boy was accompanied by two friends
- (7) Budak itu ditemani kawan kawan
 Boy DET accompany+PASS friends
 The boy was accompanied by friends

Unlike in the English language, indefiniteness in the Malay language can be expressed through the use of a zero morpheme as in (4) where the indefinite NP *kawan* (friend) is not preceded by any word. The corresponding translation into English, however, requires the indefinite article *a*.

The use of a classifier *seorang* in (5) and the numeral *dua* (two) in (6) indicate quantity. Thus they are not discourse devices to reflect first mention and indefiniteness which is the case when the indefinite article *a* is used in English. Example (5), however, is translated into an English sentence similar to (4). Indefiniteness of plural NPs such as *kawan-kawan* (friends) in (7), however, is encoded in a similar manner in English where the corresponding English sentence shows the use of a zero article.

The other language of interest in this study is Chinese, in particular Mandarin Chinese. Chinese has no equivalent to the English articles *the* and *a*. However, similar meanings are expressed by a combination of other mechanisms and reliance on context.

⁵ PASS – Passive.

Usually, the context makes it clear whether you are talking about a particular thing (definite), an example of a thing (indefinite), or various other possibilities.

In cases where it does not, there are expressions like *you yi-ge* (have/is one unit), *zhei ge* (this unit) and *nei ge* (that unit) that clarify the meaning. In other words, these notions are marked by determiners *zhei* ‘this’, *nei* ‘that’, and *yi* ‘one’ (<http://interstitiality.net/chineseDifferences.html>). However these are not mandatory components like the English determiners.

2. The Study

The aim of this study is to investigate the knowledge of English articles of L1 Malay and L1 Chinese speakers of L2 English. Specifically, the study set out to: (a) determine the accuracy of use of English articles in obligatory contexts, and (b) identify the contexts in which the articles are used erroneously by these learners. Based on these specific objectives, the following research questions were formulated for the study:

1. What do the values of SOC (number correctly Supplied in Obligatory Contexts), TLU (number of Target Like Use) and UOC (number Used in Obligatory Contexts) show about the acquisition of English articles by L1 Malay and L1 Chinese speakers of L2 English?
2. In what context(s) of article use do L1 Malay and L1 Chinese learners of L2 English have more difficulty?

3. Procedure

L1 Malay and L1 Chinese speakers of L2 English from two faculties in a Malaysian university participated in the study. The average age of these L2 learners was 22 years. All of them had had at least 13 years of tutored exposure to English as an L2. A standardized proficiency test (Oxford Placement Test) was used to select high intermediate and advanced L2 English speakers for the study. About 60 Malay and 55 Chinese students sat for this test which was administered a few days before the main instrument was administered. On the basis of the scores obtained for the standardized proficiency test, 28 Malay (3 male, 25 female) and 31 Chinese (7 male, 24 female) speakers were selected to participate in the study.

The study employed a blank-filling task and an elicitation task. The main instrument is the blank-filling task. Accompanying this task is a short section where learners supplied information on their background. Based on the information obtained from this section, it is found that all the L1 Malay speakers acquired Malay as their L1 while all the L1 Chinese speakers had acquired one of the many Chinese languages spoken in Malaysia as their L1. They also learned Mandarin Chinese in school at the age of six as they had all attended Chinese primary schools in Malaysia. The respondents attempted the task in one sitting.

Although all 28 Malay and 31 Chinese speakers attempted the main task, only 23 scripts from the Malay speakers and 28 scripts from the Chinese speakers could be analyzed as 5 Malay and 3 Chinese respondents did not answer some items in the task. These scripts were not included in the overall analysis.

The blank-filling task was a cloze, adapted from Master (1994), comprising 58 items in two parts. The first part comprised discrete sentences and the second, a descriptive paragraph. The participants were asked to fill in the blanks by writing the correct article on an answer sheet. According to Lu (2001), Master's test is a 'legitimate instrument' as it covers the whole range of article usage, including the four semantic categories of [$\pm$ Specific Referent ($\pm$ SR)] and [$\pm$ Assumed Known to the Hearer ($\pm$ HK)], and it was designed to test article usage for non-native speakers of English. The following are examples of the test items in Master 1994 (*apud* Lu, 2001, p. 46):

Table 1: Analyzed categories

Category	Article environment	Example	Item number
[-SR, +HK]	<i>the, a, $\varnothing$</i> Generics	The favorite food of <i>the</i> jaguar is <i>the</i> wild pig.	48, 49
		$\varnothing$ Wild pigs move in bands of fifteen to twenty.	50
[+SR, +HK]	the Unique, previously mentioned, or physically present referents	What is <i>the</i> diameter of <i>the</i> moon?	8, 9
		Once there were many trees here.	
		Now, <i>the</i> trees are gone.	10
		<i>The</i> air in this city is not very clean.	16
[+SR, -HK]	<i>a, $\varnothing$</i> First-mention NPs, or NPs following existential 'has/have' or 'there is/here are'	I would like <i>a</i> cup of coffee, please.	11
		I always drink $\varnothing$ water with my meals.	5
		There is <i>an</i> orange in that bowl.	1
[-SR, -HK]	<i>a, $\varnothing$</i> Equative NPs, or NPs in negation, or question	What is the sex of your baby? It's <i>a</i> boy!	4
		Einstein was <i>a</i> man of great intelligence.	17

The second instrument, an elicitation task, was modeled on that used by Ionin *et al.* (2003). Altogether 30 items were included in this task. This instrument was administered to elicit data to complement data obtained from the blank-filling task. The 30 items were based on examples provided by Ionin *et al.* (2003). The items were divided into the following types: (a) singular specific indefinites (b) singular non-specific indefinites

(c) plural indefinites and (d) definite DPs in previous-mention environments. The items are shown below:

Singular specific indefinites

3. At the park (Sing. Spec. Indef. – wide scope over an operator)
 Mother: What do you want to see here?
 Child: **I want to get a look at (a, an, the, ϕ) cat. I may see one behind the bush here.**

1. In a shopping complex (Sing. Spec. Indef. – use of *certain*)
 Salesgirl: I see you need help.
 Mother: **Yes, I am looking for (a, an, the, ϕ) certain girl of about 5. She is my daughter.**

9. At a university (Sing. Spec. Indef. – no scope interactions)
 Bill: Hi Rina – can you help me? I need to talk to Professor Chan, but I haven't been able to find her. Do you know if she is here this week?
 Rina: Well, I know she was here yesterday. **She met with (a, an, the, ϕ) student – he is in my Functional Grammar class.**

Singular non-specific indefinites

13. In a clothing store (Sing. Non-Spec. Indef. – narrow scp)
 Clerk: May I help you?
 Customer: Yes, please! I've rummaged through every stall, without any success. **I am looking for (a, an, the, ϕ) warm hat. It's getting rather cold outside.**

18. At a university (Sing. Non-Spec. Indef. – no scp interactions)
 Visitor: Excuse me – can you help me? I'm looking for Professor Ali.
 Secretary: I'm afraid he's not here right now.
 Visitor: Is he out today?
 Secretary: No, he was here this morning. **He met with (a, an, the, ϕ) student ... but I don't know where Professor Ali is right now.**

24. At a university (Sing. Non-Spec. Indef. – denial of speaker knowledge)
 Professor Ali: I'm looking for Professor Chan.
 Secretary: I'm afraid she is out right now.
 Professor Ali: Do you know if she is meeting somebody?
 Secretary: I am not sure. **This afternoon, she met with (a, an, the, ϕ) student – but I don't know which one.**

Plural indefinites

26. Phone conversation (Plural Indefs.– Plural Spec. Indef – wide scope)
 Jeweler: Hello, this is Habib Jewelry. What can I do for you, ma'am?
 Are you looking for a piece of jewelry? Or are you interested in selling?
 Client: Yes, selling is right. **I would like to sell you (some, the, ϕ) beautiful bracelets. They are very valuable.**
17. Phone conversation (Plural Indefs.– Plural Non-Spec. Indef – narrow scope)
 Salesperson: Hello, Jaya Jusco here. What can I do for you?
 Customer: Well, I have a rather exotic order.
 Salesperson: We may be able to help you.
 Customer: **I would like to buy (some, the, ϕ) green tomatoes. I'm making special Thai sauce.**

Definite DPs in previous-mention environments

7. Conversation (Definite DPs in previous-mention envs. – Singular Definite)
 Tom: My mother takes care of some old folks at the home. There are two old ladies and one old man. Last evening, my mum could not go as she was unwell, so I offered to help out.
 John: How did you help out?
 Tom: **I went to the home and wheeled (a, an, the, ϕ) old man out for a walk.**
8. Conversation (Definite DPs in previous-mention envs. – Plural Definite)
 Rina: My cousin started school yesterday. He took one notebook and two new books with him to school, and he was very excited. He was so proud of having his own school things! But he came home really sad.
 Vimala: What made him so sad? Did he lose any of his things?
 Rina: **Yes! He lost (some, the, ϕ) books.**

4. Results and Discussion

The results obtained from both instruments are discussed separately below.

4.1 The Blank-filling Task

In the study, SOC (Supplied in Obligatory Contexts) and TLU (Target Like Use) are used to measure article accuracy, following Lu (2001). The former was first devised by Brown (1973) and has been used in other studies (see for e.g. DULAY; BURT, 1973, 1974; BAILEY; MADDEN; KRASHEN, 1974). However, the SOC does not take into account over-suppliance of a morpheme in non-obligatory contexts. If the morpheme is over-supplied or overgeneralized, SOC will overestimate the learner's accuracy (Lu, 2001). As such, use of morphemes in non-obligatory contexts should be

taken into account in the accuracy measure. This would provide us with the morpheme over-generalization reading. Thus, the TLU was formulated by Pica (1983) in an effort to correct this problem. These two formulae measure article accuracy and are formulated as:

SOC = Supplied in Obligatory Contexts

$$\text{SOC} = \frac{\text{number of correct suppliance in obligatory contexts}}{\text{number of obligatory contexts}}$$

TLU = Target Like Use

$$\text{TLU} = \frac{\text{number of correct suppliance in obligatory contexts}}{\text{number of obligatory contexts} + \text{number of suppliance in non-obligatory contexts}}$$

In addition to the SOC and TLU measures, the UOC (Used in Obligatory Contexts) was formulated by Master (1987) to measure article use. The UOC is used as a complementary measure to observe the learners’ overuse or misuse of the article. It is formulated as:

$$\text{UOC} = \frac{\text{total number of suppliance in both obligatory and non-obligatory contexts}}{\text{number of obligatory contexts}}$$

Like the TLU measure, suppliance in non-obligatory contexts are also taken into consideration in UOC, to enable the inspection of the learner’s overall use of a certain morpheme. The UOC and SOC share the same denominator, so comparisons between accuracy and use can be easily spotted. Statistically, SOC and TLC cannot exceed 100%, but UOC can. So UOC is able to indicate overuse or under-use of the morpheme.

For ideal native-like use, SOC, TLC, UOC will all equal one. SOC indicates simple but potentially overestimated accuracy, TLU reveals a de-inflated estimate of accuracy level, and UOC shows learners’ actual use or overuse of the morpheme (Lu, 2001).

Table 2 summarizes the values of the SOC measure for the two groups of learners.

Table 2: Means of SOC (Supplied in Obligatory Contexts) for the Article Types

Ethnicity	N	SOC (Supplied in Obligatory Contexts)			
		the	a	φ	Average (the, a, φ)
Malay	23	533/713	233/299	166/322	932/1334
		74.75%	77.9%	51.55%	69.87%
Chinese	29	672/899	316/377	229/406	1217/1682
		74.75%	83.82%	65.00%	72.35%
Total	52	1205/1612	549/676	395/728	2149/3016
		74.75%	81.2%	54.26%	71.25%

The data indicate that the two groups have the same accuracy order for the SOC measure, that is, they are most accurate in their use of the indefinite article and

least accurate in their use of the zero article. However, the difference between the accuracy in *a* and *the* is more pronounced in the results for the L1 Chinese speakers while the accuracy in *the* and $\varnothing$ is greater for the L1 Malay speakers. The following is a summary of the results for accuracy order of the SOC measure:

Malay Speakers: $a > the > \varnothing$ (77.9% > 74.8% > 51.6%)
 Chinese Speakers: $a > the > \varnothing$ (83.8% > 74.8% > 65.0%)
 Average: $a > the > \varnothing$ (81.2% > 74.8% > 54.3%)

Table 3 presents the results for the TLU measure for the two groups of learners.

Table 3: Means of TLU (Target-Like Use) for the Article Types

Ethnicity	N	TLU (Target-Like Use)s			
		<i>the</i>	<i>a</i>	$\varnothing$	Average (<i>the</i> , <i>a</i> , $\varnothing$)
Malay	23	42.78%	51.10%	38.16%	43.61%
Chinese	29	42.78%	58.41%	40.25%	45.39%
Total	52	42.78%	55.10%	39.34%	44.60%

The results in table 2 reveal that the two groups again have the same accuracy order for the TLU measure. The order is the same as that obtained for the SOC measure, $a > the > \varnothing$. The difference between the SOC and the TLU is that the mean scores of the TLU are much lower than the mean scores of the SOC. This is to be expected as the number of suppliance in non-obligatory contexts is taken into consideration in the denominator of the formula for calculation of the TLU. Again the difference in means between the accuracy in *a* and *the* is greater in the results for the L1 Chinese speakers. The following is a summary of the results for accuracy order of the TLU measure.

Malay Speakers: $a > the > \varnothing$ (51.10% > 42.7% > 38.16%)
 Chinese Speakers: $a > the > \varnothing$ (58.41% > 42.7% > 40.25%)
 Average: $a > the > \varnothing$ (55.10% > 42.7% > 39.34%)

Table 4 presents the data obtained for the UOC (Used in Obligatory Contexts) measure for the two groups of learners.

Table 4: Means of UOC (Used in Obligatory Contexts) for the Article Types

Ethnicity	N	UOC (Used in Obligatory Contexts)			
		<i>the</i>	<i>a</i>	$\varnothing$	Average (<i>the</i> , <i>a</i> , $\varnothing$)
Malay	23	666/713 93.41%	389/299 130.10%	279/322 86.65%	1334/1334 100%
Chinese	29	810/899 90.10%	480/377 127.32%	392/406 96.55%	1682/1682 100%
Total	52	1476/1612 91.56%	869/676 128.55%	671/728 92.17%	3016/3016 100%

The UOC measure is important as it helps to interpret the acquisition processes underlying the orders in terms of article use for the two groups of learners. The data indicate that both groups of learners were moving towards being more native-like for the acquisition of *the*, although the L1 Malay speakers were slightly more native-like than the L1 Chinese speakers (93.4% versus 90.1%). The 2 groups of learners overused the article *a*, with the Chinese speakers being slightly better in their performance (127.3% versus 130.1%). Both groups underused the zero article $\varnothing$, with the Chinese speakers being more native-like than the Malay speakers (96.2% versus 86.7%). And the Chinese speakers tended to under use the definite article *the* more than the zero article $\varnothing$ (90.10% versus 96.55%) while the Malay speakers revealed the reverse pattern (93.41% versus 86.65%). Based on the results here, the learners on the average seemed to be more less native-like in their use of the indefinite article *a* as they tended to overuse it and by almost 30% for both groups.

The data obtained from the UOC measure show that the SOC and TLU measures are inadequate to measure accuracy in the use of the English articles among the non-native speakers. The UOC measure reveals a slightly different pattern. Thus, although the Malay and Chinese speakers seemed more accurate in their use of the indefinite article based on the SOC and TLU, they were in fact really overusing it. And although they seemed less accurate in their use of the definite article, they were actually under using it although the rate of under use was much smaller than their overuse of indefinite article. In fact, their under use of the zero article also reveal values that are smaller than their overuse of the indefinite article.

The results indicate that both groups of learners were moving towards being more native-like for the acquisition of *the*, although the Malay speakers were slightly more native-like (93.4% versus 90.1%). The two groups of learners overused the article *a*, with the Chinese speakers being slightly better in their performance (127.3% versus 130.1%). Both groups underused the zero article, with the Chinese speakers being more native-like (96.2% versus 86.7%). The Chinese speakers tended to under use the article *the* more than the zero article (90.10% versus 96.6%) while the Malay speakers revealed the reverse pattern (93.41% for *the* versus 86.7% for $\varnothing$). On the average, the learners seemed to be less native-like in their use of the indefinite article *a*.

4.2 The Elicitation Task

Table 5 presents the data obtained for article use in singular contexts.

Table 5: Article use in singular contexts

Category	Target	L1 Malay N=28	L1 Chinese N=31
		%	%
Definite	<i>the</i>	94.1	95.7
Specific indefinite	<i>a</i>	69.4	66.3
Non-specific indefinite	<i>a</i>	86.5	89.3

Data obtained from the second instrument for singular contexts (see table 4) indicate that both groups have difficulty with singular specific indefinite contexts (target *a* less than 70%) and more difficulty with singular non-specific indefinite contexts (less than 90%) than singular definite contexts (about 95%). It is not surprising that both groups of learners seemed to have least difficulty with the singular definite contexts as these involve definite DPs in previous-mention environments. In such instances, the learners were able to make use of the context (e.g. previous utterance) to select the appropriate article.

With regard to singular non-specific indefinites, three contexts are available: narrow scope, no scope interactions and denial of speaker knowledge (see examples 13, 18, 14). In each of the examples, the learner is able to fall back on the context (previous utterances to help out with the use of the indefinite article *a* or its allomorph *an*).

The difficulty encountered by the learners in the singular specific indefinite contexts (*a*) is particularly significant. L1 Malay and Chinese speakers (whose L1 languages are [-ART] languages, have an uphill task in dealing with *a*, *the* and the zero article in English. The notion of singular number normally entails the use of the indefinite article *a* (or its allomorph *an*). However, the added notion of specific to indefinite seems to confound the learners further. There are three contexts that are of relevance here: wide scope over an operator, use of certain, and no scope interactions (see examples 3, 1, and 9). In each of the examples, the context does not provide the kind of information that might help the learner to select the appropriate article with the possible exception of example 1 where the word *certain* might aid learners.

Table 6 shows the data for article use in plural contexts for the two groups of learners.

Table 6: Article use in plural contexts

Category	Target	L1 Malay N=28	L1 Chinese N=31
		%	%
Definite	<i>the</i>	84.5	79.6
Specific indefinite	<i>some / $\varnothing$</i>	72.6	90.3
Non-specific indefinite	<i>some / $\varnothing$</i>	70.2	77.4

In the plural contexts, the learners are less definite across groups. The contexts that are of relevance here are: definite DPs in previous-mention environments (see e.g. 8), specific indefinite wide scope (see e.g. 26), and non-specific indefinite narrow scope (see e.g. 17). The data from the plural contexts revealed that the Malay speakers are more accurate in plural definite contexts (84.5% vs 79.6%) while the Chinese speakers are more accurate with the plural specific indefinite (90.3% vs 72.6%) and the plural non-specific indefinite contexts (77.4% vs 70.2%).

As expected, the plural definite seemed less problematic generally. These involve previous mention environments and it is these contexts that helped learners to select

the appropriate article (definite *the*). However, it is unsure how L1 Chinese seemed to do much better in the specific indefinites compared to the L1 Malay learners. Perhaps they are more accurate as the items involve plural nouns and these signal that they should select either *some* or the zero article before the plural nouns instead of the definite article. Both groups are also less accurate in their acquisition of the non-specific indefinites. In such items, the context is usually not able to aid the learners to select the appropriate word to complete the sentence which probably explains why they are also less accurate in these environments too.

Overall, learners have most difficulty with singular specific indefinite contexts (*a*), followed by the plural contexts.

5. Conclusions

This study has examined the use of the article system among 2 groups of learners whose L1es are [-Art]. Its main finding is that the advanced learners may still have difficulty with these elements although they were taught the article system from the early stages of learning the language. The findings of the study have implications for the ESL classroom in terms of teaching methodology and development of material for the teaching of the English article system.

Studies have shown that L2 acquisition is largely a natural process of unconscious development, this development will have to take place with impoverished input (in comparison to L1 learners) (HAWKINS, 2005). In other words, teachers have to find ways to 'enhance the input learners get to maximize the triggering of unconscious development' (Hawkins, 2005, p. 17). According to him, this does not necessarily mean spending a lot of time teaching students about, or focusing on L2-L1 differences, but allowing them to use and interact with a wide range of structures in the L2, in this case, by including a lot of examples with article use. This will allow the innate ability of the learners to operate more freely when they acquire the language.

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Interlanguage development and L2 speech production: How do they relate?

1. Introduction

As DeKeyser (2005) suggests, one of the most important tasks of the cognitive sciences is to describe and explain the acquisition and use of a language, two processes essentially human that are under the influence of a number of complex variables. This task is made even more challenging when the language under investigation is a second or foreign language (L2), since after puberty the processes of acquisition and use of an L2 seem to be considerably different from those of an L1. In trying to gain a better understanding of interlanguage development, researchers have investigated issues related to age, aptitude, attention, memory as well as different aspects of cognitive processing. One of the outcomes of these studies has been the proposal of models of L2 acquisition. In most of these models, speech production is taken as the product of acquisition and is assumed to play no major role in the development of interlanguage. This assumption has long been challenged, however, by Swain (1985), who suggested that speech production may trigger acquisition processes by forcing learners to operate in a syntactic mode rather than the semantic mode generally required by comprehension processes. The role of production in interlanguage development, nevertheless, remains unclear. In this paper I address the relationship between production processes and language development by presenting a selective review of psycholinguistic models of speech production as well as the results of recent theoretical and empirical studies addressing the issue.

Over the last decade, the field of SLA¹ has witnessed a growing and much needed interest in the study of L2 speech production. Once seen as a neglected area, L2 speech production now stands as one of the major lines of inquiry in the investigation of L2 processes and skills and this certainly comes as a result of the centrality of speaking in the acquisition and development of languages both in naturalistic and instructional settings. As stated elsewhere (e.g., FORTKAMP, 2000), part of the reason why researchers have approached L2 speech production with caution has to do with the unfriendly nature of the skill: its complexity requires a high degree of experimental control – so much so that it can render the study too artificial to inform acquisition.

¹ In this paper, I will follow Ortega (2009) and “will use the acronym SLA to refer to the field and discipline” (p. 5). In addition, despite being fully aware of the differential effects that learning contexts might have on acquisition, I will use the term L2 to refer to additional languages. Finally, I will use the terms acquisition and learning interchangeably.

The task a researcher interested in speaking has to face is huge and includes taking decisions such as the most effective way to elicit speech that will provide evidence of what is being investigated and the best way to preserve the characteristics of speech production in the transcription of data. Perhaps because the field of SLA has advanced in the development of methodologies and because access to technology is now much easier than a decade ago, L. speech production is now a less opaque skill and is regarded as an important variable in L2 acquisition – one that can indeed trigger acquisition processes. It is now possible to find, in addition to the hundreds of studies carried out in several countries, entire collections devoted to L2 speaking (KORMOS, 2006) and even models of L2 acquisition that assign the skill a central role (GASS; MACKEY, 2007).

The idea that speaking could function as a potential variable in triggering L2 acquisition processes – and, therefore, be much more than simply the *result* of acquisition, as Krashen (1985) would have it – was first formulated by Swain (1985) in “The Output Hypothesis”. The history of this proposal is well documented in the literature (see, for instance, SWAIN, 2005) and the reader will remember that Swain was motivated by the evidence, in immersion programs in the Canadian context, concerning learners’ language proficiency. The debate on the differential effects of production on L2 acquisition is, however, far from being resolved – to this day, it seems that the SLA field still lacks convincing evidence that speaking can bring about acquisition (creation and consolidation of mental representations of the L2) and the tendency is to maintain the principle that comprehension is the driving force of development. In this paper, I address this debate by first briefly reviewing psycholinguistic models of speech production proposed in the context of the symbolic paradigm (see MOTA; ZIMMER, 2005) and then reviewing representative studies that attempt to disentangle the roles of production and comprehension processes in L2 acquisition.

2. The psycholinguistics of speech production: first and second languages

Odlin (2008) remarks that there are more similarities than differences between L1 and L2 speech production. It is perhaps for this reason that Levelt’s (1989, 1992, 1993) model of speaking has been used as the point of departure for models of L2 speech. Indeed the most comprehensive proposal, the model is grounded in the idea that the speaker is an information processor (p.1) and, therefore, it is from this perspective that speech processes are described.

The core idea in Levelt (1989, 1992, 1993) is that, to speak, we go through a number of processes that can be encapsulated in the traditional assumption of planning and execution. First, we apply conceptual processes which include making an initial choice of purpose or conceiving an intention to speak. Conceptual processes, Levelt argues, depend on the speaker’s state of motivation, the amount of knowledge shared with the interlocutor, and the discourse being created by the speaker and other

participants in a given context. In addition to the conceptual processes, there are specifically linguistic processes necessary to convey a message. With the concepts to be expressed in mind, the speaker has to access words that map onto these concepts, retrieve syntactic forms that correspond to these words, and build a grammatical structure. The grammatical structure has to be given a phonetic plan that will, in turn, activate the processes of the articulation system and finally be executed in terms of words, phrases, and sentences.

The processes involved in the conception of the message and in its development into a phonetic plan are assumed to constitute a general planning stage. The delivery of the message in actual sounds, as overt speech, is the general execution stage. Importantly, planning and execution processes do not take place in a linear manner. Levelt (1989) argues that most sub-processes of planning and execution occur in parallel and execution may begin at any moment of the planning stage. Our cognitive system allows for planning and execution to be carried out concurrently.

Levelt (1989) distinguishes four major components in his model of speech production – a conceptualizer, a formulator, an articulator, and a speech-comprehension system – each of these being autonomous and responsible for specific processes. Autonomy is a fundamental notion in the functioning of the model: Levelt predicts no information sharing between the components and each work as if ‘unaware’ of what is taking place in the other components at a given moment during speech production. In order to produce fluent L1 speech, the components work in parallel. This is possible because each component contains a number of procedures, which are part of the speaker’s procedural, implicit, knowledge.

These procedures act on the speaker’s declarative knowledge, which is stored in his/her long-term memory as factual knowledge. It is in the one, who conceptualizes that message generation takes place and this involves selecting and ordering relevant information in terms of concepts through macroplanning and microplanning. Macroplanning consists of planning the content of the message by the elaboration of communicative goals and the retrieval of the information necessary to realize these goals. Microplanning, on the other hand, consists of planning the form of the message and involves making decisions about the appropriate speech act – for instance, a question, an assertion, a suggestion – determining what is “given” and what is “new”, and assigning topic and focus. Again, here, Levelt assumes that it is not necessary to finish macroplanning for microplanning to begin.

The output of microplanning, and thus of the one, who conceptualizes, is the preverbal message, which is also the input for the next component, the formulator, where the preverbal message is developed into a phonetic plan through the selection of the appropriate lexical units and the application of grammatical and phonological rules. The translation of the preverbal message into a linguistic structure takes place in two stages – grammatical encoding and phonological encoding – and for that, the formulator first has to access the mental lexicon, where lexical units containing

information about meanings as well as syntactic, morphological, and phonological specifications, are stored in the form of declarative knowledge.

The lexical units of the mental lexicon consist of two parts: the lemma and the lexeme: the lemma is that part of the lexical unit that carries semantic and syntactic information, whereas the lexeme is the part that carries morphological and phonological information. Grammatical encoding consists of accessing lemmas and of building syntactic constructions such as noun phrases or verb phrases, all of which takes place by means of procedural knowledge. Thus, the concepts of the preverbal message trigger the appropriate lexical units in the formulator which, in turn, trigger the syntactic information about these units, which trigger the syntactic procedures necessary to build a surface structure of the message. The mental lexicon, thus, is central to this model.

The surface structure is the output of grammatical encoding and the input for phonological encoding, which consists of building a phonetic plan for each lemma and for the utterance as a whole. The construction of this plan is carried out through the information contained in the lexeme: the information about the word's morphology and phonology. The output of the formulator, the phonetic plan or internal speech, is the input for the articulator, the next processing component. In the articulator, internal speech is converted into actual overt speech by means of the coordination of a set of muscles – the process is highly procedural. The product of the articulator is what Levelt calls overt speech. Finally, Levelt proposes that the speech-comprehension system is the component that allows the speaker to monitor both overt and internal speech – the product of the speech-comprehension system is parsed speech, consisting of phonological, morphological, syntactic, and semantic information. Monitoring may take place at all phases of the speech production process, and it allows the speaker to compare what was intended to what was linguistically planned.

Through this brief presentation we can see that Levelt's Speaking model contains a good degree of specificity and, therefore, good explanatory power. In addition, as De Bot (2000, p. 421) wisely points out, the Leveltian proposal is based on sound empirical data, gathered by means of experimental research and studies of speech errors. For this reason, almost two decades ago, De Bot (1992) took the initiative to adapt Levelt's (1989) model to L2 speech production. De Bot's (1992) was an important contribution to studies of L2 speaking and is, by far, the most popular proposal in the field for description of nonnative speech processes (but see KORMOS, 1996). A presentation of his adaptation follows next.

The first aspect De Bot (1992) deals with is related to the decision the speaker has to make as to which language to use. This, according to De Bot, takes place in the conceptualizer – since it is this component that deals with information about the participants and the situation in which speaking will take place – during the macroplanning stage of the preverbal message. In the next sub process, microplanning, the speaker would use language-specific information to trigger the appropriate lexical units in the formulator. De Bot proposes the formulator to be language-specific, thus

making the important suggestion that grammatical and phonological encoding of L1 and L2 require different procedures. In his account of L2 speech, De Bot argues that L2 speakers produce two speech plans concurrently. Following Green (1986), he hypothesizes that L2 speakers produce speech for the selected language – the one being used to speak at a given moment – and for the active language, which is not being used but is regularly used. It is, thus, simultaneous encoding of two languages that allows code switching to happen.

In order to explain how the mental lexicon of an L2 speaker is organized, De Bot (1992) follows the proposal made by Paradis in the 1980s. Based on neurolinguistic research, Paradis (1985) claims that bilinguals have one conceptual store and two distinct semantic stores that are differentially connected to the conceptual store. The lexical items representing these concepts are stored separately for each language. In his Subset Hypothesis, Paradis (1987) proposes that the conceptual store is language-independent and that L1 and L2 lexical items are organized in different subsets. Having separate lexical stores requires the application of different procedures to carry out grammatical and phonological encoding. De Bot suggests that, during L2 speech production, the L2 lexical subset gets more activated than the L1 subset. Finally, De Bot suggests one articulator for both languages: the articulator stores a large set of sounds and pitch patterns. By proposing a common component, De Bot is able to account for L1 phonological interference in the L2.

Despite the growth of research on L2 speech production, De Bot's 1992 model is one of the few attempts to give a complete explanation of the psycholinguistic processes of L2 speaking. In fact, in addressing his proposal again, De Bot's (2000), reiterates the view that Levelt's account of L1 speaking is suitable to address L2 speech, pointing out that "a single model to describe both types of speaker is to be preferred over two separate models for different types" (p. 421). The model, however, is not without criticism. Although it stands as a theoretical framework to address issues of lexicalization, grammatical encoding, code-switches, and phonological interference, it does emphasize the idea of two concurrent plans being carried out by the L2 speaker, each one incrementally, without a principled account of how the cognitive system of the speaker handles this demand.

3. The role of production in L2 acquisition

In her Output Hypothesis, Swain (1985, 1995, 2005) argues that producing language (either speaking or writing) is an integral part of the process of L2 acquisition. With the proposal that output has three clear functions in acquisition (a noticing/triggering function, a hypothesis-testing function, and a metalinguistic function), Swain expands her hypothesis to predict that, under certain conditions, production (in the case of this paper, speaking) will impact acquisition by giving learners the opportunity to recognize gaps in their interlanguage. This realization will motivate learners and cognitively prepare them to search for ways to minimize these gaps by, for instance,

looking for relevant input. All in all, learners are cognitively motivated to move from a semantic mode to a syntactic mode or to go through syntacticization and sensitization of language forms (Izumi, 2003, p.189). Various studies have addressed the role of production in acquisition from an information-processing perspective (IZUMI *et al.*, 1999; IZUMI, 2003; IZUMI; BIGELOW, 2000), a cognitive-interactionist perspective and a socio-cultural perspective (for a review, see SWAIN, 2005).

Within the information-processing perspective, one line of inquiry has been the investigation of the functions of output, especially the noticing function, since this speaks directly to the role of an important variable in L2 acquisition: attention². In this perspective, most studies have used writing tasks as a means of elicitation of production. In two representative studies focusing on the noticing function of output (Izumi *et al.*, 1999; Izumi; Bigelow, 2000), researchers were able to show that improvements in interlanguage as a result of production can indeed be found, but only with ample opportunity for production and with relevant input. These studies also show that, as already known in the psycholinguistic literature of L1 speaking, L2 output is sensitive to task effects.

Izumi (2003), along the lines of De Bot (1996), outlines well the psycholinguistic rationale for the Output Hypothesis, this time concentrating on speech production. By establishing relationships between the Output Hypothesis and Levelt's Speaking model, he proposes a framework consisting of Output 1 and Output 2 and argues that the processes that take place in between are an important part of SLA (p.187). In his account, output would trigger processes such as grammatical encoding and monitoring which, in turn, lead the learner to look for solutions in the environment – and this engages processes of selective attention to input – or to stretch their internal resources. In this view, output is a powerful variable in the acquisition process because it promotes interaction between learners' internal (cognitive) factors and environmental factors, such as linguistic input and pedagogical intervention. Izumi (2003) also contends that, through metalinguistic reflection, output serves as a tool to prompt interaction within learners themselves.

Izumi (2003) warns us, however, that not all output will trigger the psycholinguistic mechanisms conducive to learning and, for this reason, it is necessary to engage learners in pushed output. Loose conversational contexts, for instance, are not likely to force learners' attention to form. Likewise, different task demands will draw learners' attention to different aspects of performance and influence the allocation of attention resources to form. Finally, level of proficiency is another variable that has to be considered in the proposal that output will lead to interlanguage development. Beginners, for instance, will most likely devote their cognitive resources to the search and retrieval of words and their accompanying grammar, with little left that will allow them to pay attention to form in their own output or in the input around them.

² At this point, it is important to emphasize that Swain (2000) has re-conceptualized the Output Hypothesis in the framework of socio-cultural theory and, from this perspective, she emphasizes that production – written but mainly oral – is a cognitive tool that serves the function of mediating our thinking.

Izumi (2003) emphasizes that for output to engage the psycholinguistic mechanisms of speaking, as specified in Levelt, the learner has to be involved in meaningful language use, a view that gained further support in Izumi and Izumi (2004). In the 2004 study, Izumi and Izumi tested 24 adult ESL learners, randomly assigned to one of three groups: an output group, a non-output group, and a placebo group. For the output group, the task consisted of a picture-description involving input comprehension and output (oral) production of relative clauses. The non-output group performed a sequencing-picture task in which input comprehension, only, was involved. Pre- and post-tests consisted of two-parts each. In part 1, participants were required to perform a sentence combination test and, in part 2, a picture-cued sentence interpretation test. Participants were also given a computer-assisted retrospective questionnaire aimed at assessing their attentional focus during treatment.

The results of the study show that the participants of the output group did not outperform those in the non-output group in learning relative clauses – either in the sentence combination task or the sentence-interpretation task – contrary to the predictions of the Output Hypothesis. The non-output group actually showed greater learning gains. In a post-hoc analysis of the treatment tasks, Izumi and Izumi found that the output tasks did not engage learners in the type of syntactic processing that is needed to trigger acquisitional processes. Instead, in the output tasks participants were able to produce sentences without comprehending their meanings, thus performing the tasks as mechanical drills.

4. Final remarks

To date, Izumi (2003) and Izumi and Izumi (2004) are one of the best accounts of the relationship between speech production and interlanguage development (but see Weissheimer, 2007). Their studies suggest a rich research agenda that, if addressed, should inform L2 speech production, especially with respect to classroom issues. In trying to answer the question posed in the title of the present paper, one could say that interlanguage development and L2 speech production are related to each other to the extent that the cognitive demands of the oral tasks learners engage in fire the psycholinguistic mechanisms of syntacticization, attention to form, and attention to form, meaning *and* use – best represented, in Leveltian terms, by grammatical encoding and monitoring.

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Interlanguage development and the acquisition of verbal aspect in L2

1. Introduction

Several studies have indicated that lexical aspect and grammatical aspect features interact in language. In particular, sentences in the Simple Past tense in English are normally employed by speakers to describe finished, completed events. When the Simple Past is associated with stative verbs, however, the situations described seem not to have strict boundaries and an open interpretation is sometimes preferred (MONTRUL; SLABAKOVA, 2002; SMITH, 1991, 1997). In Brazilian Portuguese, on the other hand, sentences in the Pretérito Perfeito – verb tense normally taken as the best equivalent to the English Simple Past – are always interpreted as referring to a finished, terminated event, even when associated with stative verbs (FINGER, 2000). Within this context, the present article aims at analyzing the extent to which Brazilian learners of L2 English, of distinct proficiency levels, are capable of detecting the semantic entailments related to the interaction between lexical and grammatical aspectual features present in the English Simple Past Tense.

The present article is organized as follows. First, a theoretical discussion regarding the way temporality is represented in language is made. In this section, an analysis of the distinction between tense and aspect and of the two different kinds of verbal aspect found in natural languages is presented. The way lexical aspect and grammatical aspect interact in English and in Portuguese is discussed in Section 2. In Section 3, the objectives and hypotheses that have guided the investigation are discussed. Details regarding participants and the task used are also introduced in this section. After that, the results are described and discussed. Finally, final considerations are drawn.

2. Representing temporality in language

Both *tense* and *aspect* are notions that refer to the temporality of events, but from different perspectives. *Tense* is the grammatical category that relates the time of a given situation to some other time, a reference time, usually the time of speech. It locates events in a time line with respect to a deictic center: the situations described by the speaker may be anterior (past), simultaneous (present) or posterior to (future) a reference time. *Aspect*, on the other hand, is a non-deictic category that refers to

a way of looking at the internal time of a situation. It marks the duration of a given event and/or its phases (cf. COMRIE, 1976; DOWTY, 1979; SMITH, 1983, 1991, 1997). For instance, the difference between sentences (1a) and (1b) is that of tense, whereas (2a) and (2b) show a difference in aspect.

- (1) a. Peter *is sleeping*.
b. Peter *was sleeping*.
- (2) a. Peter *slept*.
b. Peter *was sleeping*.

In the first group, *is* and *was* are used to contrast the difference between the two events in relation to a deictic center: present (or non-past) and past. By contrast, the difference between the sentences in (2) has to do with the way the speaker views the internal structure of the event: in (2a) he/she refers to a situation viewed as a complete event, whereas in (2b) he/she views the situation as consisting of internal phases.

There are two types of aspect: *inherent lexical aspect* and *grammatical aspect*. The two are independent but interact in a language. *Inherent lexical aspect*, also called *situation type* by Smith (1983), and *semantic aspect* by Comrie (1976) refers to the inherent aspectual properties of verb stems and other lexical items employed by the speakers to describe a given situation¹. It is seen as independent of time reference and any morphological marking. For instance, *walk* and *swim* are inherently durative, whereas *believe* and *understand* are inherently stative.

On the other hand, *grammatical aspect*, also called *viewpoint aspect* in Smith (1983, 1991, 1997) involves semantic distinctions which are encoded through the use of explicit linguistic devices, such as verbal auxiliaries and inflectional morphemes. The perfective/ non-perfective distinction in Portuguese and the progressive/ non-progressive distinction in English are examples of grammatical aspect. By selecting one or the other, the speaker shows whether he is considering an event as complete or as an ongoing situation respectively.

2.1 *Inherent lexical aspect*

Based on the analysis of the aspectual phenomena in English, Vendler (1957) proposed four semantic categories: states, activities, accomplishments and achievements, presented in Table 1 below². Vendler's (1957) fourfold schema – which took contributions from Ryle (1947) and Kenny (1963) – is the most widely accepted nowadays.

¹ In this paper, I will follow Ortega (2009) and “will use the acronym SLA to refer to the field and discipline” (p. 5). In addition, despite being fully aware of the differential effects that learning contexts might have on acquisition, I will use the term L2 to refer to additional languages. Finally, I will use the terms *acquisition* and *learning* interchangeably.

² At this point, it is important to emphasize that Swain (2000) has re-conceptualized the Output Hypothesis in the framework of socio-cultural theory and, from this perspective, she emphasizes that production – written but mainly oral – is a cognitive tool that serves the function of mediating our thinking.

Table 1: Aspectual classes of verbs (1957, p. 150)

States	activities	accomplishments	achievements
Have	walk	make a cake	find
Desire	run	play chess	stop
Love	study	draw a picture	open
Believe	pull something	read a book	lose
Know	play	run a marathon	bring
Want	swim	build a house	start

According to Vendler (1957), *states* describe events that cannot be classified as actions, in the sense that they do not have internal dynamics. They have indefinite duration and no clear endpoint. The use of a stative verb in a sentence implies that no change has occurred for the state to obtain. As Smith (1991, 1997) puts it, some kind of an external agent is necessary for a change into or out of a state to take place (e.g. *own a car*, *believe in God*, *be bald*). In addition to all qualities (*be married*, *be healthy* or *ill*, *be hard* or *hot*) and the “so-called ‘immanent operations’ of traditional philosophy” (VENDLER, 1957, p. 150) such as *desire*, *know* and *love*, the class of stative predicates also includes habits (occupations, abilities). That explains why a person can say that she teaches Chemistry at a public school even while jogging in the park. It is also commonly assumed that stative verbs do not normally occur in progressive tenses in English. For instance, ‘Bill *is learning* French’ (an activity sentence) is assumed to be a proper English sentence, whereas ‘Bill *is knowing* French’ is considered ungrammatical in standard speech. Comrie (1976) argues that “there are many verbs that are treated sometimes as stative, sometimes as non-stative, depending on the particular meaning they have in the given sentence” (1976, p. 36). He presents the sentence under (3) below as an example of a non-stative use of a stative verb in English:

- (3) *I’m understanding more about quantum mechanics as each day goes by.*

Comrie argues that, in spite of being normally used as a stative verb, *understand* in this case refers to “a change in the degree of understanding”, i.e. “a developing process, whose individual phases are essentially different from one another” (1976, p. 36-37).

Activity predicates, on the other hand, describe processes that involve some kind of mental or physical activity. Events such as *walk in the park*, *swim*, *read the paper*, and *ride a bike* occur over indefinite periods of time. Unlike stative events, they are dynamic and require some kind of energy input in order to keep going. Activities are also viewed as events that take time; that is, they last for a while. There is no arbitrary definition of the minimum amount of time an activity event is supposed to last. Intuitively, however, we do not say ‘John *is swimming*’ or even ‘John *swam* yesterday’ if he “swims” (or better, moves his arms!) for, let us say, five seconds.

Typically, activities are atelic events; i.e. they have no notion of completion, but an arbitrary final point. Smith (1991, 1997) refers to this class of verbs as having "...no goal, culmination or natural final point: their termination is merely the cessation of activity. (...) Activities *terminate* or *stop*, but they do not *finish*" (1997, p. 23).

Finally, the distinction between *accomplishments* and *achievements* was first noted by Vendler (1957).

When I say that it took me an hour to write a letter (which is an accomplishment), I imply that the writing of that letter went on during that hour. This is not the case with achievements. Even if one says that it took him three hours to reach the summit, one does not mean that the 'reaching' of the summit went on during those hours. Obviously it took three hours of climbing to reach the top. Put in another way: if I write a letter in an hour, then I can say, "I am writing a letter" at any time during that hour; but if it takes three hours to reach the top, I cannot say, "I am reaching the top" at any moment of that period. (pp. 147-148)

Vendler's words direct us to see that there is an important difference between these two types of verbs. While accomplishments have intrinsic duration and are processes composed of successive stages, achievements are instantaneous events. In addition to that, it is a property of accomplishments that we can say 'X V-ed' referring to a complete time frame, and not to a single moment within that time frame, which is true for achievements. Thus we say 'Harry *built* a bridge' referring to the whole event, whereas 'Harry *won* the race' refers to the culmination point of the racing event.

Vendler (1957, p. 145) also introduced the accomplishment category in order to draw a distinction between situations which are unbounded – activities (example (4a)) and situations which present an event as completed, with a natural final point – accomplishments (example (4b)). According to this distinction, when uttering (4a), the speaker is not making any statement as to how long the action will take place; that is, the action has no pre-determined endpoint. In case the speaker utters (4b), however, he/she is assuming that the event of walking will take place within a limited time frame and the sentence will be considered true only if John does not stop walking before the action of getting to school is reached.

- (4) a. John *is walking*.
- b. John *is walking* to school.

Moreover, if John stops walking at a certain point, it will still be true that John has walked, because he did, in fact, walk. The same reasoning cannot be applied to accomplishments, though. If John stops walking to school, he did not walk to school.

2.2 Grammatical aspect

According to Comrie, the notion of grammatical aspect is related to the "...different ways of viewing the internal temporal constituency of a situation" (1976, p. 3). It is usually expressed by a grammatical morpheme attached to the main verb

or to the auxiliary verb associated with the main verb in the sentence (the so-called ‘periphrases’). The main distinction between the various kinds of grammatical aspect refers to how much of a situation they make visible. Several classifications of grammatical aspect have been proposed in the literature, with Comrie’s proposal one of the most widely accepted. He classifies grammatical aspect into two broad categories: **perfective** and **imperfective**. He further divides imperfective aspect to include other kinds of aspectual distinctions that are sometimes present in the languages: habitual and progressive aspects. His classification is shown in Figure 1 below.

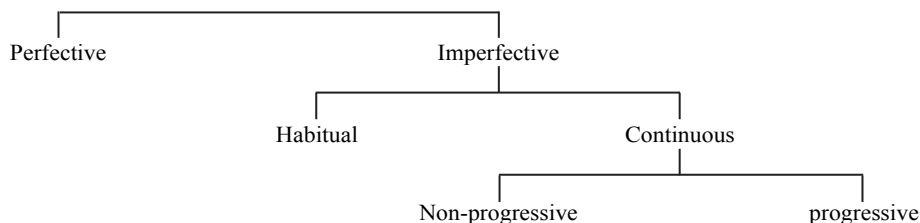


Figure 1: Comrie’s classification of aspectual oppositions (1976, p. 25)

According to Comrie, the types of aspectual distinctions present in different languages might vary. He further claims that sentences may have more than one aspectual interpretation and that the categories are independent. This framework accounts for the fact that the sentence ‘Fred *studied* here’, for instance, may be interpreted in a habitual reading (as in ‘Fred *used to study* here’) or from a perfective point-of-view (as in ‘Fred *studied* here from 1994 to 1996’). Comrie also assumes that English contains two aspectual oppositions: progressive (*be* + V-ing) X non-progressive (both associated with imperfective) along with perfective (*have* + Past Participle) X non-perfective.

Comrie’s idea that languages present different kinds of semantic distinctions is supported by an analysis of the Portuguese and Spanish Past tense. In these two languages, the Past tense can be expressed in two distinct ways, as the Portuguese sentences under (5a) and (5b) below will show. In addition to that, Portuguese (as well as Spanish) also has a separate progressive form, given under (5c). Example (5a) is in the ‘Pretérito Perfeito’, (5b) is in the ‘Pretérito Imperfeito’, and (5c) is a periphrasis formed by the auxiliary *estar* plus the gerund form of the main verb³.

³ It is worth noting that these sentences have different interpretations. While (3a) is normally used to denote a particular situation in which Pedro played soccer – somewhat similar to the use of the Simple Past tense in English, in (3b) the speaker implies that Pedro used to play soccer – a habitual situation – and no longer plays it. Sentence (3c) has a progressive interpretation.

- (5) a. Pedro *jogou* futebol.
 a 'Peter played^{Perf} soccer'
 b. Pedro *jogava* futebol.
 b 'Peter played^{Imperf} soccer'
 c. Pedro *estava jogando* futebol.
 c 'Peter was playing soccer'

Smith (1991, 1997) claims that the basic property of perfective aspect is to present a situation as a single, self-contained whole, therefore it is incompatible with any interpretation in which the internal phases of a particular event are taken into account. Perfectives are said to be *closed* informationally, that is, a perfective sentence normally presents both the initial and final points of a given situation. In addition, the use of the perfective aspect emphasizes the description of the termination/completion of a particular event as well. In the case of a telic event (4a), the perfective aspect will convey the existence of a natural final-point, whereas in the case of an atelic event (4b), it will convey the existence of an arbitrary final-point.

- (4) a. Jane *swam* in the lake.
 b. Kay *made* a cake.

On the other hand, imperfective sentences express the incompleteness of an action or state at a particular temporal point or reference. Because they present situations as incomplete or unfinished, they are said to be *open* informationally. In other words, they present parts of a situation, focusing on some internal stage of a situation and making no clear reference to its initial or final points. The imperfective aspect explicitly refers to the internal temporal structure of a situation.

It has been widely accepted that languages may vary with respect to the situations to which the imperfective aspect may be applied. The two most common imperfectives are the general imperfective and the progressive. In English, the imperfective is supposed to be used to denote activities and events (achievements and accomplishments) only. On the other hand, languages like Brazilian Portuguese allow imperfectives to be used to refer to stative situations as well⁴.

2.3 Interaction between lexical and grammatical aspect in English and in Portuguese

In English, most sentences written in the Simple Past (perfective aspect) denote finished, completed events (present both initial and final points). It is as if the situations were seen from the outside.

⁴ Smith (1991, 1997) argues that this variation is guided by the principles and parameters of Universal Grammar.

- | | |
|-------------------------------------|------------------|
| (5) a. John <i>ran</i> in the park. | (activity) |
| b. Kate <i>made</i> a cake. | (accomplishment) |
| c. Jim <i>opened</i> the door. | (achievement) |

Sentences containing state verbs, however, describe situations that do not possess clear time boundaries (SMITH, 1997; MONTRUL; SLABAKOVA, 2002):

- | | |
|--|-------------------------|
| (6) a. Elaine <i>knew</i> all the answers to the test. | (state) |
| b. ... but she has forgotten them all. | (closed interpretation) |
| c. ... and she still knows them. | (open interpretation) |

Because English does not have imperfective aspect, sentences containing activities, accomplishments and achievement verbs are said to be always interpreted as perfective when used in the *Simple Past*. It is worth noting that the main English tense to allow a perfective reading is the simple past. In BP, perfective interpretations are most common in the ‘pretérito perfeito simples’ (preterite), ‘pretérito perfeito composto’ (compound preterite), ‘futuro do presente simples’ (future), and ‘futuro do presente composto’ (future perfective).

Unlike English, the perfective aspect is available to all verb types in BP with a consistent closed interpretation. Even in stative sentences, the most natural reading is the one in which the situation is understood as closed, i.e., it does not continue into the present state. In all the examples that follow, the conjunctions with assertions that the situations continue in the present result in a contradictory statement (sentence (7d)).

- | | |
|--|---|
| (7) a. No verão passado, eles <i>viajaram</i> para a praia (? e talvez ainda estejam viajando) | ‘Last summer they traveled to the beach (and perhaps are still traveling)’ |
| b. Mês passado, João <i>escreveu</i> um livro (? e talvez ainda esteja escrevendo o livro) | ‘Last month John wrote a book (and perhaps he is still writing the same book)’ |
| c. Ana <i>abriu</i> as janelas da casa pela manhã (? e ainda está abrindo as mesmas janelas) | ‘Anna opened the windows of the house in the morning (and she is still opening them)’ |
| d. Maria <i>esteve</i> doente hoje de manhã (? e ela ainda está doente agora) | ‘Mary was sick this morning (and she is still sick now)’ |

Similarly to English, the perfective aspect presents activities as having an arbitrary final point (7a), accomplishments as having a natural final point (7b), and achievements are characterized as single-stage events (7c). Conversely, the final point of a stative situation is a change out of state (7d)⁵.

⁵ An interesting analysis of French introduced by Smith (1997) can be applied to the description of BP as well. In sentences like ‘Elaine *sabia* as respostas para o teste’ (‘Elaine knew all the answers to the test’), it may well be the case that she still knows them. In such a case, the claim is that the BP sentence provides no information regarding the continuation of the state: “the situation that may continue is the resulting state, not the change into that state” (p.195).

3. The study

3.1 *Objectives and hypotheses*

The study aimed at investigating the extent to which a group of Brazilian learners of L2 English was capable of recognizing the distinct semantic entailments – closed *versus* open interpretation – that result from sentences in the Simple Past containing stative verbs in comparison to the closed interpretation that results from sentences in the Simple Past containing eventive verbs (activities and achievements). A related goal was to analyze whether learners of L2 English demonstrate evidence of transfer of aspectual values from their L1 into the L2.

In order to investigate such goals, an experimental study involving Brazilian learners of L2 English of distinct proficiency levels was conducted. There was a total of three experimental groups (Groups A, B, and C), which will be described in 3.2 below. The individuals who volunteered to participate in the study were tested in a comprehension task, which will be described in 3.3 below.

The hypotheses that guided the investigation were the following:

- (a) The ability to detect the distinct semantic entailments improves with proficiency level in the L2, that is, beginners of L2 English would have more difficulty in detecting distinct semantic entailments than intermediate learners, which, in turn, would also have more difficulty than advanced learners. In order to verify this prediction, the scores of correct answers in the task should be compared and it was predicted that learners from Group A would achieve the lowest correct scores of correct responses, and Group C learners would achieve the highest scores in the task.
- (b) Verb type was predicted to influence responses. In other words, it was predicted that all learners would achieve higher correct scores in the sentences in the Simple Past containing activity and achievement verbs, in comparison with sentences containing stative verbs.
- (c) It was also predicted that learners, especially at the beginning level, would have more difficulty identifying the possibility of an open interpretation associated with stative verbs in the Simple Past, demonstrating transfer of aspectual values of L1 Portuguese into L2 English.

3.2 *Participants*

The corpus was composed of three experimental groups and one control group. The experimental groups were formed by 57 Brazilian learners of English, all students of English courses at a public University in Rio Grande do Sul (age range: 17 to 46; average age: 24). These participants were divided into three groups, according to their proficiency level in the L2⁶: Group A (beginners: 17 participants), Group

⁶ Due to time constraints, no independent proficiency measure was applied as part of data collection. It is important to note, however, that the students tested in this study had been previously classified into proficiency levels, when they entered the University course, after taking a proficiency test.

B (intermediate: 21 participants), and Group C (advanced: 19 participants). The control group was composed of 8 native English speakers from different nationalities (6 Americans, 1 Canadian, and 2 Australian).

3.3 Materials

In order to test participants' perception regarding the semantic entailments of English Simple Past Tense sentences, a *Sentence Judgement Task* was created. The task consisted of a series of dialogues, each containing a sentence in bold print. The participants were asked to attentively read each dialogue and decide, on the basis of their intuition, whether the sentence in bold print was acceptable or not in the given context. All dialogues contained only grammatical sentences in English. Some of them, however, were expected to be found strange or incoherent in their use of verbal tenses. Each test item (bold print sentence) was formed by two clauses, the first contained the verbal phrase to be analyzed (composed of state, activity, or accomplishment verb) whereas the second contained information revealing a closed or an open interpretation of what was presented in the previous clause.

The Sentence Judgement Task consisted of 48 dialogues, divided into two batteries of tests. Therefore, each participant analyzed 24 dialogues. A total of 12 verbs were used in the task: 4 states (*know, need, like, think*), 4 activities (*study, play, work, write*), and 4 accomplishments (*start, find, lose, break*). The participants were asked to follow their intuitions and check, in a scale from -2 to +2 (*Likert Scale*), the extent to which they believed the sentences sounded appropriate in the context given. It is important to note that the test contained one item with an open interpretation and one item with a closed interpretation for each verb.

Some examples of the test items are given below. The state verb *know* is associated with a closed interpretation in (8) and with an open interpretation in (9). In the case of (8), the speaker implies not to remember the names of the songs any more. In (9), on the other hand, the speaker implies that he still knows the subject. As the examples show, it is the context given in the second clause that seems to determine the preferred interpretation.

- (8) – I am looking for the *Blade Runner* CD.
 – I really love the original soundtrack.
 – I need a song for my graduation ceremony.
 – Oh! **I knew the names of those songs once but now I can't remember any...**
- (9) – We aced that Physics paper we handed in.
 – Don't tell me you're lying, please. I thought we were going to flunk.
 – Well, **I knew all the answers by heart! Ask me something and you will see!**

The following examples demonstrate the use of the activity verb *work*. In (10), the speaker locates the situation described in the dialogue (working as a waitress) in the past, which seems coherent with a closed interpretation of the event. In (11), however,

the participants were expected to consider the sentence in bold unacceptable, due the strangeness of an interpretation in which the boyfriend worked (finished event) and is still working at the store.

- (10) – How was your trip to Germany last year?
 – It was very nice and productive.
 – Did you take any language course?
 – No! **I worked as a waitress in a restaurant. I was able to practice my German there!**
- (11) – Do you normally watch *Friends* on TV?
 – I am a very big fan of sitcoms!
 – I want to rent one of their DVDs.
 – Oh! **My boyfriend worked in a video rental store and he's still working there.**

Before taking the test, the participants also filled out a consent form as well as a language background questionnaire.

4. Data analysis and discussion

In Table 2 below, the overall results in average and percent scores by proficiency levels are described. As the table shows, proficiency seems to have interfered with the amount of correct responses found in each group, as predicted in the first hypothesis put forward in the study.

Table 2: Overall mean results by proficiency level (total = 24 test items)

Group	Mean correct (percent)
Group A: beginners ($n=17$)	16.15 (67.21%)
Group B: intermediate ($n=21$)	17.3 (72.1%)
Group C: advanced ($n=19$)	19 (80.2%)
Control group: native speakers ($n=8$)	21.7 (90.5%)

When analyzed in more detail, the results also demonstrate some effect of verb type in the scores of correct answers, as shown in Table 3. Although statistical significance in the comparison was only found in Group B's answers in the ANOVA ($F(2,60)=8.10004$, $p=0.000769$), it is possible to observe that the percentage of correct results differ among verb types, more so in the beginning and intermediate proficiency levels (Groups A and B). It is also interesting to note that the sentences containing state verbs seemed to be more difficult to grasp for these learners, a fact that will be further analyzed below. The more advanced learners showed less difference between the correct responses among verb types, behaving very similarly to the speakers from the control group.

Table 3: Mean results by proficiency level considering verb types (total = 8 test items)

Group	Achievements	Activities	States
Group A (n=17)	5.6 (70.6%)	5.6 (69.9%)	4.88 (61%)
Group B (n=21)	6.52 (81.5%)	5.9 (73.2%)	4.95 (61.9%)
Group C (n=19)	6.42 (80.3%)	6.4 (79.6%)	6.47 (80.9%)
Control group (n=8)	7.4 (92.5%)	7.3 (91.2%)	7.03 (87.9%)

In the analysis of the results by verb type that took into consideration the responses given by the participants of each group regarding the possible semantic entailments of the test items – presented in Table 4 below –, it is possible to note that the correct scores were consistently higher in the closed interpretation for all participants, except for Groups A and B in the sentences containing state verbs. Such evidence can be taken to indicate that the hypothesis that predicted a preferred closed interpretation of the Simple Past when associated with achievement and activity verbs was confirmed.

Table 4: Mean results by proficiency level considering verb types and closed X open interpretation (total = 4 test items)

Group	Achievements		Activities		States	
	CLOSED	OPEN	CLOSED	OPEN	CLOSED	OPEN
Group A (n=17)	3.4 (85%)	2.2 (56%)	3.4 (84%)	2.2 (56%)	2 (50%)	2.88 (72.1%)
Group B (n=21)	3.6 (89%)	3 (74%)	3.1 (77%)	2.8 (69%)	2.33 (58.3%)	2.62 (65.5%)
Group C (n=19)	3.5 (88%)	2.9 (72%)	3.7 (92%)	2.7 (67%)	3 (75%)	3.47 (86.8%)
Control group (n=8)	3.7 (92%)	3.7 (92%)	3.8 (96%)	3.5 (88%)	3.33 (83.3%)	3.7 (92%)

It is also important to observe that a statistical significance was found in the analysis of correct responses associated with verb type in the closed interpretation for all three experimental groups: Group A ($F(2,48)=13.011, p<0.00001$); Group B ($F(2,60)=12.403, p<0.00001$); Group C ($F(2,54)=6.3181, p=0.0034$). No significant difference was found in the items implying an open interpretation of the Simple Past, however. This evidence is probably due to the lower scores of correct responses in the sentences containing stative verbs in the closed interpretation, which might indicate a higher degree of difficulty in the detection of the possibility of a closed interpretation of the Simple Past when associated with these verbs. This result can be taken to indicate some level of confusion demonstrated by the learners when analyzing aspectual values

of stative sentences in the English Simple Past. The hypothesis predicted that learners would probably have more difficulty detecting an open interpretation of stative verbs in the Simple Past, in comparison with other verbs, due to transfer of aspectual features of L1 Portuguese into L2 English. It is interesting to note, nevertheless, that this prediction was not confirmed, since the results indicate higher correct scores in the sentences containing stative verbs implying an open interpretation in comparison to a closed interpretation. Interestingly, the evidence indicates that the open interpretation was consistently easier to detect by learners than the closed one.

5. Final considerations

The study reported in this paper aimed at analyzing the extent to which a group of Brazilian learners of L2 English of three different proficiency levels was able to identify distinct semantic entailments related to the interaction between lexical and grammatical aspectual features present in the English Simple Past Tense. In particular, the study verified whether these learners could identify closed *versus* open interpretations that result from sentences in the Simple Past containing stative verbs in comparison to the closed interpretation that results from sentences in the Simple Past containing activities and achievements. In addition to that, it also investigated whether these learners showed evidence of transfer of aspectual values from their L1 into the L2.

In order to investigate the objectives presented above, an experimental study involving 57 Brazilian learners of L2 English of distinct proficiency levels was conducted. The corpus involved three experimental groups (Groups A, B, and C) and a control group (composed of 8 individuals) who volunteered to take a comprehension task (Sentence Judgement Task).

Irrespectively of the particular details, the evidence found shows that, overall, beginners had more difficulty analyzing the semantic interpretation of the sentences than the intermediate learners, who, in turn, achieved lower overall scores than the more advanced students. Such result confirms the prediction put forward in the study that the ability to detect distinct semantic entailments improves significantly with growing levels of proficiency in the L2.

Another prediction was related to the interaction between lexical and grammatical aspect features. The hypothesis predicted that all learners would achieve higher correct scores in the sentences in the Simple Past containing activity and achievement verbs, in comparison with sentences containing stative verbs. This hypothesis was also confirmed, as shown in Table 3, which demonstrates that the scores of correct answers were lower in the sentences containing stative verbs in comparison to the other sentences in the task.

In addition to that, it is interesting to note that learners of all proficiency levels consistently achieved higher correct scores in the sentences implying a closed interpretation with achievement and activity verbs, which can be taken to indicate that

these sentences were easier to understand in comparison to the ones containing stative verbs. This can be partially explained by the more natural association of the perfective aspect contained in Simple Past and the telicity feature present in achievement verbs. Activity verbs, however, are atelic and unbounded, which makes this particular result hard to explain.

Besides, learners were also expected to demonstrate more difficulty (thus achieving lower correct scores) in recognizing the open interpretation than the closed interpretation of state verbs used in association with Simple Past due to possible transfer of aspectual properties of L1 Portuguese into L2 English. Such prediction was not confirmed, since learners achieved higher correct scores in the sentences containing stative verbs implying an open interpretation instead of a closed interpretation.

Finally, it is important to emphasize the need for more studies dealing with the acquisition of semantic aspects of L2 verb morphology. Other kinds of data collection, such as, for instance, investigations involving the analysis of *corpora* databases may provide clearer examples of how such tense/ aspect subtleties are dealt with by proficient/native speakers of English. The results reported here point to the importance of conducting more empirical research focusing on distinctions related to tense / aspect morphology, given the degree of systematicity that seems to be present in the way second language knowledge grows.

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The role of implicit and explicit instruction in the acquisition of infinitives and gerunds in english by native speakers of portuguese

1. Introduction

The role of implicit and explicit instruction, issues such as the differences between implicit and explicit learning, as well as the relationship between these two kinds of knowledge has been a constant focus of research and discussion among researchers and teachers of ESL. Similarly, the contrast between the effects of different types of instruction is an endless source of information, not only for the understanding of the issues involved in learning a L2, but also for the improvement of classroom practice.

Moreover, the interface between implicit and explicit knowledge demands a discussion about the different degrees of interaction involving them. Thus, this work had its origin in the perception of two different positions: the first, held by the students (many demonstrate and emphasize a strong need for the presentation of rules in the instruction they are provided with, and show insecurity when it doesn't happen); the second, held by teachers (who face the complexity of these structures, or the need to follow the curriculum established by the institution they work for within a relatively short time).

Consequently, the present research aims at discussing the role of attention and awareness in the learning process, since these concepts are important pieces in the construction of different types of implicit and explicit knowledge acquisition. This research also intends to contribute (through its theoretical review and the analysis of data) to the expansion of studies in the area of Applied Linguistics, as well as to the teaching of English, so as to offer tools to better understand the factors involved in the complex and rich world of learning. The use of infinitives and gerunds in the English was adopted as the object of analysis, since much of the material available for teaching these structures does not seek an understanding of its use but a memorization of lists of verbs.

2. Theory

2.1 The distinction between implicit and explicit knowledge

The necessity and efficiency of providing learners with instruction (with or without the rules) has generated discussions and debates among SLA researchers and teachers, as the topic involves broader concepts, such as the definitions of learning and

attention to grammar forms in the input provided to students. In this context, Krashen developed the Monitor Theory (1981, 1982), which states that adult learners have two independent systems to develop skills in a second language: the subconscious acquisition and conscious learning. According to Krashen, these systems inter-relate and, although conscious learning works as a monitor, the subconscious acquisition seems to be more important in the process. Consequently, since fluency in production is a result of communicative practice, the formal knowledge (awareness) of the second language can only be used to modify and monitor what is being produced to achieve greater accuracy. In this model, the correction of errors and the instruction provided are not relevant to the acquisition: “the only contribution made by instruction is comprehensible input that may not be available outside the classroom” (KRASHEN, 1985, pp. 33-34).

In other words, acquisition is similar to the process used by children to acquire their first language (which requires significant interaction in the target language – natural communication – where the speakers are not concerned with the structure of their utterances, but with transmitting and understanding the message). Learning, in turn, would only be responsible for changes before or after the production of the speaker in the target language. These concepts are similar to what is now defined, respectively, as implicit knowledge and explicit knowledge, or episodic and declarative knowledge.

Hulstijn (2005, 2007) and Hulstijn and Ellis (2005) describe explicit knowledge as the knowledge of symbols (concepts, categories), and implicit as the knowledge underlying the normal and fluent speech, as well as the understanding and the writing of native speakers. The author differentiates between these two types of knowledge based on the existence – or not – of awareness regarding the regularities behind the acquired information, and on the possible (or not) verbalization of such regularities. Therefore, the automation of knowledge (through the practice, *per se*) results in a loss of awareness – by the speaker – of the mechanisms used during the linguistic production.

Similarly, Ellis (1994) attributed to the awareness a fundamental role in the distinction between the two types of knowledge. Implicit learning occurs automatically (when the learner shows no awareness of the mechanisms used in the linguistic production). On the other hand, explicit knowledge implies awareness by the learner, and includes situations in which he/ she consciously searches and tests linguistic hypotheses (using the knowledge of rules concerning the use of language obtained through the instruction about the forms of the L2). Since implicit knowledge is called procedural, it can only be verbalized by making it explicit. Its access is easy and quick, which, consequently, makes it available for use in fast and fluent communication. In most researchers' view, competence in L2 is primarily related to implicit knowledge.

Explicit knowledge, however, concerns the anomalous and declarative knowledge, sometimes, of phonological, lexical, grammatical, pragmatic and socio-

critical features of a L2 (ELLIS, 2004, p.244). This kind of knowledge can be learned and verbalized; is consciously stored and typically accessed when learners experience some kind of linguistic difficulty in the L2, during a controlled process.

2.2 Types of interaction between implicit and explicit knowledge

In an attempt to describe the level of interaction between implicit and explicit knowledge, several researchers have questioned the degree of autonomy and independence between them, so as to evaluate whether it is possible and/or to what extent the knowledge acquired explicitly may become implicit.

Three positions resulted from this discussion, and were subdivided into the non-interface hypothesis (according to which there is no interaction between the two types of knowledge); the Strong Interface Hypothesis (for which the explicit knowledge becomes implicit through practice) and the Weak Interface hypothesis (which assumes that explicit knowledge could work as a facilitator in the construction of implicit knowledge).

2.2.1 The Non-interface Hypothesis

According to Krashen (1985), the knowledge derived from explicit and implicit learning do not have any interaction (interface), and there is no communication between them. The loss of awareness of the knowledge never occurs, which means that what is learned consciously and explicitly and can only be used in a controlled manner and, therefore, not converted into implicit knowledge, which is used in an automatic way. Thus, according to the Input Hypothesis, the learner must be provided with comprehensible input (through reading or listening to the structures of the target language in communicative situations conducted in the classroom) in his/her level of competence, but which – at the same time – challenge him/ her to improve this competence (as defined by Krashen, the “ $i + 1$ ”). According to this hypothesis, the speaker would be able to induce the rules underlying the input without the need for conscious reinforcement.

However, other authors argue that there is no link between the acquired and the learned knowledge. Among these linguists, there is Paradis (1994, 2004), who differentiates the types of learning by comparing them to the linguistic competence and the metalinguistic knowledge. The author defines the first concept as competence acquired incidentally, used in an automated way (and, therefore, procedural way) and subsidized by the procedural memory. This competence would be implicitly stored, since the speakers are not aware of the ‘computational procedures’ that generate the sentences they produce. Metalinguistic knowledge, in turn, is learned in a conscious way (and, therefore, declarative way), explicitly stored, subsidized by the declarative memory and used in a controlled manner, with a set of grammar rules stored that may be applied consciously. For the author, the linguistic competence and the metalinguistic knowledge have different natures, and therefore it would not be possible for one to become another. Speakers can behave as if they had internalized a particular explicit

rule, but that only means that through practice, they internalize ‘computational procedures’ that enable them to produce (and to understand) sentences that can be described through a particular explicit rule. Generally, more than one explicit rule may correspond to a particular form, and there is no way to determine which, (if there was one) is the true representation of implicit memory used in an automated way. Grammar rules are, therefore, abstractions – not descriptions of real computational procedures (PARADIS, 2004, pp.33-34). Hence, in Paradis’ view, what happens – through repeated exposure and use of certain sentences – is the acquisition of “implicit computational procedures”, which eventually allow the automated production and comprehension of such sentences.

2.2.2 The Strong Interface Hypothesis

The advocates of a strong interface between explicit and implicit knowledge – such as Anderson (ANDERSON; LEBIERE, 1998) – believe that explicit knowledge becomes implicit knowledge through its proceduralization.

In this context, Hulstijn (2007) argues that although there are many ways to develop implicit knowledge (automation), the automated processing does not involve conscious control.

Dekeyser (1997) also defends the Strong Interface Hypothesis, and does not limit the discussion to the interaction between the two types of knowledge. For him, all kinds of learning derive from the acquisition of a type of declarative knowledge (the “knowing what”) from a behavior or ability in order to reach a certain procedural knowledge (the “how”). In this view, it is precisely this kind of procedural knowledge that is automated through practice and will be quickly and intuitively accessed.

Linguists who disagree with these arguments suggest that the central problem of this hypothesis is that it does not state whether the knowledge actually becomes implicit or if the processing is fast enough to keep this knowledge in focus for a period of time. Moreover, as pointed out by Hulstijn and de Graaff (p. 105 *apud* ALVES, 2004), the Strong Interface Hypothesis does not explain the fact that learners, even after being exposed to formal explicit instruction and to the practice of a specific linguistic rule, still produce the same mistakes they used to make before being submitted to the pedagogical work.

2.2.3 The Weak Interface Hypothesis

According to this hypothesis, explicit learning might promote the development of implicit knowledge, since it plays the role of a facilitator of intake by providing the ability to notice the details in the input. Among the proponents of the existence of a weak interface between explicit and implicit knowledge, Schmidt (1990, 1993, 1994, 1995) emphasizes – through his Noticing Hypothesis – the importance of noticing as a sufficient condition for the conversion of input into intake.

Like Schmidt, Ellis (1994, pp. 88-89) also defends the Weak Interface Hypothesis, asserting that explicit knowledge derived from formal instruction can

be converted into implicit knowledge, but only if the learner has reached a level of development that allows him/ her to accommodate the new linguistic material. In such cases, the pre-existing knowledge of the learner works as a filter that refines the explicit knowledge and selects only what the student is ready to incorporate into his/ her inter-language system. In other cases, however, when the focus of instruction is a grammatical property that is not limited by the development stage, the filter does not operate, allowing the learner to integrate the information to his implicit knowledge.

2.3 Implicit and explicit instructions

Hulstijn (2005) defines the explicit instruction as the type of instruction in which the students are provided with information about the rules underlying the input. Implicit instruction, in turn, occurs when this information is not provided. Dekeyser (1995) improved these definitions by affirming that an educational / instructive treatment is explicit if information about the rules are part of the instruction or when students are requested to pay attention to particular forms and to find out about the rules for themselves (induction). In contrast, when neither the presentation of the rule or the instructions to focus on particular forms is part of the treatment, it is considered implicit (NORRIS; ORTEGA, 2000).

Accordingly, it is important to notice that not only the presence (or absence) of information about the rules, but also the oriented search for information by the learners are distinctive factors between these two types of instruction. The criteria for such differentiation are further extended by Zimmer, Alves and Silveira (2006), for whom the notion of explicit instruction includes all the pedagogical procedures that aim at ensuring the use and the exposure of students to the linguistic forms at issue, in a communicative environment. For the authors, explicit instruction can be used for the development of linguistic awareness of any aspect of the L2 – phonological, morphological, syntactic, semantic and pragmatic – in a deductive or inductive way.

2.4 Implicit and explicit learning

According to several authors, such as Hulstijn (2005) and Dekeyser (2003), implicit learning concerns the processing of input without the intention of discovering whether the information provided contains regularities. It is the process that characterizes the acquisition of the first language. On the other hand, explicit learning concerns the processing of input with the conscious intention of discovering the existence of these regularities, and if so, the study of the concepts and rules that facilitate the learning of these rules.

Rhode and Plaut (1999 *apud* ZIMMER; ALVES; SILVEIRA, 2006) described learning by adult speakers as partially explicit or implicit, since the cognitive systems of adults is already structured in the L1, which does not explain the full processing of the properties of the L2 input. As to the traditional approach – where the teaching of rules seems to predominate – Dekeyser characterizes learning as being explicit and deductive. On the other hand, when students are encouraged to find rules for

themselves through the study of examples contained in a text, learning becomes explicit and inductive. And, yet, when children acquire linguistic competences in their native language without thinking about their structure, their learning is not only implicit but also inductive.

2.5 Attention and awareness

Schmidt (1995, p. 1) defines attention as a phenomenon that involves a variety of mechanisms, such as mental state of alertness, orientation, detection, registration, pre-consciousness (detection without awareness), selection (detection with awareness within the selective attention), facilitation and inhibition.

He also characterizes attention as being limited, selective (when resources are limited, a cost / benefit analysis determines the focus of attention), and subject to voluntary control (many studies on the practice of teaching a second language show that students notice different aspects of the target language, and that one of the essential objectives of instruction is to help learners to focus their attention). The author argues that attention controls access to awareness, and that – among the functions of the other mechanisms included in the concept of attention – Schmidt says that the inhibition of data processing allows the less important information to be processed without interference. For the author, the big issue in the study about the role of attention is not to determine whether there can be learning without this skill, but if greater attention results in better learning.

2.6 The role of awareness and perception in the learning of L2

The roles of the consciousness and attention processes involved in acquiring a second language were questioned at the time of Krashen's studies. Over the years, other authors tried to differentiate and/or to refine these concepts and to define the degree (s) in which they operate during the learning process. Consequently, these concepts ramify into more specific classifications, which, in turn, become new areas of questioning. For the author, awareness as attention would be sufficient and necessary for the conversion of input into intake, provided that only the linguistic aspects contained in the input were effectively noticed.

2.6.1 The Noticing Hypothesis

Schmidt also assigns consciousness two levels: a lower level (noticing) in which the learning process occurs consciously, and a higher level (of understanding), where the processes are more complex. The lowest level (noticing) would relate to the conscious record of an event", while the level of understanding would refer to the recognition of a general principle, rule or standard (p. 29). According to the author, at the highest level (understanding) the rules underlying the system of the target language would be processed and implicit and explicit learning would distinguish. The author also argues that attention and noticing (i.e., a conscious state by the learner) are two virtually isomorphic and indispensable concepts to all forms of learning.

These assumptions characterize the Noticing Hypothesis (SCHMIDT; FROTA, 1986; SCHMIDT, 1993, 1995), which states that only the linguistic aspects that are effectively noticed and understood from the input will be acquired (1995, p.20).

Schmidt explains that noticing involves specific linguistic structures of the input, so that, to acquire other aspects, the learner must be very attentive to these aspects of the language. Factors such as the salience of the aspect at issue, its frequency in the input, the requirements and objectives of the task and the level of proficiency of the learners (1990, p. 143) determine the amount of input that will be noticed by the learner. Although Schmidt claims that noticing is a pre-requisite for learning, the author does not deny the existence of incidental learning (non-intentional). For him, there is no doubt that incidental learning of language can occur and that noticing constitutes, in this case, a necessary condition (once explicit learning promotes the development of implicit knowledge through it, performing the role of intake facilitator).

3. The study

3.1 *The participants*

The study had students of a Federal University as participants. All of them attend(ed) the Languages course and intend to be teachers of English. All students answered a proficiency test before joining the English classes from their graduation course.

Out of the six groups that were selected for the study, two (one from a beginner level and one from an intermediate-advanced level of proficiency) were provided with explicit instruction; two groups (with the same levels of proficiency) were provided with implicit instruction, and the other two groups (also with the same proficiency levels) were not provided with any instruction, and constituted control groups.

3.2 *Testing*

The tests contained 12 verbs classified in three groups: “to – verb” (choose, decline, decide, agree), “verb – ing” (avoid, enjoy, suggest, finish) and “to – verb” or “v – ing” (forget, stop, remember and regret).

Therefore, two pre-tests and two post-tests were applied (containing understanding and interpretation exercises) to two groups of students with beginner level of proficiency (1A and 2B) and two groups of students with intermediate-advanced level of proficiency (1A and 2B). To the control groups, only the pre-test was applied. Both pre- and post-tests contained the same structure: 28 questions of interpretation and 28 questions of production. Out of that total, four questions were distracters. The interpretation questions contained sentences (in English) in which the verbs selected for the study were used. Participants should interpret the sentences and choose the alternative that best corresponded to the translation of the sentence. The alternative “d” (in all the questions) indicated that the student did not know the correct answer, as shown in Table 1.

Table 1: Comprehension test

<i>Choose the answer that best reflects the idea expressed in the sentence:</i>	
1)	Sue wanted to play chess.
()	a) Sue queria jogar damas.
()	b) Sue não queria jogar xadrez.
(X)	c) Sue queria jogar xadrez.
()	d) Não sei responder a questão

Similarly, the two versions of the production tests contained the same verbs used in the comprehension tests. In these tests, however, participants should fill in the gaps using the verbs indicated (in brackets) and the contextualization clues provided in each sentence. As in the interpretation tasks, the two versions of the production test contained four distracters, whose main verbs were not part of the group of verbs selected for this analysis. All the sentences of the production tests were contextualized by clues, as shown in Table 2.

Table 2: Production tests

<i>Write the form that best completes the sentence using the verb given in the parentheses, according to the examples below:</i>	
Examples:	
Mary wanted	<i>to swim</i> (swim) in the morning. (she wouldn't have time for that in the afternoon)
Mathias planned	(wash) the car before the evening. (his car was cleaned at night).

3.3 Instruction

After the Pre-tests, the experimental groups (1A, 1B, 2A and 2B) were provided with two kinds of instruction – explicit and implicit – about the use of infinitives and gerunds in English.

3.3.1 Implicit Instruction

The groups that received implicit instruction had to read a Chinese legend and to answer interpretation questions (which contained the infinitives and gerunds used in this study). After reading the text and answering the questions individually, participants were given cards containing the names and information about the characters of the legend for students to match. Finally, students were asked to write what they could remember from the legend. The post-tests were applied in the following class.

3.3.2 *Explicit instruction*

The members of the groups that received explicit instruction were also requested to read a Chinese legend as the first task, and to answer interpretation questions. However, after these two first activities, participants received different cards to match: some contained the beginning of sentences about the text, and some contained the continuation of these sentences (these cards also contained the infinitives and gerunds selected for this study). At this moment, students' attention was directed to the use and to the structuring of infinitives and gerunds. Students were requested to point out the differences – in terms of meaning – between the two sentences, in order to emphasize the semantic criteria in using infinitives and gerunds. Several other examples were given by the teacher and discussed by students. Right after, students were given a handout containing explanations about the topic, based on Yule (1998), and “fill in the blanks” exercises (similar to those used in the pre-test), which were performed and corrected in the same class. The post-tests were applied in the following class, and compared to the tests that preceded the instruction.

3.4 *Data*

The testing and the two types of instruction were conducted by the researcher in three classes, which corresponded to the schedule of English classes of the experimental groups. However, since the participants belonged to different groups with different schedules, the researcher had to ask other teachers to apply the post-tests.

After collecting the data, the tests done by the speakers who attended the three days of testing were selected and analyzed.

4. Results

Table 3: General results – Comprehension tests – Implicit Instruction

Level	Pre-test	Post-test
Group 1A (n=7)	21 (80,76%)	19,85 (76,37%)
Group 2A (n=5)	22,4 (86,15%)	20,8 (80%)
Group 3A (n=22)	21,95 (78,4%)	–

Table 4: General results – Comprehension tests – Explicit Instruction

Level	Pre-test	Post-test
Group 1B (n=10)	20,8 (80%)	21,11 (81,19%)
Group 2B (n=6)	22,16 (85,25%)	21,5 (82,69%)
Group 3B (n=25)	21,4 (76,42%)	–

After the classification and analysis of the data collected, it was observed that there was little variation among the pre and post-tests results. Consequently, one could say that the level of monitoring by the participants was reduced since these tests contained multiple-choice questions with very similar alternatives. Moreover, the degree of commitment from participants also needs to be taken into account, since many students showed resistance and/or lack of interest in the study, besides the lack of concentration attributed to the demands of the course (i.e. tests), or even the lack of knowledge concerning the rules underlying the input they had contact with.

It was also noticed that all groups had a better overall performance concerning the verbs both verb +” to “- Verb + infinitive or gerund). This result can be attributed to the fact that these verbs are considered more complex by students, since the translation of sentences using verbs that accept two types of complement may be different (according to the context). This would result in a greater level of attention to the questions involving this group of verbs. Besides, the results obtained in the study could be attributed to other factors. First, they could be attributed to the election of infinitives and gerunds in English as the topic of instruction: the complexity of such structures may have been crucial for the results.

Above all, this study had the time as its greatest limiting barrier, since instruction (and the reinforcement activities) had to be held in a single class. Notwithstanding these factors, the present work had the purpose of triggering and motivating new research that aims at contributing to the studies about the teaching/learning processes of foreign language acquisition, and of expanding – as mentioned before – the studies in the area of English teaching, so to offer tools to better understand the factors involved in the complex and rich world of learning.

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Sign language acquisition and verbal morphology in Brazilian and American Sign Languages¹

This paper presents some contributions to studies of sign language verbal morphology by looking at the acquisition of Brazilian Sign Language (LSB) and American Sign Language (ASL) in Deaf children with Deaf parents. We observed the verbal production of the children and we verified that, in fact, there is use of different verbal classes from very early ages. We argue that young children have acquired these verb categories, and use them productively, even if infrequently. Our data also support the conclusion that Deaf children acquire a language by *rules*, rather than going through the language acquisition process *piecemeal*.

1. Verbal morphology in sign languages

In Brazilian Sign Language (LSB), American Sign Language (ASL), and every other established sign language investigated, some verbs can be modified in such a way as to indicate information about the people and/or places involved in the event described. This modification is generally known as verb agreement, because it seems that the verb ‘agrees’ with its arguments (or adjuncts). Agreement is usually indicated by the path of the movement taken by the verb, together with the orientation, or *facing*, of the moving hand. Typically, a verb such as HELP moves from a location which indicates the subject referent, toward a location which indicates the object referent. A verb such as MOVE indicates its source and goal locations.

Verbs which indicate subject and object (such as HELP and GIVE) are generally known as (person) *agreement verbs*. Verbs which indicate source and/or goal locations (such as MOVE and GO) are known as *spatial verbs*. Verbs which are not modified for person or location (such as LIKE or KNOW) are known as *plain verbs*.

There have been a number of approaches to analyzing this system. Questions to address include the following:

¹ Ronice Müller de Quadros’ research was supported by the Brazilian National Council for Research, CNPq Grant #301993/2004-1. Diane Lillo-Martin’s research was supported in part by NIH Grant #DCD00183, and the University of Connecticut Research Foundation. A preliminary version of this work was presented in the “Workshop on Sign Language Verbal Morphology” at the *Linguistic Society of America Summer Institute* in 2005. We thank the students, research assistants, and especially the children and their families who collaborated in this research.

- (1) How are the verbs which participate in this system classified? Padden (1983, 1988, 1990) presents the three verb categories of ASL as listed arbitrarily in the lexicon. Then, each verb would simply have some indication as to which category it belongs. Moreover, she points out that plain verbs may have locative markers as well, but these would be considered a kind of clitic rather than agreement. Others have investigated ways in which the classification of a verb might be determined on the basis of semantic/thematic grounds (JANIS, 1992; MEIR, 1998, 2002; RATHMANN; MATHUR, 2008). More recently, Quadros and Quer (2008) have pointed out that the classification of verbs is not static, either listed arbitrarily in the lexicon or determined on the basis of thematic structure. Rather, whether a particular verb will show agreement or not is a function of morpho-syntactic factors of the particular (sentential) context. In the present paper, we provide evidence in favor of this latter position, since we have observed that verb ‘categorization’ fluctuates both for children and adults.
- (2) What is the mechanism of verb agreement? As Casey (2003) points out, some researchers describe the directionality shown in agreement verbs as a syntactic mechanism to establish grammatical relations between the subject and the object (PADDEN, 1990; KLIMA; BELLUGI, 1979). Some focus on the relationship between the verb and referential loci (ARONOFF; MEIR; SANDLER, 2005; LILLO-MARTIN; KLIMA, 1990; MEIER, 1990). Some focus on the semantic aspects of agreement marking (SHEPARD-KEGL, 1985). Still others look at the semantic and syntactic aspects of the agreement controllers (JANIS, 1992). Finally, others deny that this system is part of the grammar at all: Liddell (1995, 2000) argues that what is known as agreement is determined by independent reasons which are essentially gestural, that is, there is no linguistic specification of the points between which the hands move, but what happens is that the hands move to locations which represent mental entities.

In the data from adults as well as from children using LSB and ASL, the systematic use of null arguments licensed in the presence of verbal agreement can be observed (LILLO-MARTIN, 1991; QUADROS, 1995); furthermore, the use of agreement with the object is obligatory (although it is not so with subject agreement) (PADDEN, 1988; BAHAN, 1996; QUADROS; LILLO-MARTIN; MATHUR, 2001). Such restrictions can indicate that agreement is a grammatical phenomenon.

Other important questions related to the classification of verbs are still debated. Among them, we mention the following:

- Is there a consistent form that will be used if a verb belongs to a specific category?
- Are verbs lexically categorized for one or another category or can they change from one classification to another in different syntactic contexts?
- What are the conditions that apply to the expression of verbal morphology?

We believe that sign language acquisition studies can bring some light to this debate. When we analyze early productions of signing children, we observe grammatical and semantic elements being used by children in different syntactic contexts of verbal production. We will present next an overview of previous verbal morphology acquisition studies, then we will go through our studies and the results bearing on these issues.

2. Acquisition of verbal morphology in sign languages

The questions that drive our research are the following:

- How are the categories of ‘agreeing’, ‘spatial’, and ‘plain’ verbs identified?
- Why have recent studies reported different results regarding children’s errors in verb agreement?
- Do children learn sign language verb agreement from early on?

Many studies have shown relatively late acquisition of agreement in ASL and other sign languages. Meier (1982) analyzed ASL acquisition and found that there is some verb agreement used in the earliest sessions; there are also errors of omission found until after age 3, and he found as well some occasional errors of commission. Similar patterns have been found in other studies with other sign languages: a few errors of commission, and frequent omission of obligatory agreement until at least age 3 (CASEY, 2003 for ASL; HÄNEL (ms.) for German Sign Language; MORGAN; WOLL, 2006 for British Sign Language).

On the other hand, Quadros, Lillo-Martin and Mathur (2001) found early acquisition of verb agreement by children acquiring LSB and ASL. This project involved longitudinal study of verb agreement acquisition by two children learning ASL (JIL and SAL) and one child learning LSB (ANA), ages 1;08-2;10. They found that children almost always used correctly inflected verbs; overall, plain verbs were used more frequently than inflected verbs; and verbs rarely were missing obligatory agreement. Moreover, Berk (2003), analyzed data from one deaf child in later sections (Jill, from 24 to 60 months) and observed agreement acquisition without errors.

These studies lead to some additional questions:

- Why did Quadros, Lillo-Martin and Mathur (2001) and Berk (2003) not find verbal agreement errors (omission and commission), while the previous researchers had found different results?
- Are there differences between the studies in the verbal classification and the contexts considered for obligatory agreement?

Moreover, we have to consider further theoretical questions. Children acquiring some languages (like English) have ‘errors’ of omission in the verbal agreement for a specific period; while children acquiring other languages (such as Italian) produce a lot fewer errors of this kind. These differences can be related to different morphological systems of each language (HYAMS, 1992; SLOBIN, 1986; WEXLER, 1994). In this sense, some researchers proposed that children acquiring a language like Italian

establish earlier the verbal morphology than the ones acquiring languages like English because of the rule system involved (HYAMS 1992; HOEKSTRA; HYAMS, 1998). On the other hand, some authors have proposed that the low proportion of the frequency of the forms (for example, plural) reflects piecemeal acquisition of the linguistic categories, even if there are few errors produced (PIZZUTO; CASELLI, 1992; RUBINO; PINE, 1998). Then, do the inflectional forms acquired result from piece by piece acquisition, or by a rule system? How can sign language acquisition contribute to this discussion?

3. Our research

Here, we present an analysis of verb agreement acquisition using longitudinal data from two children between the ages of 1;08 and 2;04: one (Leo) acquiring LSB, and one (Aby) acquiring ASL. For the present study, we employed a more detailed separation of verb type and sentence/discourse context, as well as an examination of adult data, in comparison to our previous research.

Each child was filmed with her/his Deaf parents or with a fluent signing experimenter at home or at school in a natural environment, with her/his toys and books, as well as with some sets of toys and books brought by the experimenter for this project. Thirty- to sixty-minute sessions were filmed weekly or biweekly. Only utterances with at least one verb were included in the present analysis. The number of utterances analyzed in each session is given in Table 1.

For each verb, we look at the initial point and the end point (location and/or orientation). If the child's production shows person agreement we categorize it as [+person]; if it shows location agreement we categorize it as [+loc]; if it shows no agreement we categorize it as [plain]. Classifiers (handling, SASS, semantic) were treated separately. Possible errors of omission or commission are marked for further study.

Table 1: Utterances analyzed by session

Age	Aby	Leo
1;8		31
1;9		26
1;10	43	20
1;11		81
2;0	34	
2;1		84
2;2	37	166
2;3		39
2;4	97	36

We split the analysis into three parts. For the first step, we looked at the verbal categories used by the children: plain verbs, agreement verbs, spatial verbs, classifiers and handling verbs², gestures (we followed Casey's, 2003 criteria for identification of gestures³). To identify agreement, we considered verb transitivity, animacy of the arguments, trajectory of the movement and orientation or facing of the hands. In the second step, we analyzed the morpho-phonological forms of agreement used (location, path, and orientation) and, also, the force of the sentence type (imperative, request, declarative). In the last part, for one session each, we analyzed the verb productions of adults with the child (usually the mother), looking at the verbal morphology following the same criteria established with the children (for Leo, it was the session when he was 2;1, containing 87 adult utterances; and for Aby, the session when she was 2;0, with 78 adult utterances).

In the first step, we observed that the productivity of plain verbs was much higher than that of the other verb types. Agreement verbs were infrequent, but correctly marked. The locative agreement was more productive with spatial verbs than with plain verbs. The overall results are presented in Figures 1 and 2, with data across time in Figures 3 and 4. The results are consistent with those of Quadros, Lillo-Martin and Mathur (2001).

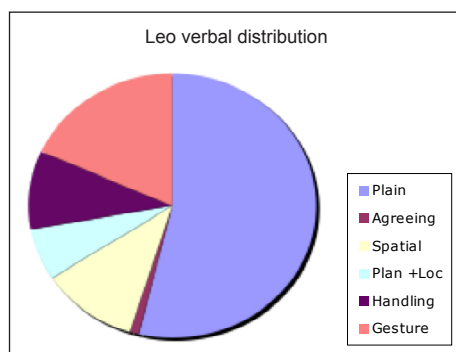


Figure 1: Leo's verb distribution (LSB)

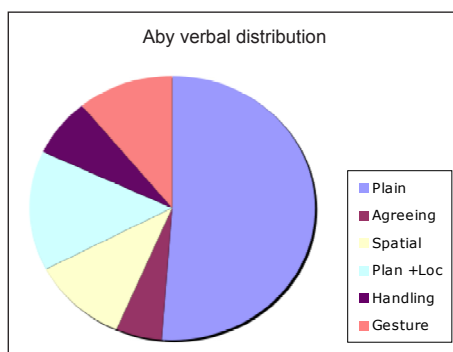


Figure 2: Aby's verb distribution (ASL)

² Classifiers are used in LSB and ASL with some specific configurations of hands that can incorporate the noun, the verb and respective inflections. Also, there are other verbs that can be considered as a kind of agreement/spatial verb that also has some properties of classifiers, the *handling verbs*. These verbs can incorporate an instrument or object in the sign; for example, in PUT-CAKE-IN-OVEN, the verb uses the classifier for holding an object that in this case is the cake and makes the movement for putting the cake in the oven, all in one sign. These verbs can also have aspectual inflection.

³ Casey's criteria for identification of gestures include the following: mimics of actions, the use of arms held out straight to ask for something or to reach toward something, native signer judgments.

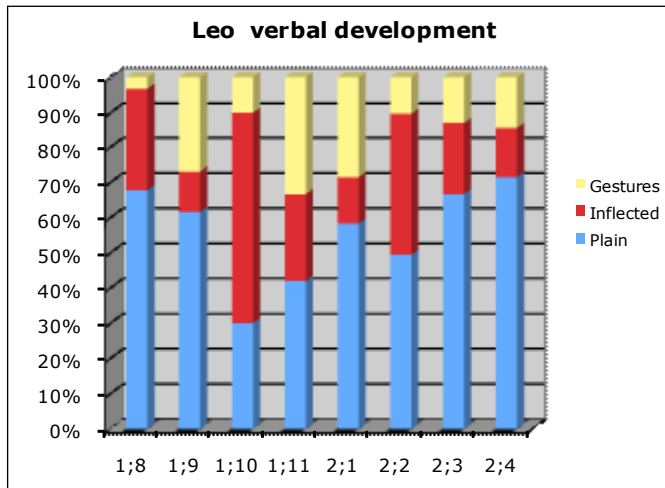


Figure 3: Leo verbal development (LSB)

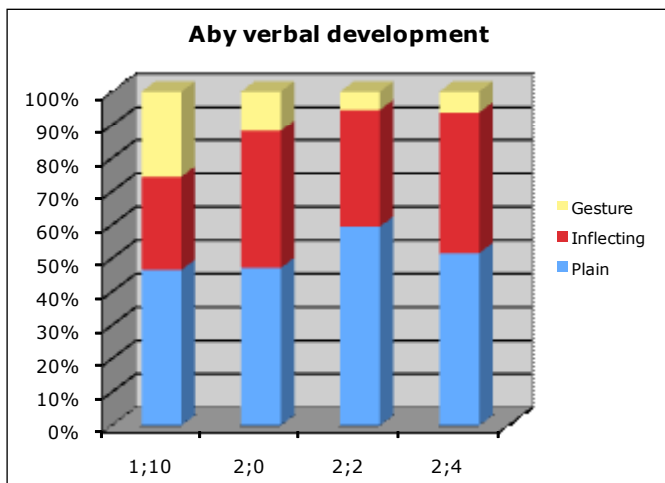


Figure 4: Aby verbal development (ASL)

Examples of verbs used with inflection in child LSB:

Leo: COME, GET, PUT-IN, GIVE, BRING, BITE

(2;1) CAT WANT <it>BITE<me> IX<me>

‘The cat wants to bite me’.

(2;1) <you>COME<here> PRAY BLESS PRAY IX<picture>

‘Come here to pray to bless (with me with the angel from the picture)’.

Examples of verbs used with inflection in child ASL:

Aby: FEED, GIVE, PICK-UP, PUT, COME, BOTHER, HELP, BRING, GO

(1;10) REMOTE-CONTROL IX<there>...

MOM, <me>GIVE<mom> IX<remote-control>.

MOM <me>DAR<mom> IX<mom>, <me>GIVE<mom>

'I give the remote-control to my mom'.

We examined the children's uses of gestures to see how they compared with the use of verbs having agreement. We found that the children often used both a gesture and a sign in sequence (e.g., SIT/g(sit-here); GIVE/g(gimme)). Signs used with gestures were not missing obligatory agreement (e.g., aGIVE1), although the gestures sometimes added location information to a plain verb (e.g., SIT). We conclude that it is not that the children are using gestures because they do not have a sign as an option. In fact, they are using gestures in the same way that hearing children use them when they are acquiring a spoken language.

In the second step, we looked in more detail at potentially inflecting verbs which were used with a neutral location for agreement (that is, the usual agreement movement was absent or reduced) (21/135=15% for Leo and 4/80=5% for Aby). We found that the facing of the hand is correctly marked in these verbs, indicating that they do not have a complete lack of agreement. Furthermore, these forms were used in imperative or request contexts – contexts in which adults also permit such a reduction in agreement marking.

Examples of imperative/request forms in LSB:

Leo: GET, THROW, GO

(2;1) GET <imp> GET <imp> CANDY

GET <imp> CANDY IX<there>

GET <imp> GET <imp>

'Get the candy there'.

Examples of the imperative/request forms in ASL:

Aby: GET, MOVE, PUSH

(2;2) PUSH<imp> IX<toy>

'Push the toy'.

For the last step, we analyzed the input to the children. We observed that the verbal distribution of the interactor is very similar to that of the children, even if the input shows fewer gestures and more agreement verbs. Moreover, the data indicate that the input shows imperatives and requests with neutral or reduced agreement marked on the verb, exactly what was observed in the children's productions.

Examples of neutral/reduced form in the input:

Aby (2;0)

<Aby>GIVE<Bob> POSS<Bob> DRINK, <Aby>GIVE<Bob> PLEASE.

YOUR DRINK <neutr>GIVE<Aby>.

IX<Bob> <Bob>GIVE<Aby> IX<Aby>.

(Aby) give (to Bob) his drink, please, give (it to him). You give (it) to him.

Leo 2;1

BATATA <cozinha>PEGAR<neutral>

A batata (o garçon) foi pegar (na cozinha).

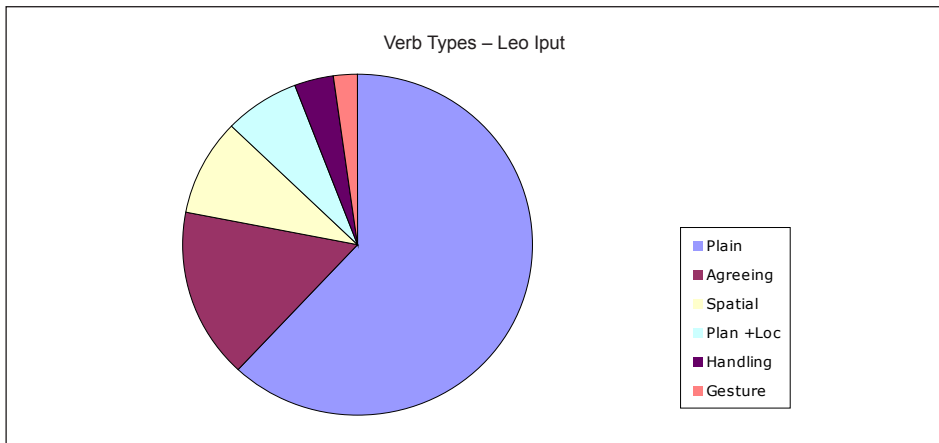


Figure 5: Verbal distribution of the input to Leo (LSB).

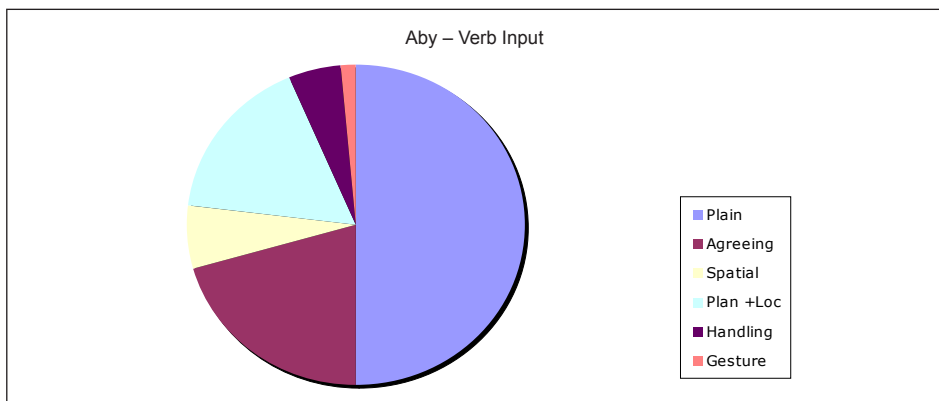


Figure 6: Verbal distribution of the input to Aby (ASL).

4. Discussion

The data from our acquisition study can be applied to the question of verb classification raised earlier. The data from the children offer evidence for a proposal in which the verbs are classified by their morpho-syntactic context, not by a lexical listing, showing that the classification is not rigid, as Quadros and Quer (2008) concluded. For example, some verbs can be used as plain verbs or can be associated with locatives (plain plus loc), such as LEAVE, DROP and STAY in both languages. Other verbs can be used with person agreement, location agreement, or no agreement on the subject, such as COME and GO. Both the children and the adults in this study used verbs in this variable way.

Our current results and the results found by Quadros, Lillo-Martin and Mathur (2001) may have differed from other results found in previous studies because we used these flexible criteria to classify the verbs. In addition, we analyzed the neutral and reduced forms produced by the children and found that they are grammatical instances of imperative forms, used by adults as well. Furthermore, we used facing as well as path and location to identify agreement and we looked at eye gaze as additional information regarding the presence of agreement.

In order to address the question of productivity, we looked at agreement types as well as tokens. We found that the overall pattern of results is very similar using a types analysis as the results presented above by tokens. Multiple types of inflected verbs were used by the children from the earliest ages observed.

The locative agreement (spatial and plain+loc in the graphs) was highly productive. The children used many different verbs with location agreement, and they used this agreement with different referents. Locative agreement on verbs like COME, THROW, PUT, GO, BRING, STAY were common in the children's productions.

The person agreement verbs (such as GIVE, LOOK-AT and HELP) are less frequent than the location agreeing verbs. However, person agreement can also be considered productive, because different appropriate forms are used in different discourse contexts. For example, the sign GIVE was used with first-person subject and second-person object in one context, and with the opposite pattern in another context, as shown in the examples below:

Aby (2;4)

<me>GIVE<you> APPLE

I give you an apple.

DOLL <you>GIVE<me>

You give me the doll.

It is important to recognize that unlike spoken languages, the actual form of a correctly agreeing verb cannot be a memorized, unanalyzed whole. The location toward which the verb moves is determined by the actual physical location in the

current context of the referents involved (abstract locations are used for non-present referents, but the children's early productions are almost all with present referents). In order to use the verb correctly, the child must calculate the form of the verb for the current context. Thus, even a small number of cases can be enough to show productivity of the rule.

If children were to acquire sign language verb agreement piecemeal, they would learn isolated forms, not putting together morphemes as they do under a rule system. Then, they might have memorized a form with movement away from the signer, for example, which is applied in different contexts no matter where the referent is actually located. This is not what we found. The use of different locations for non-first person referents shows evidence of productivity and it offers strong evidence for acquisition following a system of rules.

5. Conclusions

The acquisition of verbal morphology in LSB and ASL supports the proposal that verbs are not classified lexically as 'agreeing' or 'plain', but rather that agreement is used in particular morpho-syntactic contexts. Moreover, it brings support to the grammatical status of agreement in sign languages, bringing some light to this debate, since the realization of the agreement markers depends on the kind of the structure that is being derived following strict rules. Children acquiring LSB and ASL show semantic and grammatical agreement productively and also present neutral and reduced forms licensed in specific grammatical contexts, such as the imperative constructions. Verbal morphology acquisition is ruled by a system of rules very early, independently of the frequency of the verbal production.

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Development and validation of a foreign language linguistic awareness instrument

1. Introduction

Shohami (1994) comments that, although tests can contribute to theories and research in the area of second language acquisition, the lack of quality standards for instruments may lead to misinterpretation and consequent erroneous conclusions about programs and methods of teaching foreign languages. In his view, a test must undergo a validation process and should take the first language of the respondent into account, as the native language interferes with the process of learning a foreign language.

In 2006, Raymundo conducted a study that aimed to develop and validate an instrument to assess the level of linguistic consciousness of adult learners of English, native speaker of Portuguese. The instrument was constructed after the submission of correct and incorrect sentences, focusing on interlingual and intralingual errors¹ and affirmative, negative and interrogative forms of different tenses and aspects (simple past, simple present, future, present continuous, past continuous, present perfect).

2. Instruments validity and reliability

A test of education is, as mentioned by Dryer (*apud* VIANNA, 1978), a process that begins and ends with a human judgment. To minimize the possibility of subjective judgments and transform a test into an instrument, for the purposes of verification and evaluation, it is important that you have two basic requirements: reliability and validity. Validation is the process of examining the accuracy of a given prediction or inference made from the scores of a test. The validity of a test begins at the moment you think of building it and it continues throughout the entire process of design, implementation, correction and interpretation of results. The interpretation of the

¹ Intralingual errors: errors that occur in the foreign language and do not come from mother tongue interference. Examples of this type of error are: *Where does she works?* Instead of *Where does she work?* to express the idea: “Onde ela trabalha?”, *I have studied yesterday*, instead of *I studied yesterday*, to express the idea: “Eu estudei ontem.” Interlingual errors: errors arising from the transfer of forms and meanings of native language (Portuguese) to a foreign language (English). Examples: *She works in a hospital?* Instead of *Does she work in a hospital?* to express the idea: “Ela trabalha num hospital?”; *How long do you study here?*, instead of *How long have you studied here?* to express the following idea: “Há quanto tempo você estuda aqui?”.

validity of a test also requires the calculation of different coefficients. There are three aspects of validity that correspond to the objectives of a test. They refer to content validity, criterion validity and construct validity.

Content validity refers to the analysis of the instrument, whether it really covers all aspects of its object and contains elements that can be assigned to other objects. It is not statistically determined, but it is the result of expert examiners observation, who analyze the representativeness of the items in relation to the areas of content and relevance of the goals to be measured.

The purpose of criterion validity is to verify whether the instrument is able to identify those which are actually better for a particular activity. Criterion validity refers to the degree of correlation between test scores and other performance measures (criterion) obtained independently or simultaneously to the test.

Construct validity helps you determine which educational characteristic explains the variance² of the test, and what the meaning of the test is. Construct validity refers to how well the instrument actually measures the variable it intends to measure. The evidence needed for this type of validation is obtained by making a series of studies, using statistical tests of the theoretical constructs on the relation between variables to be measured. This type of validation is intended to detect, among other things, those variables with which the test scores are correlated, what types of items make up the test, the degree of scores stability under different conditions and the degree of homogeneity³ of the test, in order to have elements that clarify the meaning of the instrument.

From this type of validation, the researcher shall make assumptions about the theory of constructs and test them empirically, especially when he wishes to better understand the cognitive and psychological issues that are being measured by the test. For this study, we intend to diagnose what level of language awareness the student shows when correcting interlingual and intralingual errors and what degree of confidence the learner presents on different levels of linguistic awareness.

For a valid test, reliability is important. The reliability of the test, for example, indicates the extent to which differences in scores are due to variation in the examined characteristic, not to casual errors. It also refers to the stability of the results of a test, the degree of consistency and accuracy of scores. Operationally, the reliability can be defined as the correlation coefficient between at least two measures. There are different methods to calculate it. In this study, we used the split-half method, which is used when a single form of the test is applied in a single session and when you want to know the influence of sampling, but not the range of responses. In this case, the items of the test were divided in two equivalent halves.

² Dispersion of scores measured considering the average.

³ The analysis of the test homogeneity indicates whether the test measures a single feature or whether, instead, it measures several features. Homogeneity is obtained by measuring internal consistency.

The calculation of reliability can be influenced by several factors (VIANNA, 1989). Among the factors related to the instrument that may affect the reliability of the test are: number of items (the higher the number of items, the more reliable), degree of difficulty of the items (items with an average degree of difficulty are those that contribute most to reliability); homogeneity of the test (the more homogeneous the test in its composition, the more reliable). Factors related to the respondent refer mainly to motivation (tests performed by motivated examinees have high reliability), the comprehension of instructions (when the instructions are not clear and the respondents do not understand what is required, the accuracy of responses and the reliability of the instrument are not acceptable) and the characteristics of the respondent (knowledge, skills, emotional reactions, effort and luck in the selection of responses by “guessing” may alter the reliability of the test).

3. Instruments development methodology

The construction of a test that uses psychometric measures is only possible due to accessibility to computers and statistical packages, since it involves calculations too complex to be resolved manually. In this study, we used the software SPSS (Statistics Package for Social Science, version 11.5, Reliability Analysis).

Moreover, the construction of such a test must follow, according to Kline (1995), this sequence: (1) theoretical basis for the test, when literature review and exploratory studies of the object you want to evaluate are conducted, especially when there is a lack of technical literature to justify the formulation of items, (2) formulation of test items: a higher number of items is elaborated; (3) preliminary difficulty analysis of items: expert examiners observations; (4) reliability analysis: verification of the test internal consistency; (5) validation of the final set of test items to demonstrate that it is not just a random abstraction, but a construct that allows an understanding of the object in question; (6) standardization: description of the test implementation, evaluation and interpretation process. Kline states that the number of items in a test should not be too high and that the application should not exceed one hour for adult learners.

The procedures used to validate an instrument to assess the level of linguistic consciousness, inspired by Schwab (1976) and Freedman and Stumpf (1976), implies nine stages that make up three versions of the instrument to be validated. A framework was developed to understand the validation process proposed by Raymundo (2006).

The validation process involved the preparation of ten instruments, which served as errors collection instruments; as initial instruments of linguistic awareness; as a final instrument of linguistic awareness; and as a performance instrument. The application of these tests was carried out at four different times. In the first half of 2004, four data collection instruments were applied in a sample of 114 students; in the second half of the same year, four initial instruments were used in a sample of 102 students. The

third stage involved the application of a final language consciousness instrument in a sample of 104 students in the first half of 2005. Finally, a performance instrument was applied in a sample of 74 students in the same semester.

Table 1: Procedures used to validate the instrument

Instrument	Stage	Procedure
First version (Errors collecting)	1) Collection of items	Collect errors that will compose the instrument.
	2) Analysis of redundancy aggregated to composition	Group errors according to the similarity of the items and the composition of the instrument.
	3) Content validation	Analysis of the representativeness of the items by expert examiners.
Second version (Initial instruments)	4) Initial instruments	Initial composing tools and application.
	5) Construct validation: instrument and item reliability	Statistical procedures designed to calculate reliability coefficients for the instrument and measure the internal consistency of each item and each part of the instrument.
	6) Construct validation: retention of an item in the final instrument	Check the degree of contribution of each item to the composition of the third version of the instrument: items with an average degree of difficulty and a high degree of discrimination can be maintained.
Third version (Final instrument)	7) Final instrument	Final instrument composition and application in a sample similar to the sample used for the preparation of the second version in order to make final adjustments.
	8) Construct validation: item and instrument reliability	Statistical procedures designed to calculate reliability coefficients for the instrument and to measure the internal consistency of each item and each part of the instrument.
	9) Criterion validity	Verification of a possible correlation between the scores of the language awareness test and the scores of a performance test.

4. Construction of the instrument

In order to work with empirical data, exercises of errors collection were created. With the title: How would you say that in English?, these exercises contained sentences in Portuguese to be translated to English. Due to the large number of sentences, they were divided and grouped in four instruments. Each was composed of 20 simple

sentences in Portuguese which involved the use of the following aspects of English grammar: simple present, simple past, future with going to, present continuous, past continuous, present perfect. Affirmative, negative, and interrogative versions of the same sentences, including yes/no and wh questions, were distributed among the four exercises.

Ex.: *How would you say that in English?* (INSTRUMENT 1)

- 1) Ele está com fome. (*He's hungry.*) _____
- 2) Ela não está com dor de cabeça. (*He does not have a headache.*) _____
- 3) Você está aqui há bastante tempo? (*Have you been here for a long time?*) _____
- 4) Onde fica o correio? (*Where is the post office?*) _____

The four initial instruments of linguistic awareness were designed with the data obtained in the errors collection instruments. The initial instruments were organized as follows: each instrument was divided into two parts. The first consisted of four identification data and the second of twelve questions to be answered. The identification data included the full name of the informants, their age, their level of English at the institution (PUCRS) and their course. The twelve sentences in English to be analysed were underlined and belonged to dialogues. Four sentences were correct and eight incorrect. For each dialogue there was a chart to be completed by the respondents. The learners were also requested to inform their degree of confidence in relation to their responses (I am not sure – not sure, I'm almost sure – almost sure, I am completely sure – totally sure).

Ex.: INSTRUMENT 2

Part 1 – IDENTIFICATION DATA

() Male () Female

Age:

Level in the English course:

Academic course:

Part 2 – RIGHT OR WRONG?

A: My two best friends are veterinarians.

B: Really! Where they work?

A: They are out of work.

Observe the underlined sentence and answer the following questions	not sure	almost sure	totally sure
Is the sentence right or wrong?			
Where is the error?			
Which is the correct form?			
Why is this the correct form?			

To compose the final instrument, four types of analysis were used. The first analysis was to make a comparative evaluation of four initial instruments, considering the reliability coefficients. The second was to make an evaluation of all items of each original instrument, considering the level of difficulty and the level of discrimination. The third was the selection of items considered good and the elimination of items that should be rejected for not contributing to the accuracy of the instrument. The last type of analysis was to search for the best items of all instruments and to compose a single instrument – the final instrument.

A large number of items initially composed the final instrument, because after its application, its reliability would be recalculated and, depending on the coefficient obtained, it might be necessary to remove items to increase the accuracy of the instrument. The selection, structure and composition of the final instrument were organized into a framework.

Table 2: Selection, structure and composition of the final instrument

Selected item	Underlined sentence	Tense and aspect	Type	Group
1 (Instr. 2)	1. <i>Where they work?</i>	<i>Simple present</i>	<i>Wh question</i>	interlingual error
10 (Instr. 1)	2. <i>Do they always make a trip on their holiday?</i>	<i>Simple present</i>	<i>Y/N question</i>	right
3 (Instr. 2)	3. <i>She found her book in the library?</i>	<i>Simple past (irregular verb)</i>	<i>Y/N question</i>	interlingual error
4 (Instr. 2)	4. <i>He is studying at the moment?</i>	<i>Present continuous</i>	<i>Y/N question</i>	interlingual error
5 (instr. 1)	5. <i>What are you going to do tomorrow?</i>	<i>Future</i>	<i>Wh question</i>	right
6 (Instr. 1)	6. <i>How long are you here?</i>	<i>Present perfect</i>	<i>Wh question</i>	interlingual error
3 (Instr. 3)	7. <i>When she studied English?</i>	<i>Simple past (regular verb)</i>	<i>Wh question</i>	interlingual error
4 (Instr. 3)	8. <i>They were studying yesterday afternoon?</i>	<i>Past continuous</i>	<i>Y/N question</i>	interlingual error
5 (Instr. 3)	9. <i>She taught English from 1987 to 1999.</i>	<i>Simple past</i>	<i>Affirmative</i>	right
8 (Instr. 2)	10. <i>She don't have a headache now.</i>	<i>Simple present</i>	<i>Negative</i>	intralingual error
9 (Instr. 1)	11. <i>She didn't found her book in the library.</i>	<i>Simple past (irregular verb)</i>	<i>Negative</i>	intralingual error
11(instr. 2)	12. <i>What does he doing at the moment?</i>	<i>Present continuous</i>	<i>Wh question</i>	intralingual error
10 (instr. 3)	13. <i>Who are you married to?</i>	<i>Simple present</i>	<i>Wh question</i>	right
12 (Instr. 2)	14. <i>I have worked all day yesterday.</i>	<i>Present perfect</i>	<i>Affirmative</i>	intralingual error
9 (Instr. 4)	15. <i>Did you worked yesterday?</i>	<i>Simple past (regular verb)</i>	<i>Y/N question</i>	intralingual error
11(Instr. 4)	16. <i>Are you studying yesterday afternoon?</i>	<i>Past continuous</i>	<i>Y/N question</i>	intralingual error

The performance instrument created was a simple choice test, entitled Choose the best answer. Tests of this type are widely used for evaluation and placement of foreign language students, therefore, accepted as valid for academic purposes. For this study, the test was composed of seven dialogues in English, with numbered gaps to be filled by the informant through the choice of only one of three alternatives suggested below each blank. The instrument was composed of thirty gaps in total. The content of the test involved the same verbal structures used to assess the students' consciousness level at an intermediate level. These structures were: simple present, simple past, future, present continuous, past continuous, present perfect.

Ex.: INSTRUMENT B

CHOOSE THE BEST ANSWER

Fill in a, b or c on your Answer Sheet. An example has been done for you.

Mr. Brown Do you _____ any children?

- a) have
- b) has
- c) had

Harry Yes, I do. A boy and a girl.

◆ *The correct answer is (a) have.*

For compatibility and accessibility reasons, the research sample was composed of students from several courses studying English as an optional subject (levels VI, VII and VIII), from the Languages course (levels I and II) and from the Aeronautical Science course (levels I, II and III) at the Catholic University of Rio Grande do Sul. The professors of all English classes were from the Faculty of Languages and Arts in the same institution.

The questions that oriented the work referred to the validation process, in which an instrument was designed to assess the level of linguistic awareness; and to the degree of accuracy of the instrument obtained through split-half statistical test, internal consistency of each half, maintenance and elimination of items responsible for high precision and low accuracy, respectively. These questions were based on linguistic consciousness levels (RAYMUNDO, 2001), which were operationally defined as preconscious 1, preconscious 2, conscious and fully conscious, when the respondent was able to judge the sentence, identify the error, correct it and/or explain it⁴.

⁴ Levels of linguistic consciousness: unconscious, preconscious 1, pre-conscious 2, conscious and fully conscious. Unconscious level: when the students are not able to judge whether the sentence is wrong or not. This level is not part of conscious experience itself. Preconscious level 1: first level of conscious experience. This stage involves the perception of the error, when the students know how to judge the sentence. Preconscious level 2: second level of conscious experience. This stage involves identifying the error, when the student knows where the error is. Conscious level: the third level of conscious experience. This level involves two stages of observation: observation of the form, when the students know how to correct the error, or observation of the use, when students can explain his correction. Fully conscious level: the last level of conscious experience. This level involves the understanding of the error and involves the correct judgment, identification, correction and explanation of the error.

The instrument validity examination required different procedures for qualitative and quantitative analysis, involving three types of validation (content, construct and criterion). The completion of the validation process revealed that it was possible to construct a valid instrument for assessing the level of linguistic awareness, following the steps proposed. However, the instrument should be enriched with more data, corrected and improved in some aspects. As stated by Vianna (1989), the validation process does not end, it requires continuity and must be repeated many times for the same instrument.

In addition to this, through the instrument, we could assess other topics, in order to complement the research, enrich the interpretation of data and stimulate the development of teaching techniques. It was possible to verify the relation between the level of linguistic awareness and interlingual/intralingual errors; the relation between the degree of confidence and the level of linguistic awareness; as well as the relation between consciousness level and age.

The results also made it possible to compare the consciousness level and the academic course and to observe the level of linguistic awareness of both female and male students. We verified the relation between learners' linguistic awareness levels, considering their courses and their performance. Finally, we proposed a classification of subjects, taking into consideration how they use the conscious process.

The investigation of these issues led to the following conclusions: the level of linguistic awareness before the correction of interlingual and intralingual errors could not be statistically identified, as well as the degree of confidence at the various levels of linguistic awareness. There was no relation between the level of awareness and the age of the student in statistical terms, nor significant difference between the level of linguistic awareness and the academic courses. There was, however, a significant difference between the level of awareness of the female and the male group, the first group showed a higher level.

For the relationship between the consciousness level and the performance of students from different courses, it was observed that there was a correlation between the variables for the students of English as an optional subject and Languages students, but there was no significant relation, considering Aeronautical Science students.

Finally, students were classified according to the use of the conscious process. We then used the theory of Krashen (1982) to redefine his concept of over users, under users and optimal users of the monitor⁵, by analyzing the level of awareness

⁵ The variation observed in the production of the adult learners results from different uses of the monitor. These uses suggest that there are basically three types of learners. The first type uses excessively the monitor and is classified as over user. This learner uses the monitor all the time, constantly checking performance through the conscious process. He is dependent on learning and does not feel safe in using the acquisition system. The second type of learner makes little use of the monitor and is classified as under user. He prefers not to use the conscious knowledge, even under favorable conditions. This type of learner is not sensitive to error correction and uses only the acquisition system to make self-corrections. The third type of learner is called optimal monitor user. This learner uses the monitor, when it is favorable, specially in writing, using the learned knowledge as a supplement to the acquired knowledge. The student, in this case, knows when to use the monitor in order to improve grammatical accuracy without interference in the communication.

and the degree of confidence of each informant. >From this new point of view, we could design a new configuration of the Monitor Hypothesis.

Through this organization, it was observed that most Languages students were classified as optimal users, the students of English as an optional subject, as under users and Aeronautical Science students oscillated between two classifications: under users and optimal users. This oscillation reinforces the lack of relation between awareness and performance regarding this course.

Based on that, we used Schultz (2005) observations, which relates individual characteristics to foreign language monitoring and performance. He said that introverted and less confident students (over users) and outgoing, very confident students (under users) will not benefit much from conscious awareness. He believes that the only ones who will benefit from this type of knowledge are those situated at an intermediate point between introversion and extroversion (optimal users).

Thus, it was found that most of Languages students and part of the Aeronautical Science students are those who possibly benefit from more formal learning. With these observations we question the effectiveness of foreign language formal teaching and propose a reflection on the need to identify learners' personality attributes to enhance teaching techniques. Finally, it is important to mention that learning a foreign language is the result of conscious information, unconscious development of skills, interests and needs of each group and the personality of each student. For this reason, learning a foreign language is a hard task, requiring ability, talent and interest on the part of those who teach. The construction of reliable tests can help teachers diagnose gaps in the teaching/learning process and to develop appropriate techniques for dealing with this complex reality.

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Developing fluency and increasing vocabulary with the task-based method

1. Introduction

This paper describes an ESP task-based vocabulary enhancement project conducted among students studying English language and literature at the International University of Novi Pazar, Serbia. The aim of this specialized course was familiarizing students with technical vocabulary and it concentrated more on language in context than teaching grammar and language structures. The course involved a wide range of subjects varying from medicine to mechanical engineering and focused on the clarification of frequently occurring words, collocations and phrases used in technical literature.

2. Method

Since the majority of graduates from the Department of English Language and Literature find work as teachers in vocational schools or become interpreters in various companies where they have to deal with specialized vocabulary, students of English in at their third and fourth year of study have shown great motivation in taking this ESP-vocabulary enhancement course. Speaking classes were centered round several selected scientific/technical topics and vocabulary acquisition was done in phases. The course had three aims: 1) to get students acquainted with ESP literature and terminology, 2) create a collected database (a dictionary of useful and frequent words and phrases) based on the chosen corpus, and 3) implementation of ESP terminology in a real-life context through a quiz/game created by the students themselves at the end of the course.

In the first stage students were given some reading from a chosen field of science and got acquainted with the terminology and the use of particular constructions. In the second stage of vocabulary acquisition the ESP teacher invited a subject specialist (an engineer, doctor, economist or lawyer, etc) as a consultant and advisor who helped in clarifying some of the most difficult terms and constructions. The third phase involved exercises simulating real-life situations when the students had to implement their technical vocabulary in use and edit the final version of their dictionaries containing frequent key-words, useful phrases and collocations.

Picht and Drascau (1985) state that there are two essential factors involved in the training of translators/interpreters: One is the professional competence in relation

to the special field and the other, the linguistic proficiency in the LSP of both source and target language.

When dealing with specialist texts, the student needs at least a working knowledge of the domain or subject-field concerned, i.e., needs to be familiar with the underlying concepts and constructions, and their linguistic interpretation, of both source and target language, thus ensuring the use of accurate terminology and stylistically appropriate phraseology, which comprise the LSP.

This has become even more unavoidable in recent years with the increase and growing need for effective intercultural communication i.e., the accurate transfer of specialist linguistic elements.

Students of English language who will be working as vocational teachers of English or translators/interpreters need to be equipped with fundamental knowledge in science and technology during their studies which they will broaden later depending on the area they specialize in.

The aim of the course introduced at the International University of Novi Pazar was to acquaint students, who had a fairly good background knowledge in linguistics but were non-specialists in a scientific or technological field, with basic scientific concepts and principles so that they may understand what they read in scientific, medical, legal and technical texts which they will have to deal with as professional translators. It was expected that if students of English (language professionals rather than subject specialists) were acquainted with basic knowledge in science and technology, they would be able to make more appropriate choices when they come across terminological and nominal and verb phrase problems in translation of LSP texts and would be able to convey the information contained therein more clearly and accurately. Though Neubert (1992) argues that subject competence is of lesser importance than language and transfer competence, it is obvious that students need to be familiar with the basics of a particular scientific field in order to tackle the complexities of such texts. Helme and Javed (1994) hold that students need to be technically literate, to be able to make sense of science and technology texts.

Some experts say that teaching technical vocabulary is not the responsibility of the teacher, but the ESP teacher should give priority to teaching semi-technical and core vocabulary (high-frequency words of general vocabulary which occur in technical and scientific texts). In practice, however, it has become obvious that students should be given some essential knowledge about a particular field. If they have very little knowledge about a particular field their linguistic knowledge will be insufficient for translating and/or interpreting the text correctly.

Students at the International University of Novi Pazar were enthusiastic about this ESP course mainly because they saw the beneficial sides of becoming technically literate. However, they had their own approach to education and found a course in a discipline not their own 'very demanding' mainly because it was 'full of unknown terms'. They were non-specialists in the fields of science and had only general high-school knowledge of those disciplines. Some students were more interested in

scientific issues, therefore were better informed about science and technology, while others had not dealt with such topics since high school. Even if students of English were interested in scientific issues and informed about the latest developments and achievements in the world of science and technology, they were not scientists and an LSP text was a barrier. Science uses language sparsely and precisely, and ordinary words acquire specific meanings, and these meanings may be quite different from what they are in other contexts (TOBIAS, 1997).

The aim of the course was not to produce trained scientists but to give students access to a wider range of scientific domains, which may be of some use in their work. Students were expected to learn the basic scientific constructions and acquire a good grounding in the phraseology and terminology of science.

3. The First Phase

At the beginning of the course the objectives were stated and students were given an overview of the ESP course.

The ESP instructors tried to cover as many fields of science as possible but the reading assignments within each field were carefully developed for obtaining a better effect, and started with reading passages containing the definition of terms and progressed to concepts, principles and their applications. The ESP instructors at the International University of Novi Pazar encouraged students to conduct self-study and search for explanations of specialized vocabulary and constructions on the internet. Self- and peer-teaching was believed to be better than giving students elaborate word-lists with their possible translation equivalents in Serbian. The ESP instructors thought that ready-made notes would make students feel overconfident and overly dependant on the given material.

Daniel Gouadec (2003, p. 68) points out that ESP can be taught by ‘whoever is willing to do it’. Our experience has shown that the combined method works best: a linguist trained in scientific and technical terminology with a professional experience and some knowledge about particular fields of science and technology on one hand, and a professional expert (a subject specialist) who has a basic knowledge of the complexities of the translation process on the other. Students, the ESP teacher as well as the subject specialist have to cross the boundaries of their existing knowledge and move to a field of study which they may, at times, find unpleasant but challenging. Non-subject specialists learn the basics of a particular scientific field and subject-specialists are acquainted with the complexities of translation possibilities, ambiguities and variations. Consultations with subject specialists make students feel confident that their interpretation is correct and they have made a step forward in becoming technically literate.

When comparing the two languages in question, English and Serbian, many terms are cognate and have the equivalent term in the students’ first language. If the term is not cognate, and therefore unfamiliar to students, it should be explained. In

most cases there is an exact one-to-one translation equivalent for technical terms and translating them into the students' L1 is sufficient.

There are six different types of vocabulary found six in technical/scientific language which can be narrowed down into two broad categories: 1) the vocabulary used in general language which has a higher frequency of occurrence in specific technical and scientific description and discussion and 2) vocabulary that has a specialized and restricted meaning in certain disciplines and which may vary in meaning across disciplines.

The first group often includes nouns such as: *factor, method, model, function*, adjectives like *relevant, important, considerable*, verbs: *accept, agree, confirm*, etc. while the second group includes words such as the specific meaning of *stress* in mechanical engineering, *bug* in computer science, and the like.

At the beginning of the course the participants of this ESP speaking class at the International University in Novi Pazar were assigned a home-reading task from a chosen field of science and were later given a free hand in choosing the additional authentic reading material. The task was to read the text, select topic-related keywords, frequently used words and collocations and find translation equivalents or provide definitions for the keywords in English monolingual dictionaries. The reading material represented a sample-corpus including several different scientific topics.

There are numerous ways of finding the meaning for an unknown word. These include a definition in the second language, a demonstration, a picture or a diagram, a real object, L2 context clues, or an L1 translation. In terms of the accuracy of conveying meaning, none of these ways is intrinsically better than any of the others. However, studies comparing the effectiveness of various methods for learning always come up with the result that an L1 translation is the most effective. This is probably because L1 translations are usually clear, short and familiar, qualities which are very important in effective definitions. In the initial phase of our course the use of L1 translation equivalent was found useful in some cases because it was the most concise, unambiguous and useful for future ESP teachers and interpreters.

4. The Second Phase

The second phase of acquiring ESP vocabulary focused on clarifying some of the keywords and terms necessary for the understanding of the text. Students were uncertain and felt uncomfortable with texts they did not fully comprehend. The ESP instructor urged her students to seek self-study and help from professional experts in such cases. Inviting subject specialists to class and having a chance to confirm some uncertainties and doubts about the meaning of keywords helped students feel more at ease with the assigned texts. Both the students of English and the professional experts approached the reading material from a different angle. Students of English had to cope with the translation difficulties and learn some basic concepts and constructions in the particular scientific area while professional experts inevitably got involved

with linguistic issues. Later during the course, students chose other reading passages from the same field and at the end of the month created a small dictionary containing words, phrases and collocations from each assigned scientific area.

By the end of the semester participants of the course have compiled all the technical keywords and useful phrases from each assigned field of science into a common database and created a game similar to the ‘Who Wants to be a Millionaire?’, based model on the backbone vocabulary from each topic. The questions were rated ‘easy’, ‘medium-hard’ and ‘difficult’ and were based on the information gathered from the students’ readings and the given internet sites. More advanced students created a collocation game while less ambitious students compiled a ‘scrambled idioms’ puzzle for in-class acquisition of basic collocations from the model-corpora. Students learned the basic terms and constructions in several selected scientific fields and practiced the most frequent words and collocations contained in the collected corpus through the game they had themselves created. Students were all aware that practicing specialized vocabulary would provide them with the very basic background scientific knowledge and showed great interest in putting the quiz questions together. The main purpose was acquiring some knowledge from several different specialized fields of science that could later serve as a foundation for further specialization depending on the company/school the students would work for.

While taking part in the ‘Who Wants To Be a Millionaire’ game the students practiced the definition and/or translation of terms, frequently occurring collocations as well as the description of processes by having to explain a manufacturing process, chemical reaction, illness or taking part in other simulated real-life situations and tasks. The questions being rated ‘easy’, ‘medium’ and ‘difficult’ offered students a chance to focus more on the certain scientific field of their future company/factory/school.

Expanding vocabulary learning to collocations and semi-fixed phrases was based on the belief that language consists not of traditional grammar and vocabulary, but often of multi-word prefabricated chunks including collocations, fixed and semi-fixed expressions and idioms and occupy a crucial role in facilitating language production, being the key to fluency.’

‘An explanation for native speakers’ fluency is that vocabulary is not stored only as individual words, but also as parts of phrases and larger chunks, which can be retrieved from memory as a whole, reducing processing difficulties. On the other hand, learners who only learn individual words will need a lot more time and effort to express themselves.

During the course special emphasis was given to the selection and acquisition of set phrases that frequently occurred in texts, such as: *the graph suggests that*; or *as shown in the diagram*, etc. The ESP instructor did not advocate the parrot-learning of lexical phrases but saw no reason why she could not introduce a range of set phrases which could aid students as an option in expressing themselves. When students’ vocabulary is limited in certain situations, the lexical phrases may provide a quick road to proficiency.

An opinion-survey among the participants of the course revealed that introducing task-based assignments and creating games in pairs was both motivating and challenging and a welcome break from the usual routine.

Uberman (1998) also affirms the helpful role of games in vocabulary teaching after quoting and analyzing different opinions of experts. From her own teaching experiences, Uberman observed the enthusiasm of her students in learning through games. She considers games a way to help students not only enjoy and entertain with the language they learn, but also, coincidentally, practice it. Games are useful and effective tools that should be applied in vocabulary classes. The use of vocabulary is a way to make the lessons more interesting, enjoyable and effective.

5. Conclusions

The majority of students studying English language and literature find work in specialized fields. They are employed in vocational schools where they have to teach specialized vocabulary or become translators having to deal with special scientific/technical texts. Without the necessary basic background knowledge in a certain field, future teachers and translators find it extremely difficult to cope with the complex structures and terminology. The aim of the course introduced at the International University of Novi Pazar was to acquaint students, who had a fairly good background knowledge in linguistics but were non-specialists in a scientific or technological field, with basic scientific concepts and principles so that they understand what they read in scientific, medical and technical texts which they will have to deal with in the future as professional translators. It was expected that if students of English were acquainted with basic knowledge in science and technology, they would be able to make more appropriate choices when they came across terminological and noun and verb phrase problems in translation of LSP texts and would be able to convey the information contained therein more clearly and accurately. Students need to be technically literate in order to be able to make sense of science and technology texts. Despite their different approach to education and learning, and general high-school knowledge in most of the specialized fields, students of English found this course beneficial, though quite demanding. The LSP instructor encouraged the students to work independently, conduct their own search, look for explanations on the internet or seek help from professional experts.

Our experience has shown that in this course the combined method worked best: a linguist trained in scientific and technical terminology with a professional experience and some knowledge about particular fields of science and technology on one hand, and a professional expert (a subject specialist) preferably one who has a basic knowledge of the complexities of the translation process on the other. Students, the ESP teacher as well as the subject specialist have to cross the boundaries of their existing knowledge and move to a field of study which they may at times find unpleasant but challenging and rewarding.

The answers in the questionnaire conducted among students at the end of the course proved that the majority of participants thought this ESP course useful. Some students pointed out that the oral quiz did not help them. Despite their initial enthusiasm in creating the quiz questions for their peers, at the end of the course around 40% of participants felt the oral quiz was too demanding. They saw no point in having to learn the technical terms and definitions which was quite far from their scope of interest and often beyond their comprehension, though they admitted that memorizing frequent collocations might be help to them.

However, over 60% of the students said that the most effective phase of the vocabulary acquisition course was the consultation with the subject specialist, and the creation of the dictionary containing common words/phrases.

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Language Education

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Learning of the written system: The case of the competitive contexts

A INVENÇÃO DO CINTO¹

Chegar ao cinto
Foi simples.
Antes dele,
Muita gente sentava
E quando ia levantar
A calça caía.
“sinto muito,
Sinto muito”
É o que todos diziam.
Até que uma criatura
Inventou de botar
Uma corda na cintura
Daí em diante
Sempre que perguntavam
Por que sua calça
Não caía, ela respondia:
“muito cinto, muito cinto”.

1. Introduction

The poem above uses a play on words with the lexical items *cinto* and *sinto*² which have the same sounds. In the context, it is possible to perceive that there are distinct meanings for the terms applied, moreover, there are different forms of spelling them. This is a case of non-homograph homophones, the general subject of this article. The point of discussion, however, will be the case of the homophones that the written representation is of the phoneme /s/, as in the poem of Silvestrin (2004). For this, data

¹ THE INVENTION OF THE BELT/ To get to the belt/ It was simple./Before it, Many people seated/ And when they were going to get up/ The pants fell./ “I am sorry./ I am sorry”/ It is what all said./ Until a creature/ Though of putting/ A rope in the waist/ From then on/ Whenever one asked / Why his pants/ Did not fall./ he answered:/ “much belt, much belt”.

² Belt and feel.

were chosen from a deeper study carried out by Heinig (2003) with students from the fourth grade of an elementary school. Being with the students and the teacher in the classroom context allowed me to understand how the students learn and also to teach about the codification of the language and how easy or difficult it is to spell the words in a competitive context. Broadening the study to the macro space of the teachers' formation, the investigations of this nature are justified, considering that the teachers of elementary school rarely study the principles of the alphabetical system of Brazilian Portuguese, which leads to: the lack of comprehension as to how the teaching-learning of orthography happens; the didactic book is used as a base for the didactic material, in which the teaching takes place mechanically and using exercises which are out of context most of the time. These factors motivated the development of the research that investigate the access to orthographic lexical homonymy and to analyze how the practice in the classroom has been developing the codification process, specifically in competitive contexts.

2. Theoretical questions: two important aspects

2.1 *Homonymy as a problem of semantic confusion*

To establish the distinction between homonymy and polysemy, it is useful to refer to Moura's (2001) arguments, who presents the obligatoriness of determinations in the context for such criterion. From Pinkal (1995, p. 86), one knows that "an expression is a homonym if and only if an indeterminate level of base is inadmissible." Thus, applying the first criterion, when there are homonyms, one sole meaning is obligatory in a given context. Therefore, in a sentence in which it appears, for example, the item *bank*, there will be only one of the two possible meanings, that is, financial institution or a river bank. However, in the case of polysemy this does not occur, once it admits indefinite values of truth. That is, more than one meaning can co-occur for the same lexical item. For example, the words *book*, *letter* and *paperback* also discussed by Cruse (2000), can be interpreted as [text] as well as [volume].

It is exactly the criterion of obligatoriness of context determination, according to Moura (2001) that characterizes homonymy, opposed to polysemy and vagueness. This idea emerges applying the tests of ambiguity already considered by other authors (KEMPSON, 1980; CRUSE, 2000). The same is true with tests of identity and zeugma, which aim at comparing the incompatibility of different meanings in only one lexical item. Unlike what was considered by Moura, these tests grouped ambiguity in one side, covering homonymy and polysemy, and vagueness on the other. Thus, it is possible to see that the opposition between homonymy and polysemy occurs when "there is a complete incompatibility between the senses of a word, but in the case of polysemy such incompatibility can be bigger or smaller" (MOURA, 2001, p. 113-4).

Since the subject matter of this discussion is homonymy, this phenomenon can be understood as the relation that exists among different lexical items, with the same pronunciation and/or spelling, but two or more meanings. Therefore, it is possible

to find words which have the same pronunciation and spelling where context and, sometimes precision will be required, so that the adequate choice of the sense can be made.

It is also possible to find partial homonymy, that is, there is only the same pronunciation or spelling: which are the cases of homographs and homophones. In this situation, the attribution of the meaning can become simpler, especially, if, in the written medium, decoding is taken into account.

2.2 Competitive contexts: important aspects for the comprehension and didactic transposition

If reading, on one side, allows the subject to conquer the world of the written language, it is exactly in the very act of writing that this new statute happens completely. The writing issue, here, will focus on the ability to produce writing, specifically, as its learning occurs, considering activities such as dictation and spelling and their more frequent difficulties.

In a common situation of dictation, the starting point is to match the heard utterance with its orthographic representation. To arrive at the spelling, it is possible to go by the phonological route and/or the written lexical one. In the first one, it is possible to go after the phonological-graphemic correspondences; in the other, the direct recovery of the written form of the word is done from a phonologic equivalent form. The spelling of regular, unknown words and pseudo-words only occurs by the phonological route. But the written lexical route allows the correct spelling of the irregular words as it is necessary to recover the etymological fixed form from the mental lexicon, which was well represented in the double route model by Castro and Gomes (2000, p. 151).

The alphabetical system of Brazilian Portuguese is especially transparent, regarding reading, however, there are many situations in writing in which the phonemes-graphemes correspondences are irregular. This occurs in competitive contexts, in which the non-homographs homophones are included: it is possible, for example, to read “*sena*”³ as /‘sena/ considering the decoding rule according to which the “s” in initial position is read as /s/. Scliar-Cabral (2003a, p. 83) explains the D2.1 rule this way: “... the grapheme “s” is read as the transposition to pronounce the phoneme /s/, when it is found in the beginning of a word, as in “*sapo*”⁴... However, for coding the same phonological sequence above, the writer can do it either with the grapheme “s” or with “c” and the two orthographies would result in real words in Portuguese, the homophones “*sena*” (a piece of domino or face of dice having six pips or points) and *cena* (stage). The doubt here, for coding, only ends when the meaning of the word is recovered: that is why the editor needs the information given in the context to which the word belongs.

³ stage.

⁴ frog.

The competitive alternatives constitute the biggest orthographic difficulty in the learning of the written system. In cases such as the phoneme /s/ which shows the largest number of possible conversions, “it is necessary to select the item which matches semantically and morpho-syntactically the phonological form in the mental orthographic lexicon” (SCLIAR-CABRAL, 2003a, p. 151)⁵. Situations of this nature can be solved and understood if there is an intelligent grammar teaching that considers: 1) the role of meaning when two items belong to the same grammatical class; 2) the morphology, especially, derivation. So, the spelling of “*paço*” or “*passo*”, “*sessão*” or “*seção*”⁶, can only be decided in a context which the editor can attribute a sense to, since the phoneme /s/ in internal position before a posterior vowel may be coded into many different graphemes. The same occurs with “*sinto*” and “*cinto*”, the subject of the poem which began this article; however what needs to be observed in this case, is that the phoneme /s/ begins the word and the following vowel is not posterior.

Starting with this theoretical scene, the following is a synthesis of the research methodology and later a discussion about the collected data.

3. Methodology outlines

This research, aimed at evaluating the effect of the systematic education, opted for working with two groups of subjects, one the experimental group (EG) and the other control (CG). Because of this, the choice of the institution was fundamental and we selected a school located in Brusque, Brazil. At this school there were two classes in which the Portuguese Language was taught by the same teacher, so it was possible to analyze the teaching-learning process performed by the same teacher, but with different methodology. The sample consisted of two fourth grade classes with 25 students each, from the morning shift⁷. Initially the EG subjects answered a questionnaire that allowed to identify the profile of the participants both at home and in school. They are monolingual; the average age is 9 years and 8 months; the majority of the parents finished higher education; the majority of the students entered preschool when they were around 2 years old; the subjects use the dictionary more at home than at school; the majority did not know how to read and write when enrolled in the elementary school and started attending classes at the referred institution in the preschool.

This study is based on the data collected from these subjects. For this article, we selected data from the pre-test and post-test. The test applied to the subjects took the form of interactive dictation. The non-homograph homonyms were taken from the didactic book used in the school and dictated to the subjects who had to spell and justify their choice. Between the application of the two tests, a collaborative intervention was

⁵ Translate by the author of this article.

⁶ Palace; step; session and section.

⁷ In Brazil, the schools operate in three shifts: morning, afternoon and night.

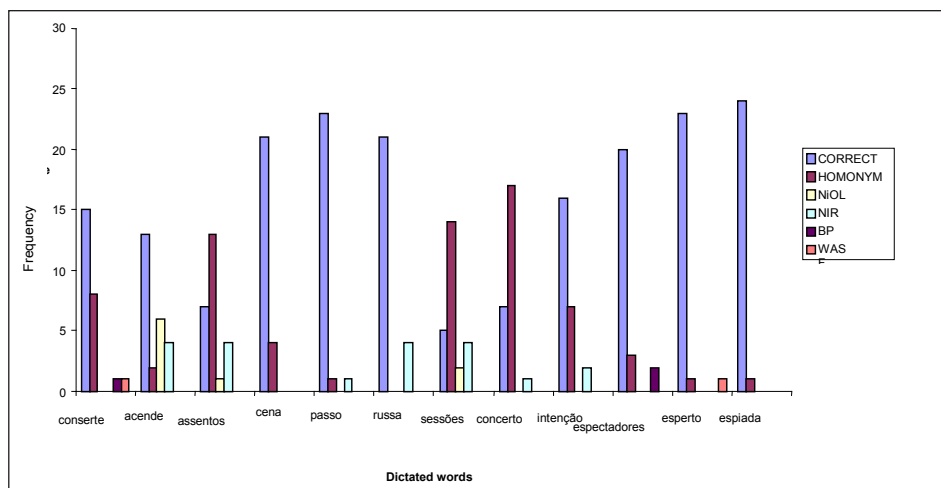
developed with the EG, for whom planning was carried out by the researcher and the teacher, but the application was done only by the teacher during a semester.

4. The spelling of the non-homograph homonyms and the pedagogic implications: some data

In this section, we will discuss the data and results from the pre and post-test taking into consideration, especially, the performance of the students concerning the way of spelling the non-homographs homophones.

Of the 20 lexical items chosen for the tests, 12 present doubt in the coding of the phoneme /s/, which are: *conserta*, *acende*, *assentos*, *cena*, *passo*, *rusa*, *sessões*, *concerto*, *intenção*, *espectadores*, *esperto*, *espiada*⁸. Table 1 discloses subjects' performance in the pre-test, on these words:

Table 1: Codification of /s/ in the pre-test by EG



As well as analyzing the number of correct spellings, the words dictated were also categorized according to the different ways of being spelled. The answers have been grouped in six categories:

- 1) correct: the subject spelled the word correctly;
- 2) homophones: the subject spelled the homophone of the word considering only the dictated sound;
- 3) NIOL (not internalized in the ortographic lexicon): the subject spelled the word in a form that does not exist in the Portuguese language: this is due to the lack of reading;

⁸ Fix, light, seats, scene, step, difficult, sessions, concert, intention, spectators, smart, glance.

- 4) NIR (not internalized rule): the subject spelled the word incorrectly for not knowing the coding rules;
- 5) BP (bigger problems): the subject spelled the word incorrectly showing perception or syntax problems;
- 6) WAS (writes as speaks): the subject spelled the word as he says it, showing no distinction between speaking and writing.

It is not possible to bring all the data to this article, but it is important to make a reference to other data organized in tables (HEINIG, 2003) that compare the number of correct spellings: specifically, it is possible to observe how the two groups are similar when the other categories are analyzed. The data show that more than a half of the answers, 60.8% in EG and 60.6% in the CG, belong to category 1. The words with the greater number of correct spellings (more than 20) were: *espiada*, *esperto*, *passo*, *rusa*, *cena* in both groups and *espectadores*⁹ with 20 right spellings in the EG.

The biggest difficulty is found in category 2, where the dictated word is testing in a competitive context. The homophones that appeared most times, in both groups, were: *acentos*, *sessões* and *concerto*¹⁰. The doubt between the non-homographs homophones points to the necessity of a work in classroom that helps the student to solve this type of doubt considering the context and/or the sense construction of the word.

On the other hand, the other categories appear in smaller number and can be understood if the beginning reading-writing process of these subjects is considered. The category 3 (NIOL) results from little reading, that is, the tested words are not part of the previous knowledge of the subjects or they are rarely found in texts. For example, the dictated word *despensa*¹¹ was written as *despença* and this spelling does not exist. The student spelled the word that way because: it is possible, therefore it is a competitive context, even though the word does not exist; the subject does not have the word “*despensa*” in his orthographic lexicon.

Category 4 (NIR) points to coding problems, especially to phonological-graphemic rules correspondence that still have not been studied by the students. As for Scliar-Cabral's tests on reception and production in the Brazilian Portuguese language, some problems were found which were related to the unfamiliarity of the coding rules, but they were not the same as those identified in the pre-test. In these tests, it was verified that the following rules had not been internalized: 1) “the coding of the phoneme /s/ can be rewritten as “ss”, “c”, or “sc” [...], between oral vowel and not posterior oral or nasal vowel, or not posterior semivowel,...” (SCLIA-CABRAL, 2003a, pp. 153-4), so, the subjects of both groups wrote: *asende*, *asentos*¹²; 2) “the coding of phoneme /s/ [...] between oral vowel and post oral or nasal vowel except for [+high], posterior, [...] can be written with the graphemes “ss”, “c” (*op. cit.*, p. 155).

⁹ glance, smart, step, difficult, scene and spectators.

¹⁰ accents, seats and concert.

¹¹ storeroom.

¹² light, seat.

Both groups are examples of the unfamiliarity with the rule: *paso, rusa, sessões, descrição*¹³. 3) “the coding of the phoneme /s/ in the initial position of a syllable, between nasal vowel and oral or nasal vowel or not posterior semivowel [...] can be rewritten “s”, “c” or “sc” (*op. cit.*, p. 156). In both groups, there was only the spelling *consserto*. 4) “the accomplishment of the phoneme /s/ can be coded either by grapheme “s” or “c” in beginning of syllable between nasal vowel and oral or nasal posterior vowel [...] or between /ẽ/ and the posterior semivowel /w/” (*op. cit.*, p. 156), as it did not happen in: *intenssão, dispensssa* and *despenssa*. It is interesting to observe that the phoneme which caused more problems, in this category, was /s/ exactly because its coding belongs to competitive contexts, which is one of the phonemes that presents the greatest difficulty for the learners of orthographic rules.

This diagnosis made possible the completion of the collaborative intervention that focused on all the dictated words in the pre-test as well as others that had been diagnosed in Scliar-Cabral’s tests on reception and production in the Brazilian Portuguese language (2003b), beyond doubts that appeared throughout the work in classroom. As the work was being developed, the students started inferring rules, analyzing contexts and constructing justifications. The work in the classroom happened in different ways, but it had as a starting point mainly the games prepared in CD-ROM and flashcards, and from them other activities were developed. That work carried out by the teacher in the classroom under the orientation of the researcher indicates that teaching the competitive contexts requires a professional who uses grammatical knowledge and meaning to help solving the learner’s doubts: this professional must understand what knowledge is necessary to make the right decision in each situation. In this bias, it is necessary to understand that the written lexical route allows writing the irregular words correctly once the orthographic form stored in the mental lexicon is recovered.

As previously stated, the alphabetical system of the Brazilian Portuguese is transparent in respect to reading, however, there are many situations, in writing, where the conversions phoneme-to-grapheme are irregular, being highlighted, particularly, the situations of the competitive contexts, in which the non-homographs homophones are included, where spelling depends on information from the text which shows it is either referring to the semantic or morphologic aspects.

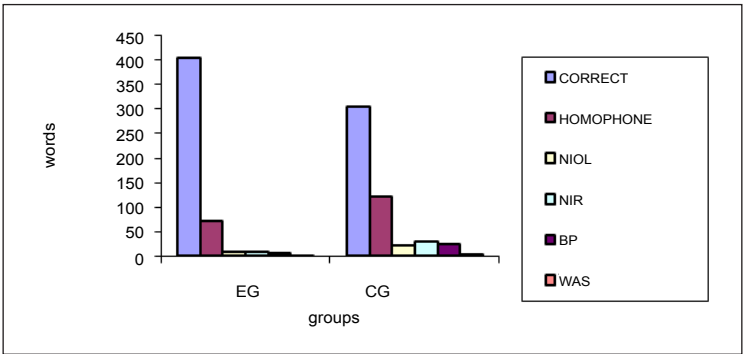
Moreover, it is necessary to consider that the learning of writing happens gradually, and when the child enters the school, he/she starts to establish the distinction between drawing and writing through the experiences developed there. At this moment, the child also starts to perceive that we do not write the way we speak, and it means that the speaking chain must be segmented and it will then start to be represented by discrete units separated by blank spaces. Therefore, the task of the learner of the written system involves a series of “abilities”, that is, he/she will have to be able of reflecting on the grammatical class of the word under analysis; be aware of the position of the

¹³ palace, difficult, session, description

sound segment in the word; observe the stress etc. This way, joining the information from those words with information from the context, teacher and students, will infer the rules that allow understanding the orthographic rules in an analytic process and not only learning by hart. Research in the area of Applied Psycholinguistics allows the understanding of the learning process of the alphabetical system, and also, from the obtained data, it is possible to present a methodology proposal that shows another way to understand the teaching and learning of coding.

As for the results, this article keeps only to the form as the words were written in the post-test, not presenting the results concerning to the way the subjects elaborated the justifications. Table 2 presents data that refer to the performance of the subjects of the EG after the collaborative intervention.

Table 2: Categories according to the way of spelling the dictated word in the post-test



Comparing the groups, it is possible to observe that there are differences in the number of answers in all the categories except in the last one. The data show that, in category 1, there is a difference between the two groups, therefore the EG had 81% of the answers and the CG 61%, being close to the result obtained in the pre-test which was 60,6%.

Differing from what happened in the pre-test, the groups also do not present similar behavior in relation to categories 2 (homophones), 3 (NIOL), 4 (NIR) and 5 (BP), even though the biggest difficulty in the two groups still lies in category 2.

As for the non-homograph homophones test competitive contexts, the subjects showed relative difficulty in spelling the dictated words adequately. In the EG, a significant improvement was observed in this aspect, as the indexes changed from 26,2% in the pre-test to 14,4% in the post-test, showing that the words that still present greatest difficulty for these subjects are *sessões/seções*¹⁴ and *conserto/concerto*¹⁵. As for

¹⁴ sessions/ sections.

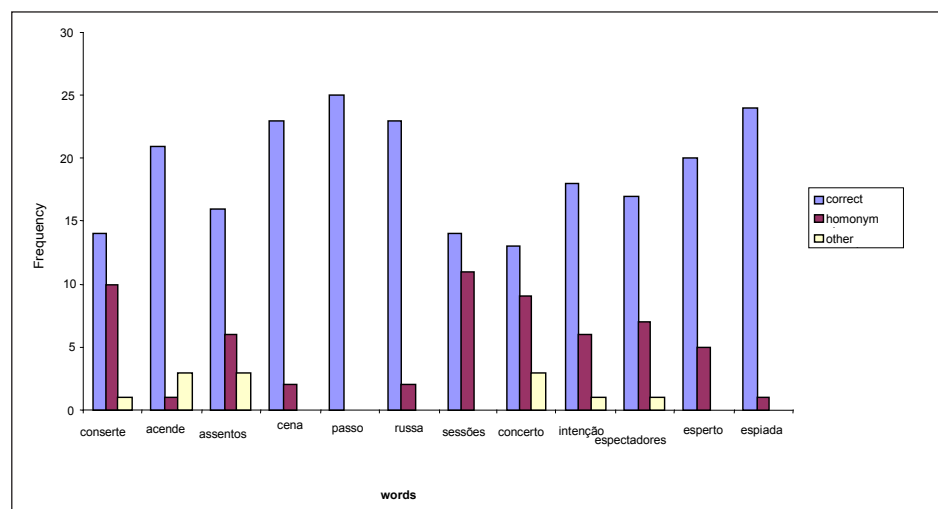
¹⁵ fix/ concert.

the competitive context /s/ the words with more than ten occurrences were: *concerte*, *acentos*¹⁶. The difference between the two groups in category 1 and 2 reveals that the work with the homophones non homographs was a factor that helped the students of the EG to perceive differences between one and another spelling, which became even clearer when the justifications were analyzed, so it is not only enough to know how to spell, it is also necessary to reflect on the factors that lead to an option of one or the other spelling.

Although this work has focused on the homophones non homographs, the results were noticeable in categories 3, 4 and 5, which remained similar in the CG, but had a fall in the EG.

Analyzing each one of the dictated words, in both groups, it was possible to perceive that, in the EG, the number of occurrences in category 1 (correct) increased and that the category 2 (homophone) was the one that suffered the greatest fall, however, in the CG, the situation remained practically the same. The following table shows in details the way of spelling the phoneme /s/ by the EG in competitive contexts:

Table 3: Codification of /s/ in the post-test by EG



In comparison to table 1, which analyzes the pre-test in this same situation, in the EG, it was verified that there was a reduction regarding the number of hypotheses of spelling for the same word dictated. In the pre-test, only one occurrence was

¹⁶ fix/accents.

computed in the correct category, but in the post-test there were three. Moreover, 16 words had the frequency increased in this category, two remained the same and only one had a fall: *conserte*.

These results are related to the work developed in the classroom from which I chose some aspects to be presented in the final section of this article.

5. Some conclusions

Regarding the work developed during the collaborative intervention, two aspects have turned out to be fundamental, and they are both linked: the planning and the methodology.

The systematic planning of the lexical items presented favored their understanding, because it was based on the development of the argument to explain the spelling of non-homograph homophone, considering, especially, the meaning. Therefore, a mechanical position where the student only repeats was discarded and he was induced into the position of someone who asks questions, therefore, only in reflecting on the language is it possible to decide on the linguistic ambiguities in a rational way. Thus, when the student is persuaded to analyze and discuss the non-homograph homophones, he learns to observe differences and similarities and to search for reasons to explain them. He also learns to produce coherent justifications and discuss with his peers, thus developing his capacity of argumentation.

For the planning a methodology was developed based on the activities that promoted reflection and discussion during the learning. As a result of the work performed, it was verified that:

1. The employed methodology favored the correct spelling, but especially the way of justifying when presenting the link, in the great majority of the cases, between the way of spelling and the justification, the results of the post-test have pointed to an increase from 89 to 329 answers with a link.
2. The majority of the justifications, after the collaborative intervention, is centered in the semantic knowledge.
3. Subjects from the EG not only internalized in their mental orthographic lexicon many of the homographs presented as well as their meanings, which made it possible for them to explain the different spellings.
4. Students from the EG with greater difficulties detected in the pre-test (25%) went from 10 words with the correct spelling to 17, which is extremely significant.
5. Teaching to think the reason why a homophone is spelled makes the reflection on other possible linguistic phenomena.
6. The ludic aspect favored the results achieved, moreover, it is possible to obtain results regarding the use of the game for the learning of the orthographic system, a scarcity pointed out by Curvelo, Meireles and Correa (1998).

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Mirroring as the greatest difficulty in letter recognition¹

1. Introduction

Morais (1997) highlights the contrast between the “irresistible force” of the oral language acquired by children with numerous types of cognitive pathology, and the “lamentable failures” in the learning of reading and writing by “clever, intelligent” children. “Recognizing these paradoxes is the best point of departure for effective reflection on the problems of learning to read and write”. (MORAIS, 1997, p. 44).

Pedagogical reflection is often blind to the paradoxes like those pointed out by the author, closing in on itself and resisting scientific advances that could be added to the existing theories in the attempt to change attitudes and find solutions to problems that are still perpetuated in the history of education, such as absolute and functional illiteracy. Nowadays, there is much discussion on the importance of teaching literacy and training proficient readers in a way that will guarantee, for these individuals, the social use of writing in day-to-day practices outside the school. However, there appears to be a lack of interest in the initial phase of the training process. A person who is learning to read, in order to become proficient, needs to move beyond the initial stages of literacy that involve recognizing the lines that distinguish the letters and the correspondences between the graphemes and phonemes, both with the function of distinguishing meanings; he or she also needs to make these skills automatic, in terms of the process of reception (decodification) and production (codification), in order to advance to levels of literacy that will actually enable him or her to appropriate the benefits to be derived from mastering the skills of reading and writing.

The taboo that still surrounds the discussions in this initial stage of learning to read and write has placed a heavy burden on learners, who are often expected to behave like mature readers. In order to enrich the theoretical bases that exist in the area of reading and literacy, particularly in relation to this initial phase of the literacy process, this article gives a brief presentation of the initial results of an investigation on mirroring for letter recognition. It is essentially based on the neuroscientific discoveries by Dehaene (2007), who affirms that the biological and cultural aspects that define us as human beings are far more overlapping than the dualist trends shown by some scientific studies. An investigation is proposed, based on a syllabary that was designed

¹ This article presents data relating to a study on neuronal recycling, which began at PhD level, under the supervision of Dr Emérita Leonor Scliar-Cabral (UFSC), based on contributions from Professor Dr. Régine Kolinsky (Université Libre de Bruxelles – ULB) and collaboration of Professor Dr. José Morais (ULB), Professor Dr. Paulo Ventura (Universidade de Lisboa – UL) and Professor Dr. Tânia Fernandes (UL).

based on the observation that mirrored graphemes present a higher level of difficulty than topologically similar graphemes, in the reading of a writing system.

2. Reading in its initial phase

At a time when education is available to all, illiteracy is being combated, and there is unrestricted access to literacy education and a teaching that values the learner in his or her totality, there appears to be a discrepancy between the goals of these efforts and their actual results. Is not reading, after all, as simple as many of the institutionalized discourses would have one believe?

The initial phase of reading takes place before the child starts school, as it is in the social environment that the child first comes across different literacy practices. According to Paulo Freire (1994, p. 15), “all reading of the word presupposes a previous reading of the world, and all reading of the word involves reading the world, in such a way that reading the world and reading the word become a single, continuous in which you come and go”. This phase, which takes place before formal contact with the written word, cannot be ignored, but given that this work deals with reading from a cognitive perspective, the initial phase is taken as that in which the formal leaning of the system of writing and language begins. This phase involves recognition of the graphic symbols (graphemes) that make up the system, in order to establish their relations with the phonemes of the language, so that it will be possible, in the future, to reach more complex levels of understanding, interpretation, resignification, etc.

There is no doubt that when it comes to reading, the aim is that the readers will reach more advanced levels. These levels become the pinnacle of all the efforts that have been made, over time, in the teaching of literacy. It is known, however, that many readers do not manage to achieve these advanced levels, for different reasons, even though one could reasonably hope that they would do so after eight years of schooling, during which (one presumes) they had daily contact with reading.

Can this failure to learn to read be attributed to the fact that in many cases, those who train educators have not fully understood the proposals of literacy that have been widely publicized in the recent decades? Could the results observed – in a time when technological and scientific advances are creating ever more discomfort for those who are unsuccessful in an activity that is so essential in today’s literacy - centered culture – be an indication that the problem does not lie in the lack of understanding of the theories, but in the theories themselves? There appears to be some truth in both cases.

On one hand, the educational theories proposed in recent decades point to unparalleled advances, particularly in relation to the historical, social and cultural concept of mankind, and his relationship with others and with his environment. This new understanding of the relationship between the educator and the educated, of the meanings developed in the school, and of the pedagogical praxis and the

dialectic construction of knowledge, has moved away from the former concepts of teaching and learning that were mechanistic, decontextualized and unrelated to the social life. And in this sense, the fact that these concepts have still not been understood by the teaching profession involves a certain loss for the educational process.

On the other hand, perhaps the zeal with which these new concepts have been taken on board in educational circles in recent decades has had consequences that are no less alarming than the previous ones: the abandonment of educational practices that were heavily criticized, for a number of valid reasons, has led to a failure to consider extremely healthy aspects of the educational process. As Nunes and Kramer (1994) state, in a metaphor that is widely used in educational circles, the baby has been thrown out with the bathwater (!). While teachers learned what was inappropriate in the teaching and learning process, this did not mean they were clear as to what exactly they should do about it.

And when it comes to literacy, in its initial phase of systematized contact with the world of the written text, the problems were even more exacerbated. The old primers were criticized – and the discussion appears to be far from over – but faced with the new pedagogical trends from the whole theoretical construct brought by Piaget, Ferreiro, Vygotsky and others, and often, the insecurity over what to “put in the place” of the existing practices, teachers resorted to continuing with the former criticized practices, in an attitude that was, at the very least, dissonant and contradictory.

The intention here is not to deny or detract from the value of all the concepts of education that have been constructed in recent decades, through the efforts of many educators who are fully committed to education in different aspects. After all, by valorizing the subject as a social and historical being and reviving the function of the school, education has begun to carve out its path, showing signs of a better future and of climbing back from the long period of lethargy in which it found itself.

The constructivist trends, however, defend the attitude of an experienced reader, for whom the process of decodification has already become automatic. And expecting a learner, who still has not mastered the written code, to behave like a mature reader is, at the very least, unproductive. The result is reflected in the dramatic results of the assessments. The students neither decodify nor guess. They simply simulate reading, feeling increasingly insecure and frustrated, and end up with a dislike of reading. Humanity took a long time to elaborate the systems of writing that exist today. Despite the phylogenetic and psychogenetic approaches to the development of writing, widely publicized in educational circles, in school, according to Kato (1998, p. 32), “[...] one does not expect the learner to develop gradually, but to behave like a fully literate person, right from the start of the literacy process”.

Kato (1998) warns of the danger of taking as a point of departure the ideal reader, as this means committing the “grave error of assuming that it is possible to teach a child the strategies of a mature reader”, affirming that educators

[...] appear to believe that it is possible to avoid, at the start of literacy, separating the act of reading and writing words, and the text, which would be its natural place. But it should be remembered that in fact, this separation is linked to a stage of literacy that is characterized by a metalinguistic awareness of the word not only as an autonomous unit, but as a component of the text. The awareness of this unit causes the child to focus on this object, temporarily removing it from its context, which he recovers with greater or lesser speed. (KATO, 1998, pp. 32-33).

Mary Kato was ten years ahead of the recent discoveries that confirm the existing problem of not making viable for the child in the initial stage of literacy this necessary and temporary isolation of the object of study from its natural context.

According to Dehaene (2007, p. 290), although there is often a discrepancy between the research carried out and actual practice in the classroom, the experiments described in the author's most recent work confirm that: in reading, "the brain does not move directly from the image to the meaning". The currently accepted educational theoretical premises, which attempt to revive only the historical and social dimension of the human being, end up denying his biological dimension, and often go against many scientific advances relating to man's biopsychological make up.

Writing systems, which vary from the written representation of meanings (as in Chinese writing) to the representation of phonemes (as in neo-latin languages), reflect the so-called two-way route of reading. On one hand, reading follows a phonological route, and on the other, it follows a lexical route. When reading, in the case of inexperienced readers, like children in the initial phase of literacy, their ability to coordinate the two seems unstable. It is only with experience that the two become integrated, to the point where they merge into "a single, integrated reading system", as Dehaene states (2007, p. 71).

Without our even realizing it, a whole series of cerebral and mental operations is unleashed before a word is even decoded. It is dissected, then recomposed in the form of letters, bigrams, syllables, morphemes [...]

The target of literacy education is clear, then: it is necessary to position this hierarchy in the brain, so that the child is able to recognize the letters and graphemes and transform them easily into acoustic images. All the other essential aspects of writing – learning to spell, enriching the vocabulary, shades of meaning, pleasure of style – directly depend on this ability. (DEHAENE, 2007, pp. 290-291).²

It is clear, then, that failing to take into consideration the hierarchy of these cerebral operations is doing a disservice to the learner. If the aim is to show the

² "À notre insu, toute une série d'opérations cérébrales et mentales s'enchaînent avant qu'un mot ne soit décodé. Celui-ci est disséqué, puis recomposé en lettres, bigrammes, syllabes, morphèmes... [...] Le but de l'enseignement de la lecture est donc clair : il faut mettre en place cette hiérarchie dans le cerveau, afin que l'enfant puisse reconnaître les lettres et les graphèmes et les transformer aisément en sons du langage. Tous les autres aspects essentiels de l'écrit – apprentissage de l'orthographe, enrichissement du vocabulaire, nuances de sens, plaisir du style – en dépendent directement.

reader the pleasures of reading and its benefits, the initial stages of letter recognition – decodification and codification – are the “key” to reading success, and it is necessary to provide the reader with this key. To use an analogy that is appropriate for the cyberculture in which humanity now lives, it is not feasible to expect somebody to navigate independently through cyberspace without first learning how to handle the peripherals that are essential for this activity – e.g. the mouse and keyboard – and be able to recognize the different icons shown on the monitor, so that, based on this recognition, he is able to understand what they mean in each context.

3. The hypothesis of neuronal recycling

According to Gibson *et al.* (1963), the distinctive features of the letters are first learned by the ability to distinguish objects, which is then transferred to writing, and from there it is a continual process, albeit slower with non-distinctive features between the letters. Currently, however, studies show that differences related to orientational aspects, specifically mirroring, are more difficult to learn, due to the way the neuronal system is organized.

Illiterate adults have not mastered the discrimination between mirrored figures. In a “same-different” decision making task, these subjects have difficulty taking into account the visual indices relating to right-left orientation. From a functional point of view, the orientation of objects is not as relevant as their shape, i.e. a chair turned to one side remains the same when turned to the other side. (VERHAEGHE; KOLINSKY, 1991, p. 60).

The example of the chair used by Verhaeghe and Kolinsky (1991), clearly illustrates the paradox faced by the literacy student when he comes across the need to distinguish graphemes which are rotated, or mirrored. The brain is organized in such a way that it symmetrically interprets the information it receives, which causes humans to recognize themselves when looking in a mirror, for example. In reading, this orientational difference, generally irrelevant in daily life, becomes significant in many cases, requiring the learner to perform a neuronal reconversion, which Dehaene (2007) calls “recycling”.

As Scliar-Cabral (2008) states, the lower the level of processing, the more automatic it should be during the learning, and the lower the number of features and units that make up the paradigm will be. This occurs so that the memory does not become overloaded, which is undesirable. An example of this is Chinese writing system; due to its mixed organization, with graphemes that correspond to morphemes and others that signal the pronunciation and ideographical units (although smaller in number), it has a very high number of possible combinations, making it highly complex (BOLTZ, 1996; TAYLOR, 1995).

Initially termed “neuronal reconversion” (DEHAENE, 2003), the hypothesis of neuronal recycling is based on the fact that the architecture of our brain, and our

genetic envelope, limits the set of learnable, cultural objects, as for instance, the case of variations in writing systems between different cultures. Previously, it was believed that recognition of the Chinese writing system occurred in global fashion, with greater activation of the right hemisphere – responsible for holistic processing – as opposed to reading alphabetic systems, where there is greater activation of the left hemisphere. It was believed that cultural differences, therefore, would lead to the use of different brain circuits for reading, a hypothesis that was refuted by Dehaene (2005; 2007), who demonstrated that readers of both systems use the same brain circuit, involving the so-called region of the visual form of the word – the left ventral occipitotemporal region – in the left hemisphere, regardless of the cerebral lateral preference between right and left handed individuals, since all written forms share different features that reflect these restrictions of the visual circuits.

The brain is organized to interpret the information it receives in symmetrical form. Thus, when we look at a mirror, we recognize ourselves, despite the orientational difference, as mentioned above, and we are able to recognize, in the majority of day-to-day situations, that an object is the same regardless of its position: a cup is still a cup, whether its handle is turned to the left or to the right, for example. In relation to reading, this characteristic should be interpreted differently. It is in this aspect that the neurones need to recycle themselves, as what they have “learned” is of no use in this case. They will need to “relearn” to interpret the data they receive.

Since we are born, we go through a series of transformations, until the central nervous system is ready to be able to read, even though from the first months the child demonstrates some skills for linguistic analysis. During the first year of life, the maternal language has a strong influence on the specialization of the cerebral areas involved in language. At around five or six years of age, when the child begins learning to read, the more significant process of visual recognition and invariance are established. “It is likely that the ventral visual system is still in a period of intense plasticity when the functional specialization is far from being established [...]”. This period, according to Dehaene (2007, p. 265), is extremely favorable for the appropriation of “new visual objects” like letters.

Dehaene (2007, p. 200) understands neuronal recycling as “[...] the partial or total invasion of cortical territories initially assigned to a different function, by a new cultural object”³. And this new cultural object is understood by the author, both in relation to the evolution of the species and in present-day terms. In relation to evolution, because there has been a change of specialization in the left ventral occipitotemporal region, previously focused on hunting and survival and now on reading. In present-day terms, because for the purposes of reading, the subject needs to recycle his neurons in order to relearn what is or is not relevant in reading, as is the case with mirroring letters, unlike what occurs in other day-to-day instances.

³ Translation by Scliar-Cabral (2008, not published) from the original: “[...] l’a invasion partielle ou totale, par un objet culturel nouveau, de territoires corticaux initialement dévolus à une fonction différente”.

The difficulty in learning something is directly related to the lesser or greater degree of difficulty in performing this recycling. In the case of the initial stage of reading, this difficulty is related, to some extent, to when the learner has to distinguish mirrored letters; there is a tendency for the left ventral occipitotemporal region to calculate an “invariance of rotation”, as Dehaene states (2003), which is useful in day-to-day life, but which ends up causing problems in reading. This does not happen in other situations where it is necessary to distinguish between similar, non-mirrored letters.

As soon as a child has contact with the writing system, at the start of the process of becoming familiar with the letters of the system, it is common for him to go through a period known as the “mirroring stage”⁴, in which it is very common to demonstrate a mirrored production of letters and/or words, as well as being unaware that the written production is inverted. In reading it is common, due to a result of this lack of awareness in relation to mirroring, for the child to invert mirrored letters. In so doing, the child is applying the symmetrization that is so useful to him in other instances of his life, like when he/ looks at himself in the mirror or recognizes objects in the world, even when they are in different positions. The subject, when dealt with in the literature, is done so in a very polemic way. Zorzi (2003, p. 132) comments that the problem behind the different points of view is related to “a lack of reliable, systematic information in relation to mirroring and its evolution in the process of children’s learning, although there have been many publications in this regard”. The author demonstrates the tendency to transform the phenomenon of mirroring into a pathology, such that it is frequently attributed to cases of dyslexia.

For Dehaene (2007), the stage of mirroring letters which, according to different studies, is normally transitory and is generally manifested in the first year of learning to read and write, is solid evidence in favor of the hypothesis of neuronal recycling. According to the author, mirrored writing reveals the obedience to the structural limitations imposed by evolution, which leads to symmetrization of the objects viewed. This characteristic is more specific than the identification of objects that occupy different spaces, or appear in one position or another (like a chair turned to the left, to the right, or even upside down, as mentioned by Verhaeghe and Kolinsky, 1991). It directly involves the question of change around one’s own vertical axis: the mirroring of the self. Thus, even though the visual system is favourable for reading, in the words of Dehaene (2007, p. 346), “Symmetry, on the contrary, is a property that compromises reading”⁵.

Thus, learning to read involves “unlearning” this general law of symmetry imposed by evolution. And it is with this dessymmetrization in mind that one should think of the process of teaching and learning the writing system, in the initial phase of literacy, when learners are experiencing difficulties involving letter recognition.

⁴ Dehaene (2007) calls it the “*stade du miroir*”.

⁵ Translation by the researcher, from the original: “La symétrie, en revanche, est une propriété qui gêne la lecture.”

4. The methodological construct of the research

The purpose of this research, which is based on Dehaene's (2007) theory of neuronal recycling, is to investigate how the desymmetrization of graphemes occurs in the initial phase of reading, and whether mirroring presents greater difficulty than graphic similarity by topological variation of the graphemes.

The research subjects belonged to two categories: adult, illiterate subjects and pre-literate children. Distributed into three groups (G1, G2 and G3), the subjects were submitted to sessions of learning a writing system comprised of twelve graphemes corresponding to syllables (syllabary), developed specially for the research.

Based on the observation that an alphabetical system is more complex, in relation to reading, than a syllabary one, as the grapheme component corresponds to abstract units of language – phonemes – a syllabary was designed for the proposed investigation. i.e. a system in which the grapheme components correspond to syllabic units.

The subjects were divided into three research groups, in order to control the main variable: the mirroring of graphemes. The system of G1 consists of six pairs of mirrored graphemes. The system of G3 consists of six pairs of topologically similar graphemes, i.e. with small alterations in their features. The system of G2 is mixed, consisting of three mirrored pairs and three topologically similar pairs. According to the hypothesis of neuronal recycling and the necessary desymmetrization in reading, when dealing with mirrored graphemes, it was expected that the G1 subjects would perform worse in the evaluating tests relating to the learning period of the syllabary than those of the G3, while the subjects of G2 would show an intermediary performance in reading the system.

The syllabary used in this research therefore consisted of eighteen symbols distributed in three separate systems, each containing twelve graphemes, as shown in the figure below:

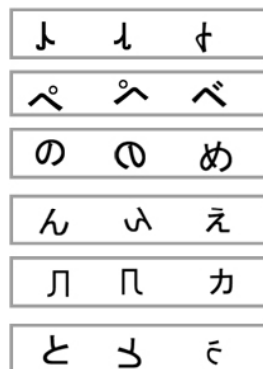


Figure 1: Grapheme constituents of the syllabary

Source: Garcia (2008).

Of the twelve graphemes of each of the three systems designed, six are root symbols (first column of the figure), which are repeated in the three systems, and on which the variations of the other six symbols are based. The first system (defined to be used with G1) consists of six mirrored pairs, based on the combination of root symbols and symbols in the second column. The third system (defined to be used with G3) consists of six pairs of symbols which have been topologically altered, produced based on the six root symbols and the six symbols in the third column, similar to them, with the addition of features and/or alterations to the relationships between the pairs. The second system (defined to be used with G2) is mixed, containing the root symbols associated with two types of combination: three mirrored symbols (second column) and three symbols with topological alterations (third column).

The definition of the sonorous counterparts of the twelve graphemes of each system was done in order to meet certain criteria, the main one being to control the number of repetitions of each syllable in the set of words formed and of the activities proposed during the learning sessions, to guarantee that each grapheme was presented to the subjects the same number of times. It was not intended that the selected syllables should form words in themselves, and a system of syllables in CV structure was sought (the canonic standard of Brazilian Portuguese). The formation of nouns and frequently used words in the lexicon of the research population was also an important criterion, even though it was not possible to achieve this for all the words formed, due to the natural limitations imposed by the number of syllables in Portuguese, and their characteristics in word formation. Thus, the following set of syllables was chosen: /ma, gu, ga, lu, ra, sa, pĩ, ba, fũ, ju, mo, ru/..

Using the set of syllables selected, it was possible to form 28 words and 18 pseudowords. The words formed were: *pingo, galho, barra, sarro, moça, fungo, malho, gago, molho, funcho, ralho, fuma, mocho, marra, barro, funga, morra, churro, pinça, macho, bago, pinga, pimba, russa, raça, baixo, mago* and *morro*. Some words were used in the learning sessions and in the evaluations; others were used only in the evaluations. The pseudowords, in turn, were defined exclusively for use in the evaluations, to ensure that the subjects were not using purely mnemonic strategies when reading. They are: *balho, chuma, fumba, chuga, pimo, gaça, gulho, moga, marro, mogo, pima, rago, funro, saba, pinra, rulho, funça* and *churra*.

The research design was defined so that all the subjects are submitted to four separate research stages: Pre-testing, learning sessions, intermediary testing and post-testing. All the stages are applied on an individual basis, over a period of three or four weeks, with one or two weeks for the pre-testing and two weeks for the learning sessions. Each session lasts between 30 minutes and two hours, with a total of approximately 14 hours of research with each subject.

The pre-testing phase has three to four sessions over one or two weeks, in which 12 tests are applied. Some of the tests actually consist of batteries of tests aimed at evaluating whether the subject is fit to take part in the research, as well as investigating data that enables them to be assigned to one of the three groups by means of an equalization by comparison of pairs. Others sought to cross different data with the

learning of the syllabary, such as the possible development of phonological skills as a result of the learning, change of visual processing – from holistic to analytical – and a possible generalization of the dissimilization in the recognition of the letters of the Roman alphabet system and geometric figures. The batteries of tests applied are presented below. The data resulting from their applications can be seen in Garcia (2008):

- a) Mini-mental state;
- b) Laterality test;
- c) Snellen test for visual acuity;
- d) Scliar-Cabral auditory discrimination test;
- e) Test of reading letters, words and pseudowords;
- f) Stroop test for reading interference;
- g) Syllable and phoneme skills test;
- h) Cooper test of processing visual forms;
- i) Luminance test;
- j) Image discrimination test;
- k) Wechsler visual memory and digit span test; and
- l) Ravens' colored progressive matrices test (RCPM).

In the learning phase of the syllabary, the subjects were submitted to six sessions over the two weeks, with the objective that they learn to relate the graphemes of the syllabary to their respective syllabary counterparts, based on the formation of at least twelve different words. The research predicts that the subjects will not be able to fully learn the relationships between the graphemes and their sonorous counterparts, but it is hoped that some level of learning will be achieved that will enable some evaluation of what is the difficulty in recognizing the different graphemes.

The intermediary testing was built into the research design to enable the learning development to be evaluated. Despite making the batteries of tests even more extensive, it seeks to give the investigation greater accuracy with regard to the development of the learning and the difficulties experienced by each group. The intermediary testing consists of the application of three tests: The test of learning the syllabary – the main test of the research – and two already applied in the pre-testing stage: The image discrimination test, and the luminance test, which seek to cross with the learning of other skills, as mentioned above.

The post-testing has the objective of making it possible to check the data obtained before and after the syllabary learning period, as well as the final data with the intermediary tests, enabling the development of the learning process of the subjects and of the different research groups to be outlined. All the tests carried out in the post-testing are known to the subjects, and are applied in the following order:

- a) Syllabary learning test;
- b) Image discrimination test;
- c) Luminance test;
- d) Cooper's visual forms processing test;
- e) Syllable and phoneme skills test.

The methodological research construct engendered was inspired by the project carried out by Kolinsky, of the Brussels Free University (ULB), which contributes to the definition of symbols of the syllabary, the research design, and the selection of the batteries of tests, some of which were adapted to computerized versions, using the program E-prime, by Ventura and collaborators of Lisbon University (UL). The complexity of the investigation led to our splitting the research into two separate periods. The objective of the first section, already concluded, was to determine the feasibility of the methodological proposal for the investigation, which was confirmed, after making some minor adjustments. The data presented in this article relate to this first period, in which the research was applied to nine subjects; five adults and four children. Based on the results obtained, the second phase of the research could then be initiated. Now in the execution phase, its aim is to collect statistically significant data regarding the hypothesis of neuronal recycling and the observation of mirroring with greater difficulty in the recognition of the letters.

5. The results obtained so far

The qualitative analysis of the data obtained so far points to a high level of difficulty in desymmetrizing in order to recognize the difference between mirrored graphemes in the initial phase of reading the syllabary, although the difficulty in identifying symbols which are topologically similar is also high.

Besides obtaining high success rates in the syllabary learning test, the research expects, among the difficulties found, to analyze which group presents a more concentrated level of errors in the identification of the graphemes: the group that had contact with a system of mirrored pairs, or the one that had contact with a system of topologically similar pairs. It would also be appropriate to analyze the occurrence of any advances in relation to the results of the intermediary and post-testing.

The results of the syllabary learning subtests show that the subjects of G1 (mirrored pairs) present higher levels of confusion between the pairs of graphemes studied than the subjects of G3 (topologically similar pairs), which confirms the hypothesis of neuronal recycling. The confusions experienced by the subjects of G3, however, were also high, which indicates that learning the system occurred at a basic level, preventing the desymmetrization from being analyzed at a deeper level, as would be desired. In the stage of the research described, there were no subjects distributed in G2.

Although the subjects had difficulty reading the words and pseudowords, tending to identify more the syllables in isolation, the subjects of G1 presented more concentrated errors, involving mirrored pairs, while the subjects of G3 presented errors involving topologically similar pairs, and also totally distinct pairs, to a much higher degree than the subjects of G1.⁶

⁶ The detailed results of each test applied to one of the research groups can be seen in Garcia (2008).

The data indicate that a system made up solely of topologically similar graphemes is more complex to learn, causing learners to commit more errors of confusion between the different graphemes of the system. On the other hand, the system made up of mirrored pairs proves less complex to learn, with the errors of confusion tending to be concentrated between the pairs with orientational difference, and not as widespread among the topologically distinct graphemes. In other words, even though the levels of errors are high in the different groups – which shows that the learning of both systems occurred at a primary level – the errors in G1 are more concentrated between the mirrored pairs, while in the G3 they were spread more between the different graphemes of the system, and not only between the topologically similar pairs. This data contradicts the statement of Dehaene (2007, p. 346) that symmetry is “a property that compromises reading”.

In fact, the subjects of G1 need to familiarize themselves with a set of just six different graphical configurations and their mirrored counterparts. The subjects of G3, in turn, need to familiarize themselves with a set of twelve different graphical configurations, even though there were minimal distinctions for the different pairs. It can be inferred that once the symmetrization barrier has been broken, the subject needs to recognize a relatively smaller number of graphemes in the system of the G1 than in the G3. This optimization of the systems comprised of mirrored graphemes explains that the errors are restricted more to the mirrored pairs in the G1 – with the system containing a smaller graphical variation – and tend to be spread among the different symbols in the G3 system, in which there is greater graphical variation. The subjects of G3 who still have not sufficiently learned the relationships between the graphemes and syllables, are confused between the topologically similar pairs and the total different symbols.

Obviously, these data need to be corroborated with a larger population to confirm this conclusion, but we take the liberty of stating, by way of a research proposal, that if, as Dehaene (2007) affirms, the neurological system imposes a difficulty for grapheme recognition, due to the tendency to symmetrize, then the writing systems, made up of some mirrored symbols, prove to be intelligently constructed in such a way as to facilitate their learning, when the barrier of symmetrization is overcome, as they prevent the memory from becoming overloaded with too much separate, visual information.

6. Final considerations

The hypothesis of neuronal recycling presented by Dehaene (2007) is highly relevant in education, as it leads to a reconsideration of literacy teaching practices in the initial phase of literacy, seeking to strengthen the relationship between the knowledge built in different areas in order to improve the quality of education and combat the high levels of illiteracy that still exist. Given that it is still recent, it lacks empirical research on teaching and learning that reflect on how to achieve the so-desired strengthening of the relationship between scientific practice and teaching practice, which justifies the research proposal described in this work.

As Rubem Alves (2004, p. 59) affirms, the objective is to reach the point of being able to say: “That which one day I did not know was taught to me; I learned with my body and forgot with my head. And the condition for which my hands know well is that the head does not think of what they are doing.” In fact, the philosopher goes on to say, a pianist who needs to think about the keys on which he is placing his fingers when playing a piece of music will “stumble disastrously”. (ALVES, 2004, p. 60). It is necessary to overcome these “stumbles” on the winding route, in the search for emancipation through literacy. And they need to be overcome not only by the future reader, but perhaps, in particular, by those who assume the role of showing the path we should follow. Thus, perhaps the first step free of stumbling is to think of the human being in his totality, i.e. as a biological being; as man is a social, historical and cultural being, then this is done out of a body that imposes certain limits and determined structures which, in turn, need to be respected, in order to make good use of them for the purpose of learning.

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Multilingualism / Bilingualism

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Phonetic-phonological transfer in multilingualism: A case study

1. Introduction

With the growth of world policies aimed at fostering multilingual teaching and learning, as currently observed in the European scene, the need to develop studies that investigate the transfer processes multilingual speakers go through when they are in contact with several linguistic systems is constantly increasing. In this context, the present article aims to present a case study that investigated the process of phonetic-phonological transfer involving vowel assimilation in the oral productions of a Brazilian adult speaker of Portuguese (L1), French (L2), and English (L3). The data obtained from the recordings of naming tasks in the three languages spoken by the subject were analyzed by using the *Praat* (version 4.4.2.2) software, which provided the acoustic measures (F1, F2 and duration) of the vowels.

2. L3 acquisition

Transfer is the key mechanism for cellular communication and it underlies any kind of learning through the application of prior knowledge to new learning situations. According to MacWhinney (2007), L1 and L2 are grounded on the same underlying neural architecture, so transfer is expected as a result of cell information transfer, input quantity and quality, and L1, L2 and L3 typological distance. One of the first studies in the L3 acquisition field was the one carried out by Ringbom (1987), who observed a Finnish group, speakers of Swedish as a second language, learning English as a third language. The group showed a relevant preference in tending to the Swedish language (L2), not to Finnish (L1), while producing the discourse in English. Ringbom claimed there was a need to expand the focus of L2 research to investigate the influence of languages other than the first one on the learning of a third language. After further inquiry into L3 learning, there is a growing body of evidence that L2 influences upon L3 learning. Therefore, it is now possible to account for some of the factors that seem to cause inter-linguistic transfer from the L2 to the L3.

The first factor is considered to be decisive in L2-L3 transfer: it is the typological distance observed between the two nonnative languages (HAMMARBERG, 2001; CENOZ, 2000). According to Cenoz (*op. cit.*), this factor can determine the choice of an L2 as the main source of influence in L3 learning. Then, the L2 influence will be stronger if it is typologically closer to the L3 than it is to the L1. Kellerman (1983) was one of the first scholars to highlight the role of typological distance as a relevant factor for the L2-L3 transfer. His approach, called “psychotypology”, emphasized the learner’s role in the identification of the typological distance between the languages. According to the author, the learner’s perception frequently does not correspond to the real typological distance. Thus, the emergence of a psychotypological perception is considered to be a product of both the learner’s metacognitive competence and metalinguistic consciousness. Sikogukira (1993) claims that the learning environment may be related to the “psychological similarity” effect assigned by the learner to the two languages. According to the author, this happens because if two languages are learned in the same fashion, in similar situations and under similar methodologies, they will noticeably influence each other.

A second aspect which may lead to L2-L3 transfer is the learner’s proficiency level in his/her L2. According to Hammarberg (*op.cit.*), a higher level in L2 proficiency may favor the influence of this second language over the third language, especially if the learner has acquired and used it in a natural environment, and not in a formal learning context. Nevertheless, as the proficiency level becomes higher, the learner does not need to resort to his/her second language to perform his or her communicative tasks in the L3.

The recency effect is also quoted as a relevant aspect in the L2-L3 transfer. Hammarberg (*op.cit.*) states that the L2 influence is more noticeable in the L3 production if the L2 has recently been used. Since the L2 receives a great demand in activation as it is developing, it turns out to be more accessible to the L3 learner. The recency usage effect, according to the author, can be propitiated by any contact with the L2, evidenced in perception or production.

3. The *HipCort* model and interlinguistic transfer

Connectionism assigns a relevant role to previous knowledge and experience in building new linguistic representations. The key assumption of connectionism regarding L2 acquisition is entrenchment, that is, the neural commitment of certain brain memory systems to L1 input, coupled by brain plasticity and L1 and L2 quantity and quality of input. The *HipCort* model (McCLELLAND *et al.*, 1995) postulates the complementarity between the hippocampal and the neocortical systems, which are responsible for memory and learning. According to the authors, when individuals are exposed to a certain experience, this experience is represented through the co-joint action of two memory systems. First, new learning is processed by synapses changes in the hippocampal system, which is specialized in rapid learning; then, such synapses

can be gradually reinstated in the neo-cortex, which is the other learning system accounting for slow and gradual learning. It means that initially, new learning occurs mainly in the hippocampus. The neo-cortex also participates in learning by working slowly to discover the structure in ensembles of experiences, that is, it provides support for items that are already associated in the pre-existing knowledge.

Hence, the HipCort model postulates that learning and memory are formed from substantial changes in the weights of the connections among the hippocampal system. This system is extremely fast and has a practically instant learning mechanism. For this reason, the information is carried both from the hippocampal to the neocortical system, as from the neocortical to the hippocampal, through bidirectional connections of the activity patterns from one system to the other. In short, new learning seems to have a very slow and gradual consolidation mechanism. To establish the learning of an experience and the creation of a memory, this experience has to be overplayed to the hippocampal system repeated times, and this exposure provides small readjustments to the connection weights. Therefore, a trace of memory will be generated, suitable to being explicitly reactivated by the relocation of the hippocampal and neocortical synapses (McCLELLAND *et al.*, 1995).

It is possible to explain interlinguistic transfer based on the way the two memory systems interact. This kind of transfer may occur when the learner's previous knowledge, such as the L1 linguistic knowledge, differs from – or is very similar to – the newly presented L2 patterns which are being acquired. Thus, the L1 patterns, more deeply entrenched in the neocortex, compete with peculiar patterns present in the L2 input, since the former have been consolidated for a longer time in the learner's long term memory system. Therefore, in a connectionist perspective on transfer, one can state that while L2 learning departs from previous experience with one's L1, which is entrenched in neocortical memory structures, L3 learners use their L2 experience to augment their capacity to counteract L1 entrenchment, mainly in the field of oral production (ZIMMER *et al.*, 2009). Therefore, in this study the notions of interlanguage and entrenchment are intertwined and related to the micro and macrostructure of cognition, so that L2-L3 phonological transfer is seen as the entrenchment of phonetic-phonological knowledge stemming from one's L1 and L2 input in both cooperative and competitive activations.

4. Vowel assimilation and phonetic-phonological transfer

Flege (2002) claims that L2 speech production is strongly constrained by the learners' L1-biased perception. According to his *Speech Learning Model*, as the perception of L1 phones develops throughout childhood and adolescence, the assimilation of phonetic qualities of L2 consonants and vowels is more likely to happen. If certain L2 phones continue to be identified as instances of L1 phonemes and allophones, the formation of new categories will be blocked. It is expected that the phonetic systems of L1 and L2 interact by means of the categorical assimilation

mechanism when there is a blocking in the formation of new categories. In this way, the L2 learners can, initially, produce the speech sounds of the L2 as if they corresponded to the speech sounds of the L1; so the L2 learner seems to be impelled to judge, indefinitely, the instances of a category of the L2 considered as similar to a category that belongs to L1 due to the fact that they do not notice any difference between the production of both of them. In this case, there is no change in the production of the sounds. When there is no formation of a new category, however, there will be a tendency of the bilinguals to develop a “hybrid” category of the L1 and the L2. This category will then take on the L1 and L2 speech sound properties that are different phonetically, but perceived as similar.

Vowel assimilation is seen here as an example of assimilation which can occur in relation both to spectral quality and to vowel duration. The process of vowel assimilation is very important indeed, since all the words have vowels, which are responsible for both accent and failures in communication. According to Jenkins (2001) and Walker (2001), the change in the vowel quality is not so important, because there is a great deal of variation in vowel quality among English native speakers from different countries and/or regions. However, the difference between English vowel duration is present in all dialects, and the English long vowels are long compared to the averages of vowel duration of nearly all known languages. As a consequence, the distinction between long and short vowels is more important than the accurate vowel quality, and this is usually the main concern in teaching the pronunciation of English vowels as an L2 (WALKER, 2001). Although pertinent in some of their comments, both Jenkins and Walker seem to neglect the importance of the changes that alter lexical distinctions.

5. Empirical Research

This study aimed to ascertain whether vowel assimilation would take place towards the vowel characteristics (F1,F2 and duration) of the participant's L1 (Portuguese) or his L2 (English), during a naming task in English.

The empirical research was field research done with a subject (case study) in a cross sectional way. The data were gathered from a male adult, native speaker of Brazilian Portuguese, who presented high proficiency in French (L2) and intermediate proficiency in English (L3), which was verified by applying two proficiency tests: DALF for French and TOEIC for English.

The data was collected from the recordings of naming tasks in the three languages spoken by the subject and they were acoustically analyzed with the software *Praat* (version 4.4.2.2). The words in the three languages presented to the subject were presented in carrier-sentences (*the last word is xxx, le dernier mot est xxx, a última palavra é xxx*), and each carrier-sentence was displayed at random five times during the presentation *powerpoint* file. All the target vowels were in stressed syllables in the words of the three tests. Below are the vowel pairs compared for two languages according to the International Phonetic Alphabet (Table 1).

Table 1: Vowel pairs compared between languages

Compared vowels for Portuguese and English (P - E)	Compared vowels for French and English (F - E)
P - E	F - E
ɛ - æ	ɛ - æ
ɛ - ε	ɛ - ε
i - i	i - i
i - ɪ	i - ɪ
u - u	u - u
u - ʊ	u - ʊ
ɔ - ɔ	ɔ - ɔ

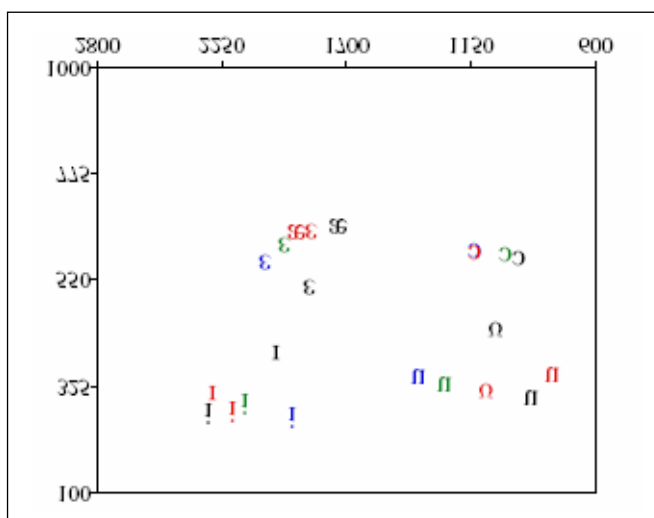
6. Results and discussion

The table below shows the Euclidian distances for F1 and F2 of all vowels.

Table 2: Euclidian distances for F1 and F2 of the French and English vowels and the Portuguese and English vowels produced by the subject

Distances	Pairs of vowels	F1		F2	
		Euclidian distance	Standardized distance	Euclidian distance	Standardized distance
French / English	ɛ - æ	65,47	10,1%	139,53	7,3%
	ɛ - ε	66,67	10,3%	207,73	11,3%
	i - i	15,60	5,7%	261,30	12,0%
	i - ɪ	48,78	15,8%	344,50	15,2%
	u - u	1,60	0,5%	589,00	75,9%
	u - ʊ	35,00	11,3%	297,00	27,8%
	ɔ - ɔ	4,70	0,8%	0,60	0,1%
Port. / English	ɛ - æ	29,80	4,6%	50,70	2,8%
	ɛ - ε	31,00	4,8%	118,90	6,5%
	i - i	16,20	5,9%	55,20	2,5%
	i - ɪ	16,98	5,5%	138,40	6,1%
	u - u	20,80	6,0%	473,25	61,0%
	u - ʊ	15,80	5,1%	181,25	17,0%
	ɔ - ɔ	4,47	0,7%	135,33	12,2%

Despite the fact that the Portuguese was closer in F1 and F2 for some pairs of vowels, the comparison of the Euclidian distances among the three languages must be carefully interpreted as important pairs, like /i/-/i/ and /u/-/u/, were closer in relation to Portuguese/English in just one of the characteristics under analysis. Picture 1 displays the participants acoustic space with plots of their vowel productions in the three languages investigated as well as the plots of the North American English vowels, described by Peterson and Barney (1952).



Picture 1: Vowels of the three languages produced by the subject (Portuguese in green; French, in blue; and English, in red), and vowels of Standard English, in black (PETERSON; BARNEY, 1952)

In the picture above, four different groups involving the vowels under study can be visualized. One group includes the vowels /i/ and /ɪ/, one the vowels /u/ and /ʊ/, a third one the vowels /ε/ and /æ/, and the last one the vowels /ɔ/ produced by the subject in the three languages. It can be seen, however, that the vowels /ɪ/, /ʊ/ and /ε/ from standard English were more prominent than the vowels produced by the subject for the vowel groups /i/, /u/, /u/, /u/ and /ε/, respectively. The vowel /u/ produced by the subject for English presented itself in a position of height and posteriority very close to what is considered standard for this language, moving away quite a lot from the other vowels crowded in this group, what makes us think that the subject is starting to create a specific category for this vowel in English. Even so, it is important to notice that the vowels /u/ in French and Portuguese produced by the

subject as well as the vowel /u/ in standard English have a very similar height. Thus, what seems to show the creation of a new category for this vowel is the fact that it is the only one that is more posterior, as would be just like what is expected for standard English.

As for the vowel /ʊ/, it is noticeable that the subject was able to produce it in a different way from the vowel /u/ of English, producing it in a more anterior acoustic space, as was expected for this vowel in standard English. However, there has been a great influence of the vowel /u/ in Portuguese and French in its positioning in terms of height.

In the vowel group that concentrates the production of the vowels /ɪ/ in standard English and /i/ in the three languages, it is possible to notice a slight distinction between the pairs of vowels /i/-/ɪ/ produced by the subject for the English language in terms of height. However, as was previously mentioned, the vowel /ɪ/ was produced in a more anterior way than was expected. Considering, then, the configuration presented for this vowel, it is not possible to state that a category is being formed because its position is too close to the other vowels produced by the subject for this group. In the analysis of the vowel /i/ produced for the English language, it is possible to notice that it did not present itself in a more defined vocalic space, even though it is close in relation to the height of the target-vowel of this language. However, it is necessary to say that the vowels /i/ in Portuguese and English were also produced by the subject at a very similar height. The vowel /i/ in French was the one that moved away the most from the group, as is visibly highlighted in the axis of F2.

As for the vowels /æ/ and /ɛ/ in this language, there was no adequate distinction between these two categories, as both vowels presented just one minimal differentiation in relation to the degree of anteriority/posteriority. When analyzing picture 1, it is possible to see that the subject produced such vowels lower than the /ɛ/ of Portuguese, French and standard English, and more posterior in relation to the /ɛ/ in Portuguese and French.

As for the group of vowels /ɔ/ distributed in the acoustic space, it is observed that the vowels in the French and English of the subject were in exactly the same place, not only in terms of F1, but also in terms of F2. However, it is necessary to say that the height between the vowels of the four analyzed systems (considering standard English) is very similar. In this way, the vowels in French and English of the subject stand out from the others (Portuguese of the subject and standard English) in a very clear way due to the fact that they are more anterior.

Having compared the Euclidian distance for F1 and F2 of the pairs of vowels in the three languages included in this study, and having compared these distances with the expected positioning for standard North-American English, it is still necessary to study the distance for duration found between the very same pairs of vowels. Before doing this, however, the average values of duration for each language are displayed below, so that it is possible to compare the averages presented for the vowels in the three languages (Table 3).

Table 3: Descriptive statistics for duration (in seconds) by language

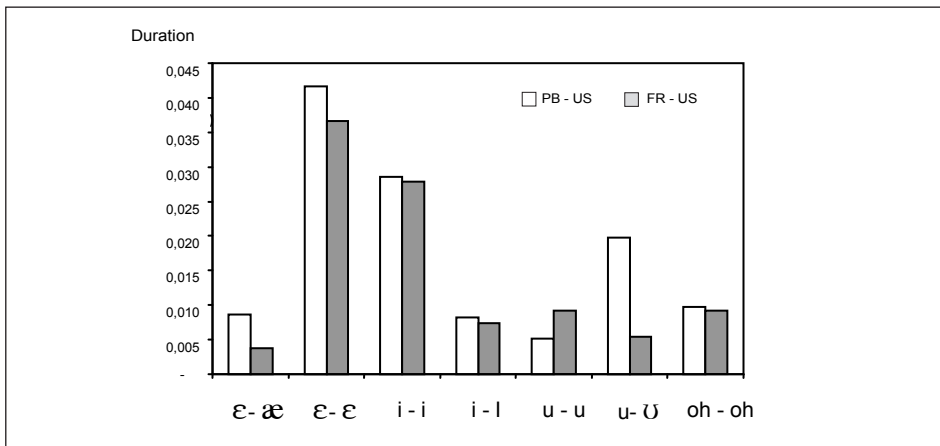
	Vowel	Duration			
		Min.	Max.	Average	Standard-deviation
English	æ	0,0827	0,0922	0,0880	0,0047
	ɛ	0,1115	0,1265	0,1210	0,0058
	ɪ	0,0536	0,1338	0,0875	0,0277
	ɪ	0,0536	0,0926	0,0671	0,0125
	ɔ	0,0708	0,0879	0,0781	0,0064
	U	0,0408	0,0708	0,0562	0,0113
	ʊ	0,0521	0,0901	0,0708	0,0115
French	ɛ	0,0601	0,1029	0,0843	0,0130
	ɪ	0,0450	0,0718	0,0597	0,0087
	ɔ	0,0761	0,1126	0,0873	0,0128
	U	0,0590	0,0772	0,0654	0,0078
Portuguese	ɛ	0,0658	0,0874	0,0794	0,0095
	ɪ	0,0440	0,0791	0,0589	0,0152
	ɔ	0,0606	0,0764	0,0682	0,0079
	U	0,0380	0,0595	0,0511	0,0094

By observing the data from table 3, it is possible to see that the Brazilian Portuguese vowels were the ones that had the smallest average values for duration. All the vowels analyzed in this language are shorter than their corresponding ones in French and in English. In comparison between the L2 and the L3 of the subject, the vowels in English that presented the highest values were /ɛ/ and /i/, and the vowels of French that were longer were /ɔ/ e /u/. With the analysis of the gross values, it was possible to present the Euclidian distance values calculated for the pairs of vowels of different languages (Table 4).

Table 4: Euclidian distances between Portuguese/English and French/English for duration of the vowels produced by the subject

Euclidian Distance	Pairs of vowels	Portuguese – English		French – English	
		Euclidian Distance	Standardized Distance	Euclidian Distance	Standardized Distance
	ɛ - æ	0,0086	7,1%	0,0038	4,3%
	ɛ - ɛ	0,0416	34,4%	0,0367	30,3%
	ɪ - i	0,0286	32,6%	0,0278	31,7%
	ɪ - ɪ	0,0082	12,2%	0,0074	11,0%
	u - u	0,0051	9,1%	0,0092	16,4%
	u - ʊ	0,0198	27,9%	0,0054	7,7%
	ɔ - ɔ	0,0098	12,6%	0,0092	11,8%

The Euclidian distance between Portuguese/English and French/English shows that the languages produced with the closest duration values were French and English. The durations were noticeably closer between these languages for the pairs of vowels / ϵ /-/ $\text{\text{æ}}$ /, / ϵ /-/ ϵ / and /u/-/u/. As for the pairs /i/-/i/, /i/-/ɪ/ and /ɔ/-/ɔ/, the distances between French and English were slightly smaller than the ones found for Portuguese and English. The only compared vowel pair that presented a smaller distance between Portuguese and English was /u/-/u/. For a clearer idea of the distances between the pairs of vowels compared for the languages, the chart below (picture 2) presents the averages obtained for duration.



Picture 2: Euclidian distances (duration) between Portuguese/English (BP - US) and between French/English (FR - US) (ϵ = $\text{\text{æ}}$, ϵ = ϵ , i = i, i = ɪ, u = u, u = ʊ, oh = oh)

If the results of the analysis of the Euclidian distances of F1 and F2 for the pairs of vowels are taken together, it is possible to see that there was a hybrid tendency for the production of the L3, as the production in this language presented both characteristics of the vowels of the L1 and L2 of the subject. For the characteristics of F1 and F2, although the distances were smaller between Portuguese and English in the comparison of four pairs of vowels (/i/-/ɪ/, /u/-/u/, / ϵ /-/ $\text{\text{æ}}$ /, / ϵ /-/ ϵ /), such tendency was not found in the comparison of the pairs /i/-/i/, /u/-/u/, as it was possible to observe a higher approximation between French and English for F1 and between Portuguese and English for F2 in these pairs. The pair /ɔ/-/ɔ/, which presented a smaller distance between French and English for F2, evidenced similar values not only in the comparison between Portuguese and English, but also in the comparison between French and English for F1. In this way, a certain degree of hybridism was found in vowel categories produced by the participant.

In the results obtained in the comparison of Euclidian distances for duration, the proposition of hybrid categories for the vowels of English produced by the subject is more strongly corroborated. The values found for duration have shown a greater similarity in French and English, as six out of seven pairs of vowels evidenced smaller distances between French and English produced by the subject. In this way, it was possible to see that the joint analysis of the three characteristics observed in the vowels of the English language (F1, F2 and duration) showed that no vowel presented all their characteristics assimilated by just one of the languages previously acquired by the subject.

7. Discussion

The proposition defended by Flege (2002) in his studies in L2 that hybrid categories for L1 and L2 would be formed from the impossibility of generating new ones due to a great similarity between two sounds of different languages can also be useful to explain the results found in this study. When taking into account the possibility of a hybrid tendency for the production of sounds from two different systems, the finding of Flege (2002) for the field of L2 can be redirected to the inclusion, equally, of the L3 as being part of this hybrid system.

According to Hammarberg (2001), the L2 will be noticed with more emphasis in the production of L3 mainly if a high proficiency level in L2 is achieved in a natural learning environment. As the subject of this study, even though his proficiency was considered advanced in French as L2, his contact with this language was nurtured only in a formal learning environment, and since the conclusion of his graduation in the Letters course in French, his practice with the L2 has been extremely limited. So, the high proficiency level observed in the L2 was not enough to inhibit completely the effects of the mother tongue of the subject in his oral production in L3. The expected recency effect pointed out by the same author as an important factor for the massive activation of the L2 at the moment of production in L3 could also not come into play with more emphasis so that the learner of L3 required the L2 more than the L1. As the L2 has not been activated by the subject in a meaningful way, it was not so accessible during the production of the L3. Therefore, not only the L2, but also the L1 served as a source for the occurrence of the assimilation of the characteristics of the L3 vowels.

As the L2 and the L3 of the subject were learned in the same context, that is, in the same formal learning environment, a psychotypology effect could be expected, strongly associating the two languages for this reason. However, it seems that the psychotypology effect identified between the L2 and L3 was not as strong as the one observed between the L1 and the L2 of the subject, as there seems to have been a more prominent association between these last two due to the fact that both belong to the same linguistic family, that is, the one of the Latin languages. Taking into account the fact that Portuguese and French created a strong association because they belong

to the same linguistic family, it is possible to state that the subject was not able to set solid categories for the sounds of his L2.

As to the interpretation of the results in the light of the HipCort model, we can infer that the three languages are prone to being activated simultaneously by the neuronal networks, and their spectral and durational characteristics may have been assimilated. Thus, this contact among them generates a hybrid production in the less entrenched language, as it can be observed in the L3 involved in this study, the English language.

Once more, Flege (2002) is mentioned to give support to the proposition of hybrid categories in the L3 because this author defends, based on his studies in the field of phonetics, a wide interaction between the bilingual phonetic systems, the destitution of any of these systems not being possible at the moment of the oral production in one of the learned languages. To support this idea, it is believed that the characteristics of the L1 and the L2 of the subject were transferred in a balanced way to his L3, including the relationship between the three languages according to a *continuum* of approximations that go towards their phonetically expected sounds for the L3 (FLEGE, 1980). The idea adopted by this study on the relationship between phonetics and phonology can also be mobilized to underpin the proposition of hybrid categories in the L3, as the existence of a *continuum* is also imagined between the perception and the production of the subject for the languages he knows. This *continuum* could be evidenced by the calculated distances for the characteristics (F1, F2 and duration) of the vowels produced by the subject, as indications of both his L1 as well as L2 were found in his productions. The categories formed for the L3, then, are considered as the product of the slope between the analyzed languages.

6. Final Remarks

When researching into the way previously acquired languages can influence the learning of a subsequent one, the formation of hybrid categories was observed for the L3 of the subject at the same time as there is evidence that the subject is starting to acquire the characteristics found in the vowels of the L3. These results are in accordance with the connectionist view of L2 acquisition and with the ideas of Flege (2002) to the extent that we believe in the interaction between the linguistic knowledge in the neuronal networks. Even if characteristics of previously acquired linguistic systems are always noticed to a certain degree in the production of a new language, it is shown with this study, the capacity that the subject has to learn new linguistic patterns.

Although a higher influence of the participant's L2 vowel characteristics on the quality and duration of the vowels produced in his L3 was not observed, the results show a higher complexity in terms of processes that can occur when we work with three linguistic systems. Further studies, with a higher number of participants, are needed to ascertain whether the tendencies observed here are confirmed.

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Psycholinguistic Aspects of Translation

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Theorie interpretative de la traduction et les variations culturelles: Une etude comparative – un film brésilien en France, un film français au Bresil

1. Introduction

L'approche interprétative de la traduction en quatre étapes permet d'examiner un texte original dans une langue et sa traduction dans une autre dans une double dimension cognitivo-référentielle : celle de la culture de départ et celle de la culture d'arrivée. Elle permet par ailleurs d'observer les traitements linguistiques de la variété cognitivo-référentielle dans le texte traduit ainsi que leurs raisons d'être (SRPOVÁ, 2004). Sousa (2005) applique cette approche à l'analyse des différences culturelles entre France et Brésil telles qu'elles apparaissent à un public ordinaire dans sa perception d'un film sous-titré en langue étrangère (La Cité de Dieu sous-titré en français, Le Fabuleux destin d'Amélie Poulain sous-titré en portugais brésilien). Concernant les résultats de la perception réciproque française-brésilienne par le biais des deux films, ils confirment d'une part des données découvertes par l'anthropologie comparée (notamment dans le domaine de la proxémie verbale et non verbale), puis l'existence du déterminisme ethnocentrique dans la perception des éléments d'un ethno-univers étranger (ex. fr. train de banlieu > brés. train grandes distances). Concernant la technique de la traduction utilisée par le sous-titrage de chaque film, un relevé statistique des traitements linguistiques des différences culturelles fait ressortir que le sous-titrage du film brésilien a tendance à conserver les spécificités culturelles françaises par la traduction littérale alors que le sous-titrage français tend à neutraliser les spécificités culturelles brésiennes par l'adaptation. Ces faits sont ensuite comparés avec les données obtenues par l'analyse de la perception (SRPOVÁ, 1994) de ces spécificités par le public interrogé: il apparaît que la perception de ces spécificités semble en effet être orientée par le traitement linguistique des différences culturelles dans le sous-titrage.

Nous nous proposons d'exposer ici un travail de recherche (SOUSA, 2005) consacré à l'interculturalité en traduction, qui a été conduit à l'Université de la

Sorbonne Nouvelle dans le cadre du programme de maîtrise au sein de l'UFR de Didactique du Français Langue Etrangère.

Il s'agit d'une étude de cas où nous appliquons l'approche développée par Srpová (2004) pour analyser les différences culturelles entre France et Brésil telles qu'elles apparaissent à un public ordinaire dans sa perception d'un film sous-titré en langue étrangère (La Cité de Dieu sous-titré en français, Le Fabuleux destin d'Amélie Poulain sous-titré en portugais brésilien).

Notre hypothèse, dans le cadre du cinéma, est que l'observation des codes culturels présents dans des situations d'interaction authentiques peut se faire dans les films de fiction "ordinaires", qui atteignent un grand nombre d'individus et constituent par ailleurs un instrument important de la politique culturelle des pays (GAMBIER, 1996).

Tout comme dans les situations d'interactions qui ont lieu dans la vie réelle, les films de fiction sont une source riche de signes, qui s'inscrivent dans un fond collectif fortement partagé. Les images constituent un élément fondamental au film (AUMONT, 1983): elles montrent toute une panoplie de gestes, de mimiques, de postures, de comportements et d'autres signes non verbaux émis par les personnages. Les signes paraverbaux sont également présents grâce à sonorité. Les signes verbaux apparaissent généralement à travers les dialogues des personnages et de la narration d'un film. Lorsque les films sont destinés à un public étranger, ces codes verbaux prennent forme du doublage ou du sous-titrage. Ayone (1989, p. 29) soutient que "lire un film c'est percevoir de la langue écrite (générique, intertitres, fragments textuels, sous-titres), de la langue parlée (paroles, intonations), des signes gestuels (mimiques, gestes), des images dans leur contenu, dans leur échelle, dans leur mouvement, dans leur succession, des sons (bruits, musique) et surtout la relation de tous ces éléments entre eux et avec les articulations du récit. Ces perceptions multiples et complexes se font 'naturellement'." Comprendre un film consiste en somme à décoder le message transmis par des signes verbaux, paraverbaux et non verbaux.

1.1 *Corpus*

Notre *corpus* est construit à partir de deux films contemporains ayant connu un succès considérable d'audience dans leurs pays d'origine respectifs. Bien qu'antagoniques par leurs genres – l'un étant un drame violent survenu dans une favela à Rio de Janeiro (Brésil) et l'autre, une comédie romantique qui a lieu à Paris (France) – tant le film brésilien, La Cité de Dieu (MEIRELLES, 2003) que le film français, Le fabuleux destin d'Amélie Poulain (Jeunet, 2001) ont lieu dans des métropoles représentatives de deux pays. Cet aspect géographique bien défini, puis des personnages et situations typiques donnent aux histoires un aspect réaliste qui fait plonger le spectateur dans les univers culturels qui y sont construits.

En ce qui concerne le contexte de chaque film, dans La Cité de Dieu, une adaptation cinématographique du roman éponyme de Lins (2003), des habitants d'une favela au Rio de Janeiro ont leur sort défini par le trafic de drogues. Quant au film

français, il s'agit d'une histoire de rencontre amoureuse d'un jeune couple parisien qui a lieu dans les environs du 18ème arrondissement de Paris.

Le corpus a été composé de certains éléments culturellement spécifiques à chaque univers représenté dans les films. Le choix de la typologie adoptée de ces éléments sont détaillés dans la section de méthodologie ci-après.

1.2 *Objectif*

Notre objectif consiste à examiner par le biais de la traduction:

1. Comment le public de culture française perçoit des éléments de la culture brésilienne véhiculée dans la version sous-titrée de la Cité de Dieu.
2. Comment le public de culture brésilienne perçoit des éléments de la culture française véhiculée dans la version sous-titrée du Fabuleux destin d'Amélie Poulain.

2. La spécificité du sous-titrage

Le sous-titre est à la fois une grandeur de traduction au cinéma et une unité de sens du film. (MACHADO, 1997, p. 263). Gambier (*op. cit.*, p. 54), quant à lui, considère le sous-titre selon la fonction qu'il remplit auprès du public étranger:

- la fonction informative, au service de l'écran et des signes sémiotiques non verbaux;
- la fonction narrative, par conséquent mimétique et culturelle, liée à des sociolectes déterminés et à des systèmes de valeurs.

C'est une évidence : le sous-titre est limité à l'espace d'un écran (petit ou grand, selon le support du film). Il est donc fondamentalement concis, synthétique. Gambier (*op. cit.*, p. 145) établit une liste d'une série d'autres contraintes auxquelles le sous-titre doit obéir afin de ne pas devenir un obstacle matériel à la réception du message, à savoir:

- son apparition à l'écran: c'est le principe de synchronisation. Trop lent ou trop rapide, il perd le lien avec les images.
- sa taille : il doit rester discret. Verticalement, il ne doit pas prendre trop d'importance par rapport aux images. Horizontalement, il doit se limiter au minimum de lignes possibles.
- le respect des plans : le sous-titre doit tenir compte plutôt des discours des personnages au premier plan.
- la lisibilité : il doit être suffisamment contrasté par rapport aux couleurs des images pour pouvoir être lu.

Le sous-titre ne peut garder que l'essentiel dans le passage de l'oral à l'écrit, ce qui fait que beaucoup d'informations ne figureront pas à l'écran. La plupart des informations concernées par la suppression ou la condensation sont considérées comme secondaires à la compréhension du film. Ce sont des informations ayant une fonction phatique ou émotive dans le sens jakobsonien (GAMBIER, *op. cit.*, p. 154).

D'autre part, il est difficile d'affirmer que toutes les informations supprimées ou condensées dans la pratique soient le résultat d'une manipulation par contrainte d'espace ou qu'elles s'inscrivent réellement dans le critère de "secondarité" dans la compréhension du film. Pour ce travail, les éventuelles suppressions/condensations ne seront prises en compte que si elles convergent avec notre problématique, qui concerne le traitement linguistique des spécificités culturelles de l'univers étranger.

Le sous-titre constitue ainsi l'élément linguistique sur lequel s'appuie notre analyse des spécificités culturelles contenues dans le message des deux films choisis et de la perception de ces spécificités par le public d'arrivée.

3. Cadre theorico-methodologique: la perception contrastive et la théorie interprétative en quatre étapes

Comme il sera question d'observer la culture, il convient d'éclairer la façon dont nous entendons cette notion dans notre travail. Selon le Petit Robert, la culture est un "ensemble des aspects intellectuels propres à une civilisation, une nation". Lorsque nous parlons d'une culture en particulier (brésilienne, française, etc.), nous adoptons l'expression ethno-univers (brésilien, français, etc.) qui désigne "l'ensemble référentiel délimité par les savoirs et les usages d'une communauté qui se manifeste comme un corps constitué" (SRPOVÁ, 1991, p.70, 1994, p.233).

Étudier la perception d'un film relève de la perspective de la compréhension: il s'agit, pour un contexte donné, de comprendre la forme d'un signe codé selon chaque ethno-univers de référence. L'approche contrastive permet d'étudier le fonctionnement des signes (énoncés, comportements, objets, etc.) dans une situation de communication commune aux deux ethno-univers ainsi mis en contraste. Par situation de communication, nous entendons le "contexte extralinguistique qu'il faut prendre en compte et qu'il faut expliciter pour localiser un objet extralinguistique en vue de l'interprétation de son sens" (SRPOVÁ, 1994, p. 10). Ensuite, il faut étudier, dans la perspective de la compréhension des formes, les sens spécifiques à chaque ethno-univers de référence. L'application de cette approche est détaillée dans la section de méthodologie.

Nous adoptons pour ce travail la théorie interprétative de la traduction (SELESKOVITCH; LEDERER, 1984, 1989). Cette théorie est issue de la pratique de l'interprétation des conférences et qui a été appliquée par la suite dans le cadre de la didactique de la traduction par Seleskovitch et Lederer. L'intérêt de cette théorie pour notre démarche réside dans le fait qu'elle repose sur l'interprétation du sens des énoncés dans un texte, alors qu'une approche linguistique repose surtout sur une perspective comparatiste des codes linguistiques. L'un des principes de base de cette théorie est que sens et signification linguistique sont nettement distingués. Le sens appartient au domaine du discours, il est dynamique alors que la signification linguistique appartient au plan de la langue, elle est constante. Le sens n'est jamais la somme des significations du code linguistique. Il se construit dans le processus

de communication. Selon la théorie interprétative, lorsqu'on traduit un énoncé dans une langue de départ (LD) vers une langue d'arrivée (LA), on cherche à établir une équivalence de sens et non une correspondance linguistique donnée par les dictionnaires.

C'est pourquoi la traduction est entendue ici comme:

une reformulation d'un message formulé dans une langue de départ et encodé à l'intérieur de l'univers (ethno-univers) cognitivo-référentiel de la culture de départ dont la mise en langue de départ est l'expression, en un message équivalent formulé dans une langue d'arrivée et encodé à l'intérieur de l'univers (ethno-univers) cognitivo-référentiel de la culture d'arrivée dont la mise en langue d'arrivée est l'expression (SRPOVÁ, 1991, p. 65).

Pour traduire vers une autre langue le sens d'un texte rédigé dans une langue de départ, le sujet traduisant a donc recours à ses connaissances extralinguistiques ou "compléments cognitifs" (SELESKOVITCH; LEDERER, 1989, p. 39). L'appel à des compléments cognitifs s'avère donc intrinsèque au processus de traduction, et il a des implications directes sur la perception du message. Si nous résumons la position de Seleskovitch et Lederer (1989, op. cit., pp. 37-42), l'opération traduisante comporte trois étapes à savoir:

1. La compréhension du texte de départ (LD).
2. La déverbalisation du sens.
3. La réexpression du sens dans le texte d'arrivée (LA).

Peut-on reconnaître la place accordée à la dimension culturelle dans l'opération traduisante ? Essayons d'en donner quelques éléments de réponse dans la section suivante.

4. Methodologie d'analyse des spécificités interculturelles dans le sous-titrage

Nous pouvons décrire la perception contrastive des formes linguistiques (en comparant la version originale et la version sous-titrée correspondante) pour essayer d'établir les différences extralinguistiques entre les ethno-univers concernés (l'ethno-univers brésilien et l'ethno-univers français) dans les films choisis. Pour ce faire, nous nous appuyons sur le traitement linguistique des différences extralinguistiques (SRPOVÁ, 1991, 2004). Nous nous abstenons de juger si la traduction est "bonne" ou "mauvaise", "exacte" ou "fausse", ou encore si elle est satisfaisante ou non sur le plan esthétique. Il s'agit plutôt de réfléchir – d'après les choix opérés par le traducteur qui, soit conserve soit neutralise les différences extralinguistiques – sur les implications de la traduction concernant la perception des spécificités culturelles de la culture de départ par le public de la langue d'arrivée.

La traduction n'est donc pas seulement le passage d'une langue de départ (LD) à une langue d'arrivée (LA), elle est aussi une forme de transmission du sens des énoncés véhiculés de la LD à la LA, qui supposent respectivement une culture de départ

(CD) et une culture d'arrivée (CA). En rappelant l'importance de la théorisation de la traduction par Nida, Cary (1985) et Mounin (1963), Srpová (1991, p.64) considère l'opération traduisante comme un processus à quatre étapes, à savoir:

1. Comprendre le texte de départ (LD).
2. Comprendre le sens du texte original en fonction du public de la culture de départ (CD). (C'est nous qui soulignons)
3. Situer, réinterpréter le sens compris en (2) en fonction du public de la culture d'arrivée (CA). (C'est nous qui soulignons)
4. L'exprimer dans le texte de la langue d'arrivée (LA).

Lors de la division de l'étape de la déverbalisation de Seleskovitch en deux, la problématique du traitement linguistique des différences extralinguistiques (culturelles) dans la traduction est rendue explicite, ce qui nous fournit un outil d'analyse nécessaire à notre travail. Il appartient au traducteur de mettre à disposition du public de la culture d'arrivée les équivalents extralinguistiques ou "cognitivo-référentiels" nécessaires à l'appréhension de la culture de l'Autre. Selon Srpová (1991, 2004), "une spécificité cognitivo-référentielle de la culture de départ est conservée [linguistiquement] dans le texte d'arrivée ou elle ne l'est pas".

Dans le premier cas, elle peut être conservée par certains procédés linguistiques, accompagnés ou non d'explication du traducteur. Dans le deuxième cas, la spécificité cognitivo-référentielle est neutralisée par adaptation, par un terme générique ou par suppression.

Nous reproduisons ci-dessous un tableau récapitulatif regroupant les deux cas de figure:

Tableau 1: Traitements linguistiques d'une spécificité référentielle ou cognitive de la CD dans la traduction (SRPOVÁ, 2004)

I. Procédés linguistiques de la conservation d'une spécificité référentielle ou d'une spécificité cognitive de la CD dans la traduction			II. Procédés linguistiques de la neutralisation d'une spécificité référentielle ou d'une spécificité cognitive de la CD dans la traduction		
a) emprunt, calque, traduction littérale	b) emprunt, calque, traduction littérale + explication	c) emprunt, calque, traduction littérale + explication + comparaison avec la CA	a) suppression de l'élément linguistique qui désigne cette spécificité	b) terme générique	c) adaptation

5. Établissement du *corpus*

Pour établir notre *corpus*, nous avons visionné une dizaine de fois les films choisis en version sous-titrée en langue d'arrivée, sur support DVD en essayant de repérer dans le sous-titrage des éléments comme des faits, des objets ou des notions appartenant

exclusivement à l’ethno-univers de départ et susceptibles de poser problèmes de compréhension au public de l’ethno-univers d’arrivée. Comme point de départ, nous avons choisi ces éléments selon notre propre ressenti par rapport aux cultures que nous côtoyons (la brésilienne et la française). C’est par un test de perception (un éventail de 60 questions au total)¹ mené auprès de quelques locuteurs natifs que nous avons confronté la perception par le public brésilien et par le public français des éléments culturellement spécifiques préalablement choisis, présentés dans certains passages des deux films et traités linguistiquement dans les sous-titres. Ce test nous a servi également de moyen de repérage des éléments culturels que nous n’avions pas encore répertoriés, puis il a permis de valider ou non notre choix de départ.

Les différences extralinguistiques ont été catégorisées à l’aide du classement adopté par Serra (1995, p.16) et des notions de références diverses (HALL, 1971; KERBRAT-ORECCHIONI, 1994; SALINS, 1992; GALISSON, 1991), que nous avons réaménagées en fonction de notre corpus pour obtenir la typologie suivante:

- Réalités référentielles, “du premier ordre”: objets, produits (spécialités culinaires, agricoles, industrielles), faune, flore.
- “Espace à organisation fixe” (HALL, 1971, p. 132)² architectures, urbanisme, bâtiments, lieux, monuments.
- Mots “à C.C.P.” (Charge Culturelle Partagée) (GALISSON, 1991, pp.109-160): ce sont des mots de vocabulaire dont le sens porte une “valeur ajoutée” qui est connue des natifs et inaccessible pour les non natifs, comme par exemple les noms de marques spécifiques à chaque culture de référence.
- Comportements d’ordre socio-linguistique (HYMES, 1984): formes d’adresse.
- Représentations du monde différentes : ici nous regroupons des aspects qui se manifestent différemment selon les cultures, comme la musique et la religion.

6. Analyse de données et résultats

Nous avons extrait du film *La Cité de Dieu* 11 exemples qui représentent des spécificités culturelles brésiliennes par rapport à l’ethno-univers français. Pour le film *Le fabuleux destin d’Amélie Poulain*, nous avons trouvé 14 exemples qui représentent des spécificités culturelles françaises par rapport à l’ethno-univers brésilien. Les éléments ont été analysés selon les types de traitement linguistique des différences culturelles dans la traduction figurant au tableau ci-dessus.

¹ La description des étapes de ce test figurent dans Sousa (2005, pp. 30-31). Les trente-trois questions du test de perception qui concerne le film *La Cité de Dieu* se trouvent à l’annexe A, pp. 148-159. Les vingt-sept questions sur le film *Le fabuleux destin d’Amélie Poulain* se trouvent à l’annexe B, pp. 160-168.

² L’espace à organisation fixe “comprend des aspects matériels, en même temps que les structures cachées et intériorisées qui régissent les déplacements de l’homme sur la planète. Les bâtiments construits sont un exemples d’organisation fixe. De même, leur mode de groupement comme leur mode de partition interne correspond également à des structures caractéristiques déterminées par la culture”.

6.1 Exemple: La Gare du Nord (Paris)

Pour illustrer notre démarche d'analyse, nous reprenons un exemple (SOUSA, *op.cit.*, p. 128) extrait du film français (scène au chapitre 3 accessible au menu du support DVD) où se présente un cas de **neutralisation par suppression** (Tableau 1, IIa).

Souvent le week-end, Amélie prend le train, Gare du Nord, pour aller rendre visite à son père.

Nos fins de semana, Amélie pega o trem para visitar o pai.

Différence extralinguistique: "réalité" référentielle du premier ordre, lieu appartenant exclusivement à la culture de départ.

Amélie apparaît souvent en se déplaçant dans les galeries du métro ou en déambulant dans une gare. C'est à la Gare du Nord qu'elle prend souvent le train pour aller en banlieue. Dans le sous-titre, la référence à la Gare du Nord est supprimée.

6.1.1 Questions du test de perception

Na sua opinião, as viagens de visita ao pai que Amélie faz nos fins de semana são longas ou curtas?

Selon vous, les déplacements d'Amélie pour voir son père sont-ils de longue durée ou de courte durée?

É comum fazer viagens de trem no seu país?

Est-il courant de voyager en train dans votre pays?

6.1.2 Perception par le public français

Voyager en train fait partie du style de vie des Français, grâce à un réseau de voies ferrées très dense et populaire qui dessert tout le pays. Paris est très représentatif de ce point de vue, car tout le réseau de transports français converge vers la capitale. En prenant le train à la Gare du Nord, l'une des plus grandes gares de la capitale, Amélie fait ce que font quotidiennement des milliers de jeunes Franciliens qui habitent à Paris et qui prennent le train de banlieue pour passer le week-end avec leurs parents.

6.1.3 Perception par le public brésilien

Bien que le Brésil soit un pays grand comme un continent, les moyens de transport de masse y sont considérablement réduits par rapport à la France. Le métro n'existe que dans des grandes villes et encore, beaucoup d'habitants de ces villes s'en passent. Pour les voyages inter-régionaux et les déplacements dans les périphéries, le bus, l'autocar et la voiture sont les moyens les plus utilisés. Le transport de masse par voie ferrée est quasiment inexistant, de sorte qu'une gare veut dire souvent au Brésil une gare d'autobus ou d'autocar. Dans l'imaginaire collectif brésilien, voyager en train relève d'un certain exotisme.

Le public brésilien moyen, celui qui ne connaît pas la France, comprend qu'Amélie est dans une gare de trains parce que l'image la montre en marchant vers un train au bord du quai. Mais il ne comprend pas qu'il s'agit d'un court voyage dans une banlieue parce que cette réalité lui est étrangère. Un voyage en train implique pour lui un déplacement long, qui ne se fait pas quotidiennement.

L'absence de référence à la Gare du Nord (et, par conséquent, à Paris) dans le sous-titrage ne nuit pas à la compréhension de la scène par le public brésilien (Amélie prend un train pour rendre visite à son père). En revanche, cette absence prive les spectateurs de la possibilité d'"apprendre un peu plus sur Paris" (comme l'a affirmé un informateur brésilien).

En dressant un bilan d'analyse pour chaque film, nous avons abouti aux résultats suivants:

6.2 Tableaux de résultats et leurs commentaires

Tableau 2: Résultats de La Cité de Dieu

Total d'éléments analysés:	11
Conservation par traduction littérale sans explication:	3
Conservation par traduction littérale avec explication:	1
Neutralisation adaptative:	3
Neutralisation généralisatrice:	4
Neutralisation par suppression :	0

Tableau 3: Résultats du Fabuleux destin d'Amélie Poulain

Total d'éléments analysés:	13
Conservation par traduction littérale sans explication:	9
Conservation par traduction littérale avec explication:	0
Neutralisation adaptative:	0
Neutralisation généralisatrice:	3
Neutralisation par suppression:	2

D'après ces bilans, la traduction française a tendance à neutraliser les spécificités référentielles de l'ethno-univers brésilien en les remplaçant soit par des spécificités référentielles françaises (adaptation), soit par des classes génériques (généralisation). Le choix adaptatif pour certains comportements typiques de la culture brésilienne donne lieu à une interprétation ethnocentrique. C'est le cas, par exemple, du "motel" brésilien (chapitre 2):

6.3 Exemple: motel brésilien

Cabeleira: *Esse aí que é o **hotel**, Dadinho?*

Dadinho: *É esse aí mesmo.*

Tignasse: *C'est ce **motel**-là?*

Petit Dé: *Oui.*

La différence extralinguistique ici présentée concerne des représentations du monde et l'élément choisi un "espace à organisation fixe". Dans la séquence analysée, un *motel* est le lieu d'un braquage suivi d'un meurtre commis par le Trio Tendresse et leur apprenti Petit Dé. Il convient d'observer que le *motel* est bien caractérisé dans la scène : à l'extérieur, un panneau lumineux où s'affiche le mot "*MOTEL*" et des lampes de couleur rouge, en forme de cœur. A l'intérieur, dans les différentes chambres, les clients ont des rapports sexuels. Quant aux sous-titres de la scène, nous observons que Tignasse se réfère à cet établissement par le terme neutre *hôtel*, alors que dans la scène le terme *motel* est bien écrit sur le panneau en néon.

A la différence d'autres types d'hôtels, un *motel* brésilien est facturé à l'heure et ne sert que pour des rencontres intimes, surtout si l'on veut préserver son intimité et être discret. Cela est d'autant plus vrai que toute la structure d'un *motel* est conçue pour garder l'anonymat des clients. Un peu de cette structure est montrée dans le film, à la scène où le Trio Tendresse prend une voiture dans un espace qui ressemble à un garage. Chaque chambre donne effectivement sur un garage privé qui est le seul moyen d'accès à cette chambre. Comme dans un *drive-in*, les clients arrivent en voiture à la réception où ils reçoivent la clé de la chambre. Ensuite ils se dirigent, toujours en voiture, vers cette sorte de garage où se trouve la porte qui ouvre la chambre. Après avoir stationné dans cet espace, les clients peuvent baisser la grille pour cacher la voiture et pouvoir finalement entrer dans la chambre. Ainsi les clients ne se croisent jamais car l'accès aux chambres ne se fait pas par les parties communes du motel (hall, couloir ou ascenseur). Leur anonymat est protégé par le fait qu'ils se déplacent en voiture jusqu'aux chambres. Il convient de préciser également que le *motel* brésilien ne constitue pas un lieu de prostitution.

Nous avons comparé les différentes acceptions du terme trouvées dans les dictionnaires brésiliens et français :

Tableau 4: Acceptions du mot Motel

<i>Aurélio</i> (Holanda Ferreira, 1993)	1. <i>hotel situado à beira de estradas de grande circulação, dotado de apartamentos ou quartos para hóspedes, estacionamento para automóveis e, às vezes, restaurante.</i> "hôtel situé au bord de routes à grande circulation, doté d'appartements ou de chambres pour les clients, de parking pour les voitures et, parfois, de restaurant" (traduction approximative). 2. <i>hótel de alta rotatividade. Aquele em que se alugam quartos para encontros amorosos.</i> "hôtel de haute rotativité. Celui où l'on loue une chambre pour des rapports sexuels."
<i>Le Petit Robert</i> Ronai, 1989	(Anglicisme) Hôtel situé au bord des routes à grande circulation, aménagé pour recevoir les automobilistes de passage. Ex: " <i>nous entrons dans le Nevada. (...) Enfin les premiers motels s'allument</i> " (<i>Beauvoir</i>) Motel

Bien que l’acception 1 de l’*Aurégio* porte le même sens que celle du *Petit Robert*, elle n’est pas d’usage au Brésil. Ainsi, un propriétaire d’un hôtel brésilien “situé à bord des routes” évitera d’utiliser le terme *motel* pour caractériser son établissement sur les éventuels panneaux ou affiches publicitaires, quitte à le voir confondu avec un hôtel où “l’on loue une chambre pour des rapports sexuels”. En France, les hôtels situés au bord d’une route semblent s’appeler par la forme non-marquée d’*hôtel*, comme notamment ceux de la chaîne *Hôtels Formule 1*. Dans l’exemple fourni par le dictionnaire français, le terme *motel* est associé à son origine américaine (un mot-valise formé à partir de *mo*-torway et *ho*-tel).

D’après l’extrait, la traduction renvoie au seul sens qui existe dans la culture française, à savoir un “hôtel situé au bord des routes à grande circulation, aménagé pour recevoir les automobilistes de passage”. La spécificité culturelle brésilienne est donc remplacée par une spécificité culturelle d’origine américaine, qui existe en France. Le seul moyen d’accès au sens du *motel* brésilien par le public français est le contexte visuel de la scène.

6.3.1 *Questions du test de perception*

D’après vous, où le Trio Tendresse fait-il le hold-up ? Pourquoi les personnages l’appellent-ils un motel?

(Cena do roubo no motel) Na sua opinião, onde o Trio Ternura está praticando o roubo? Por que os personagens chamam esse lugar de motel?

Y a-t-il des motels en France ? Y a-t-il des endroits comme celui montré dans le film en France? Quels objets vous permettent-ils d’identifier cet endroit?

Existem motéis na França ? Existem lugares como aquele mostrado no filme na França? Que objetos permitem-lhe de identificar esse lugar?

Dans la scène où le Trio prend la voiture pour quitter le motel, comprenez-vous où ils sont exactement? Pour vous, s’agit-il d’un parking, d’un garage ou autre lieu que vous connaissez?

Na cena em que o Trio Ternura pega o carro para fugir do motel, você entende onde eles estão exatamente? Na sua opinião, trata-se de um estacionamento, uma garagem ou outro lugar que você conhece?

Quel genre de clientèle fréquente un motel au Brésil?

Que tipo de clientela frequenta um motel no Brasil?

6.3.2 *Perception par le public brésilien*

Le public brésilien sait exactement de quel type d’établissement il s’agit rien qu’en regardant la scène qui montre, entre autres signes, le mot MOTEL écrit sur le panneau lumineux. La référence au motel à l’américaine n’a jamais été évoquée par nos informateurs brésiliens. Ils ont par ailleurs établi le profil des clients de cet établissement comme suit:

- ceux qui ne disposent pas d’un lieu privé pour leurs rencontres intimes, comme les jeunes qui habitent encore chez leurs parents. Contrairement à la

France, il est très fréquent que les jeunes brésiliens ne quittent le foyer familial qu'après le mariage, ce qui leur laisse peu d'espace pour leur vie privée. Traditionnellement, le parcours vers l'indépendance d'un jeune Brésilien consiste à finir ses études universitaires, s'insérer dans le marché de travail et se marier.

- ceux qui veulent rompre avec la routine de leur vie de couple.
- ceux qui veulent garder la discrétion de leurs aventures.

6.3.3 *Perception par le public français*

Dans la scène où les bandits du Trio Tendresse prennent la voiture au motel pour s'enfuir, le public français croit qu'ils ne sont plus dans le motel, mais dans un "garage" situé dans une autre partie de la ville. De plus, les informateurs interprètent le sens du *motel* comme une maison de prostitution ou un "hôtel de passe", qui sert de façade pour la pratique de la prostitution. En réponse à nos questions, l'un de nos informateurs a affirmé que "le motel tel qu'il est connu au Brésil ne me paraît pas réellement exister en France, de façon aussi affichée, à raison des dispositions du Code Pénal relatives au proxénétisme (article 225-5 à 225-10 du Code Pénal) dont l'article 225-10"! Les autres ont tout de suite associé les images à un lieu de prostitution, notamment en raison de la présence des lumières rouges et des scènes des couples dans les chambres, sans vraiment comprendre pourquoi le mot *motel* était utilisé.

Or, le service offert par le *motel* brésilien n'est pas dissimulé car il est licite, contrairement aux maisons de prostitution, qui sont clandestines au Brésil. La traduction associée aux images a entraîné une confusion auprès du public français qui, dans sa perception, faisait une adaptation mentale des réalités brésiliennes en fonction des réalités connues en France ("hôtel de passe" ou "lieu de prostitution").

Dans les cas de neutralisation linguistique, les images ont rarement aidé dans l'accès au sens des spécificités auxquelles elles se référaient. La perception ethnocentrique semble naturelle ; souvent inconsciente, elle est à l'origine des problèmes dans la compréhension interculturelle.

Il en résulte que ce type de traduction d'un film comme *La Cité de Dieu*, profondément ancré dans l'ethno-univers brésilien, peut expliquer le manque de compréhension des spécificités référentielles brésiliennes ou les malentendus interculturels subis par le public français. A la fin du visionnage, nos informateurs français croyaient avoir une compréhension globale du film assez satisfaisante. Mais lors du test de perception, il s'est avéré que la majorité des spécificités référentielles brésiliennes n'étaient pas comprises de la même manière qu'elles l'étaient par le public de la culture de départ. Compte tenu de sa nature synthétique et de sa fonction de "béquille" au service de l'image, le sous-titrage s'est révélé la pointe d'un iceberg culturel auquel le public d'arrivée peut difficilement accéder sans un guidage.

L'étude détaillée des éléments culturels français traités linguistiquement en portugais brésilien dans la version sous-titrée du *Fabuleux destin d'Amélie Poulain* montre que la traduction brésilienne tend à conserver ces spécificités. Cela implique

que dans ce film les spécificités référentielles de l'ethno-univers français sont plus accessibles au public brésilien. Cela est particulièrement vrai pour les noms des lieux et monuments parisiens qui ont été, pour la plupart, gardés dans la graphie française.

Cependant, certaines spécificités à C.C.P. conservées sans explication entraînent parfois des ambiguïtés de sens pour le public brésilien alors que pour le public français elles sont clairement identifiées (TF1, Photomaton).

7. Conclusion

L'étude que nous avons menée concerne la question de la perception interculturelle dans le cadre du cinéma de fiction. Notre objectif consistait à analyser comment le public d'un univers culturel appréhende le sens d'un film appartenant à un autre ethno-univers par le biais du sous-titrage.

L'enquête menée auprès des informateurs brésiliens et français a permis de constater que le traitement linguistique des différences culturelles dans le sous-titrage influence la perception des spécificités culturelles d'un film étranger. En effet, lors de l'analyse des sous-titres français du film brésilien, nous avons constaté une tendance à la neutralisation linguistique – soit adaptative soit généralisatrice – des spécificités brésiliennes, ce qui empêche plutôt le public français d'accéder à ces spécificités. Quant au sous-titrage brésilien du film français, il a une tendance à conserver les spécificités françaises par traduction littérale, ce qui permet en général au public brésilien d'accéder à ces spécificités.

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Semiotics From a Psycholinguistic Perspective

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The dialogical construction of wellbeing and self care: A diatextual analysis in a cultural applied psycholinguistic perspective

1. Introduction

Wellbeing is an emerging issue in today's society. Wellbeing is a virtue that is much desired, much promoted, and much debated. Yet, as an ideal, wellbeing is not a concept set in stone. Rather, conceptualizations and experiences of wellbeing are produced in and through wider social perceptions and communicative practices. This contribution attempts to outline and analyze how people shape the meanings of wellbeing and self care in and through discourse; capturing and reproducing shared social interpretative repertoires and subjective experience. Indeed, the increasing popularity of the ideal of wellbeing appears to reflect shifts in perceptions and experiences of individual agency and responsibility. In particular, dominant discourses of wellbeing relate to changes in subjectivity; they manifest a move from subjects as citizens to subjects as consumers. Actually, the proliferation of ideas of wellbeing in this paper is related to changes in the character of subjectivity and, in particular, to the rise of an active individual as the primary agent in the creation of personal health and wellbeing.

Such perspective is attuned to with a discursive approach (HARRÉ; GILLET 1994; MININNI 1995; MININNI; MANUTI, 2005) which is aimed at underlining the flexible and negotiable nature of social meanings and experience, which are always "culturally" embedded, that is linked to an open system of resources supporting people in sense making processes (ANOLLI 2004; MANTOVANI, 2004). In this perspective, wellbeing and self care are conceived as shared interpretative repertoires, that is constellations of meanings which help to create, shape and share sense (POTTER; WETHERELL, 1987). The interpretative repertoires, as well as (or, better, more than) social representations show that what social groups know about reality is the temporary result of their encounters and negotiations.

2. Wellbeing as a cultural repertoire

Within the last decades, contemporary society has progressively affirmed itself as being characterized by the *culture of health* (BOSIO, 1991). As a matter of fact, the social representations of health and wellbeing have been significantly restructured: they have come to be seen as *ideal qualities* to which to aspire constantly, almost independently of the psycho-physical conditions of individuals, rather than as transitory *ways of being*. Actually, the post-modern sensibility, recently diffused also in psychology (MECACCI, 1999), does not define health in opposition to illness, since it does not conceive health as absence of actual pathologies. Rather, health has become a supreme cultural value, which is to be followed through behavioral options oriented toward psycho-physical wellbeing. Relevant evidence of such changes is given by the importance recently gained in Western culture by values such as physical efficiency, beauty, the ideal of a healthy and regular life (SUPER; SVERKO, 1995) and the consequent mobilization of energies aimed at the management of subjective wellbeing.

The interpretation of the topic of wellbeing means having to cope with an apparent paradox, emergent in social discourses and linked to basic human values. On the one hand, wellbeing is undoubtedly a shared social value everybody aspires to; on the other hand, for many other people it coincides with potentially threatening behaviors (alcohol abuse, smoke, food disorders, etc.). Such tension could be explained by the affirmation of alternative values which might be guidelines to orient the search for wellbeing, i.e. an individual passion for risk might legitimize potentially dangerous behaviors (BELLOTTO, 1997), or rather support unrealistic claims about subjective control over social events (ARCURI, 1996).

The psycho-social relevance of subjective wellbeing is linked to the change of the historical and cultural frames of reference which make sense of human existence. For instance, the death of the society of work, which is output of the recent restructuring of the labor market in favor of flexibility policies – enhancing subjective leisure time –, seems to make room for the “society of leisure time” based on the ideal of a “worthy and quality life” (RUIZ-QUINTANILLA; WILPERT 1991; ACCORNERO, 1999, 2000; FRACCAROLI; SARCHIELLI, 2002). Some of the most recent socio-cultural changes – from the diffusion of some touristic practices which conjugate demands for relaxation with cultural needs, to the dissemination of “wellbeing centers”, gyms and aesthetic services – do project a world view which is strongly marked by the salience of a new construct: “self care”. The “space of life” which is often left empty from a too flexible and/or from a rather invasive work experience, is obsessively filled in by several activities linked to wellbeing and self care, as a precious occasion to recover one’s self from the stressful metropolitan rhythms and to find one’s own authentic dimension again.

Self care gives a new dynamic contribution to the dichotomy of health/illness, which is traditionally linked to the relationship between individuals and society. Human

beings are generally thought to be intrinsically healthy while society is considered a vehicle of both physical and mental pathologies (HERZLICH 1969; BELLELLI, 1994). Consequently, the genesis of illnesses is often represented as a defeat in the battle between individuals/health and society/illness: the oppressive rhythms of society are harmful, and sometimes even toxic, so that individuals need to recreate themselves by running away from them. In this perspective, health and wellbeing do push towards a lifestyle which might allow individuals to preserve their own original condition (BERTINI, 1988).

3. Wellbeing as a discursive construction

The experience of wellbeing people have depends also on the way in which they talk about it, that is by the cognitive resources they enunciate as to reciprocally make sense of what they feel and/or of what they aspire to. The emphasis on the “ways to tell” as a support for the articulation of psychological constructs is a milestone of the new epistemological asset suggested by social constructivism (SHOTTER; GERGEN, 1994), which might also be resumed in the seminal formulation by Bakhtin who states that “expression comes before experience” (translated from Italian) (BAKHTIN, 1973, p. 21). If we are interested in catching the way in which human communities express “the meaning of wellbeing” we would develop a research perspective which is able to confront itself with the open challenges of discursive (HARRÉ; GILLET, 1994; MININNI, 1995) and cultural psychology (COLE, 1996).

Discursive psychology (EDWARDS; POTTER 1992) highlights the dynamic enunciation of meanings which is implied by each psychological construct, mostly if endowed with a social value (DE GRADA; BONAIUTO, 2002). Moving from such perspective, “wellbeing” is also conceivable as the output of special discursive practices, starting from the texture of meanings which is attached to words.

On the other hand, cultural psychology highlights the symbolic texture of mediation which is latent in each psychological constructs, aimed at explaining the relationship between human beings and social reality (SHWEDER, 1990). Following such premises, the construct of wellbeing is to be found in the polyphonic network of expectancies elaborated by a specific community of people. On a macro-cultural level, the topic of health and wellbeing is a privileged option, since the textual web of many communities links to it the beginning of each interpersonal interaction. A mostly diffused class of “courtesy formula” refers to the care shown for the health of the partner, meant as an interactive lubricator. Expressions such as “how are you?” and “take care of yourself” mark, respectively the opening and the concluding moments of almost any conversational script. Such norm signals a specific knot in the network of values where cultural communities reckon themselves that the interest for wellbeing and health conditions of other important people is the alpha and the omega of each “normal” interaction. The recurrence of such typology of “courtesy formula” is the indicator of a given cultural order where the members of a community conjointly find

themselves, taking for granted that a successful communicative interaction – efficient and “happy”- derives from the reciprocal ascertainment of the health condition of the other and concludes with the wish that it would be not spoiled in the future.

4. Aims of the study, corpus of data, methodology and procedure

By adopting such a theoretical framework and a qualitative methodological perspective, this contribution aims at highlighting the discursive construction of the dialogical self by focusing on the communicative practices, responsible for the subjective evaluations about psycho-physical well-being according to the expectations prescribed by the main scripts of “self care”.

More specifically, the study has addressed two main questions:

1. How do people develop their life project of subjective well-being and self care?
2. Which are the subjective and the social aspects which mostly contribute to shape such constructs?

For this purpose, the interpretative repertoires (POTTER; WETHERELL, 1987) of well-being have been investigated through the conversational elaboration of the concept given by a group of privileged witnesses of the practices of “self care”. Actually, narrative in depth interviews have been conducted with a group of customers (2 Females, 1 Male – average age 43) and operators (7 Females and 1 Male- average age 39) of some “wellness centres” in the city of Bari (Italy), so as to collect and confront peculiar aspects of wellbeing as a subjective and personal life experience which is manifested within communicative interaction.

This methodological option has been motivated by the claim that individuals shape their world and make sense of it through discourse. Therefore, the way they talk about wellbeing is very meaningful in catching the complex intrigue between identity and social context of conversation. Therefore, the discursive traces people disseminate in their daily interactions are very informative about the interlocutory scenario depicted and inhabited by them.

A diatextual framework (MININNI, 1992, 2000, 2003) was adopted to interpret the results so as to better highlight the rhetorical formats, which give consistency to the discursive construction of subjective well-being.

“Diatext” might be conceived as a pragmatic device which shows the dialectical and the dialogical dynamic intrinsic to the co-construction of meaning actualized within communicative events. Actually, sense does not reside permanently within texts (the Greek prefix ‘dia’ means through); rather it goes through them as a result of the conjunct action of its enunciators, who continuously negotiate the frame of the situation they are involved in.

In this perspective, each text might be conceived as a “diatext” as it is an open flux of meaning continuously negotiating the frame of the situation (stake) where interlocutors are actively involved.

From a pragmatic point of view, diatexts reveal themselves through a series of markers which point out the *Subjectivity*, the *Argumentation* and the *Modality* of discourses and thus catch the meaning within the dynamic of reciprocal co-construction of text and context of enunciation. Then, the interpretative procedures of a diatextual analysis are guided by three kind of discursive traces, accounting for the complexity of the project of meaning pursued by the interlocutors:

1. The traces of *intentional agentivity* (i.e. agentivity markers, affectivity markers, embrayage/debrayage markers, etc.) revealing the action choice realized through the texts (what do the interlocutors do while understanding/saying/interacting?);
2. The traces of *modality* (i.e. meta-discursive markers, discourse genre markers, rhetorical figures, frame metaphors, etc.) revealing the cognitive asset and the emotional experience which emerges from the texts (how do the interlocutors think and feel?);
3. The traces of *rhetorical options* (i.e. “stake/enjeu” markers, narrative markers, the network of logoi and antilogoi, etc.) allow underlining the stake of communication as shaped by the texts (how is the interlocutionary relationship constructed?).

Diatextual analysis is a proposal for a “subjective” interpretation, since the analysed text links the subjectivity of the researcher to the subjectivity of enunciators. Actually, subjectivity in the methodological practice of diatextual research is also congruent with the aim of investigating the presence of other “subjective” voices within the corpus that is the identity positioning that the text realizes for the interlocutors it meets. In this sense, the text is like a mirror, since it shows who the enunciators are and how they act in it.

The present contribution is aimed at showing only some of the procedures of the diatextual approach that are those with a greater discursive pertinence.

5. Data analysis: The culture of wellbeing and self-care in discursive interaction

The first result manifested through data analysis refers to the emergence of two different interpretative repertoires of wellbeing and self-care respectively mirrored into two enunciative positions: the expert knowledge (i.e. professional operators) and the naïve knowledge (i.e. customers).

The analysis of the discursive corpus highlights that operators are more available than customers to tell their own stories about wellbeing and self care. Such evidence confirms the existence of two “cultures” that is of two discursive modalities to make sense of the virtuous circle “health-wellbeing-self care” respectively linked to the customer and to the operator.

The most radical difference between the “expert/operator culture” and the “customer/profane culture” passes through the definition of the enunciative position: “polyphonic/complex” for the operator who though his/her work supplies wellbeing,

“reductive/simple” for the customer who looks for wellbeing experience. The different perspective given to the informants by their anchorage to the economic law of demand and supply implies the adoption of very different “ways to tell” wellbeing. According to the naïve interpretation of wellbeing, given by customers, such experience is depicted as an ideal state, as a goal through which to orient one’s own behavior. Therefore, the conditions as well as the expedients (i.e. fitness and healthy food fully represented by the media texts) are largely generalized¹.

- (1) “Well-being means to feel::: good with one’s own self, to accept ourselves the way we are” (wellness centre’s customer)

The most salient trait which marks the discourses is the tendency to “psychologize” and to enhance the emotional consistency of their personal experience of wellbeing as a “condition”, which is stable at least at the level of actual feelings.

- (2) “Well-being is (0.1) a peace of mind and psychological serenity” (wellness centre’s customer).

Such “reductionist” enunciative profile is in contrast with the one expressed by the operators, who on the other hand underline the specificity of a subjective view of wellbeing which adapts itself to the actual personal needs.

- (3) “Well-being certainly might be a different thing for each of us (0.2) each of us:: might find his/her wellbeing into a specific thing (0.4) for me wellbeing is a walk on the sea for another people it might be to lay down and to read a book:::” (wellness centre’s operator)

More than to emphasize the variability of wellbeing experiences, the expert tends to mark his/her detachment from any naïve thinking by explicitly criticizing mass society and mass media representations, as they foster and support superficial and banal patterns of wellbeing, making sense of naïve knowledge.

- (4) “The youngest people come here to the gym without caring about the psychological well-being (0.2) naturally deriving from physical activity (0.2) They simply come here to try::: to look like movie and TV stars (.) Therefore, they absolutely deny their own physical aspect” (wellness centre’s operator).

The critical position of the operators concentrates on a naïve interpretation of wellbeing as appearance rather than as a way of being and as a desire to emulate

¹ Extracts transcription follows the conventions prescribed by conversation analysis (SACKS; SCHEGLOFF; JEFFERSON, 1974)

social patterns. The main diatextual traces of such an enunciative strategy are the *modality indexes*, that is all those expressions which display what the enunciators think and feel about the topic investigated. Very often the speakers use impersonal pronouns (i.e. “everyone”, “all”) or abstract categories (i.e. “women”, “people”) as to mark one’s own distance with the naïve interpretative modalities making sense of wellbeing. Such an argumentative option aims at redeeming the construction of the social meaning attributed to one’s own personal experience and to split up the consent on the vision of wellbeing expressed (personal/impersonal anchoring).

- (5) “Everyone chooses what makes him/her feeling better (.) again it is a PSYCHOLOGICAL QUESTION then there is always the desire::: to look like the others::: to be handsome as the others are::: therefore sometimes people take care of one’s own self to show to the others:: to demonstrate that even we:: are able to become handsomer” (wellness centre’s operator)

Probably this is the most direct effect of the social relevance recently attributed to these topics in the public agenda. The discursive construction of subjective experience loses its credibility, if not linked to a social representation of wellbeing, which owes more to definite boundaries. Once passed the loose borders between the culture of the expert and the culture of the profane, both cultures seem to feed themselves from the same interpretative repertoires of wellbeing. The first highlights the salience of “being in shape” as an overcoming of the “fitness model”. Such repertoire revolves around images of wellbeing and self care which recall physical exercise and their evident effects in terms of appearance, but show the necessity of a more organic vision. The most typical stylistic element of such a discursive model is made up of words such as “body”, “physical aspect”, “relax”, so as to underline the tight relationship between physical wellbeing and psychological wellbeing. Such repertoire finds its widest amplification in the diatexts diffused by the press.

- (6) “Wellbeing is a (.) STATE OF PEACE AND SERENITY BOTH PSYCHOLOGICALLY AND PHYSICALLY then:: WE NEED BOTH PHYSICALLY AND PSYCHOLOGICALLY::: both things must be integrated (.) the one cannot be conceived without the other” (wellness centre’s customer)

The global discursive act which better synthesizes the value of this repertoire is to “advise”, since the physical exercise and self care are described as behaviors which might give immediate wellbeing and release from the daily stress, thus allowing one to live better with one’s self and with others. As a consequence, the frame metaphor which better represents the fitness model is wellbeing as a relief valve.

- (7) “ANYWAY::: I care for my body (0.3) as long as I can:: I try to practice sport and:: to have a nice physical aspect since if I have a nice aspect I feel better” (wellness center’s operator)

People interviewed in the “wellbeing centre” give voice mostly to a second repertoire which highlights the psychological salience of wellbeing as an “inner peace” (ego model). Such repertoire organizes itself around the dynamics of “satisfaction/non satisfaction” and of “control of one’s own existence”. Non satisfaction might be physical, as in the case of a difficult acceptance of one’s own body, as well as psychological, whenever caused by a very heavy work load or by the daily difficulties of personal life. In both cases, the search for wellbeing as a state of ideal fulfillment becomes the answer to finding serenity again and to feel fully in control of one’s own existence.

Self care derives from the degree of development of personal emotional intelligence which helps individuals cope with any basic fear: to die, to grow old, to lose energies/ beauty/ readiness etc. This coping ability contributes to switching a special habit which attempts to exploit any little resource of logic, and also the vicious circle of tautology, so as to justify one’s own good practices.

- (8) “Wellbeing means ONLY to feel good with one’s self (0.1) therefore to like one’s self to feel good with one’s self THEN IS LIKE A DOG BITING ITS TAIL::: if you feel good with yourself you take care of yourself (.) if you do not feel good with yourself by taking care of yourself you will finally succeed in feeling good with yourself” (wellness center’s operators)

Actually, the desire to have more time to spend taking care of one’s self is one of the most frequent definitions of “self-care”, which reveals itself through the specific *traces of intentionality* that people disseminate in order to signal their option for actions. In this case, the global discursive act which keeps in itself the meaning people attach to wellbeing is “to suggest”: to take care of one’s self is a very difficult as well as intriguing task, which needs engagement and organization. Through the narrative of their own personal experience, operators and customers suggest their *recipe* for wellbeing, give advice and suggest the right ingredients so as to have the desired output. The frame metaphor is that of the *recipe*, therefore the most recurrent stylistic element in this repertoire is according to the best cooking practices “a little bit” (a little bit of time, a little bit of room, a little bit of attention, etc.):

- (10) “Concretely I take care of myself with little gestures as for example drinking an infusion, taking a bath with a special foam so I spoil myself” “ (wellness centre’s operator)
- (11) “To take care of one’s own self means to make a little room for ourselves” (wellness centre’s operator)
- (12) “to take care of one’s self means first of all TO TAKE CARE OF ONE’S OWN BODY, TO ACKNOWLEDGE ONE’S OWN FAULTS::: since everyone has defects ACKNOWLEDGE ALSO ONE’S OWN HEALTH CONDITION

AND CURE THEM FOR THE BEST:: first of all by practicing sport which is always good (.) a little bit of fitness and a healthy lifestyle” (wellness centre’s operator)

This repertoire interprets wellbeing as a search for cuddles, as a manifestation of the love we feel for ourselves, thus exalting the sensorial (and sensual) base of self-care. In this perspective, wellbeing looks like a plant which needs to be watered constantly, so as to avoid external forces (work, family, problems of daily life, etc.) which would challenge its existence.

- (9) “to take care of one’s self means::: to CUDDLE ONE’S SELF (0.2) a massage is a cuddle dedicated to one’s self (.) CONCRETELY (.) I take care of myself in small things (.) as for instance I drink a cup of tea::: I take a bath with a special relaxing balm::: (.) WHENEVER I CAN (.) I lay down in my bath and I cuddle myself a little bit (wellness center’s operator)
- (10) “For me wellbeing is::: the word says it:: it is to feel good and to love one’s self:: to take a distance from the world and to rely on trustworthy and expert hands (.) as for instance hairdresser:: or beautician::: or massage::: (.) this means to be cuddled (.) IT IS A MOSTLY PSYCHOLOGICAL SENSATION (.) SINCE if you are ok with your head:: then it is also visible outside and you are willing to cure yourself” (wellness centre’s operator)
- (11) “To take care of one’s self means::: TO LOVE ONE’S SELF FOR EVER AND EVER” (wellness centre’s customer)

Within this repertoire the aspiration toward wellbeing owes also a cathartic function since the intimacy developed in the beauty centre with the operator might favor *self-disclosure* and the storytelling of one’s own private experiences. It is as if time dedicated to self-care would stop the frenetic rhythm of daily life thus facilitating communication and interaction.

- (12) “When I am in a cabin:: I feel like a psychologist (.) SINCE THEY RELIEVE THEIR FEELINGS AND TALK ABOUT MANY DIFFERENT THINGS (.) then (.) you understand their uneasiness:: people often experience difficult situations and::: they do not have the ability to cope with them or they haven’t metabolized their life stories yet::: (0.2) I listen to them, I give them advice:::” (wellness center’s operator)
- (13) “many customers who come here talk and::: open their hearts::: with the beauty experts and/or with the hair dressers:::” (wellness center’s operator)

Finally, the third repertoire is the one focused on the psycho-physical salience of “harmony” and organizes itself around the thematic nucleus of “synthesis/integration”

and of “balance” (irenic model). For some aspects, this repertoire crosses itself with the ego model since it interprets wellbeing as an ideal point of balance that overcomes the distinction between physical and mental and integrates both dimensions of wellbeing. Nonetheless, the point of distinction is the recurrent style, which recalls an “inner experience”.

- (14) “According to me wellbeing is TO WORK AS TO FEEL GOOD BOTH PHYSICALLY AND PSYCHOLOGICALLY (0.1) means::: TO REACH AN OPTIMAL STATE (.) Both from physical and inner point of view (.) wellbeing is that pleasant sensation we gain by being on one’s own (.) wellbeing is to live in harmony with one’s self and to experience positive relationships with the others (0.2) THEN IT IS ALSO HEALTH THAT IS TO FEEL GOOD PHYSICALLY since obviously this dimension comes first of all” (wellness center’s operator)

This repertoire describes an ideal world, so that the interlocutor tends to contrast the impression of randomness or of unreality with modalization which mark the claim of “obviousness” and/or “security”.

- (15) “to feel good means::: to be willing to smile (.) to enjoy life with serenity (.) to feel peaceful:: to experience a peace of mind which allows to life everything that happens differently (.) IF ONE STARTS FROM A STATE OF SERENITY AND TRANQUILLITY:: surely (.) each issue might be solved more rapidly and with a better result” (wellness center’s operator)

The “inner” condition of serenity and tranquility is a counterbalance to “external” turbulences, which is translated into a benefic sensation of “balance”.

- (16) “Wellbeing::: I believe that everything depends from an inner balance (.) if you have this inner balance then::: you accept your physical aspect (.) you accept your social condition::: then BALANCE AND ACCEPTANCE OF WHAT YOU ARE AND DO” (wellness center’s operators)

Those who experience difficulty in managing the vital dynamic of the inside/outside the self relationship might attempt to overcome their own impasse through a sort of *acting out* that happens in the protected context of the wellness centre. Such healthy sensation of serenity that people cannot find “inside themselves” might be sought “inside” a place called “wellbeing”.

- (17) “In this centre wellbeing:: IS A PLACE WHERE YOU COME IN AND LEAVE THE WORLD OUTSIDE THE DOOR (.) YOU LEAVE YOUR MOBILE (.) LEAVE YOUR WATCH (.) YOU LEAVE YOUR PROBLEMS (0.1) THEREFORE to find a form of wellbeing with the self first of all (.) to look inside the self (.) as to find out serenity again ” (wellness center’s operators)

In this case, a recurrent global discursive act is “to wish”: wellbeing becomes a wished and desired dimension, which contrasts with the frenetic rhythms of daily life. As a consequence, the frame metaphor is the *oasis*, which is a space which is distant from everything and everyone, where one might relieve one’s self and finally dedicate to one’s self.

- (14) “Therefore according to me well-being means to find a small oasis where to find a shelter and to regain energy” (wellness centre’s operator)

The analogy of the “oasis” is perfect to evoke a world rich in vital and significant meanings: the freshness of the water, the warmth of the sun, the adventurous nature of travel, the sense of exoticism and mysteriousness. Another very interesting analogy, that of the “cuddle”, invites the interpretation of the expression “to love one’s self” in a more reflexive sense which is linked to time management. Then, the most recurrent stylistic element in this case is the resistance to the passing of time.

- (15) “To take care of one’s own self means to have time for the self, we have plenty of time for many things but rarely for ourselves we must find this time” (wellness centre’s operator)

6. Concluding remarks

The psychology of subjective wellbeing postulates individuals who are able to manifest their thought on the “totality of their experience under every point of view” (ANOLLI, 2004, p. 310). Such hypothesis derives from the necessity to contrast with the excessive focalization of psychology on any pathological phenomena and on the relative processes of cure of uneasiness, but also from the abstract definition of health as “absence of illnesses”. The attention required for subjective wellbeing is a specific articulation of a wider project aiming at orienting the psychological knowledge toward the exploration and the enhancement of human potential.

The construct of “subjective wellbeing” makes reference to the expressive synthesis of a global experience; it is a glance, a “scenic view” made up of by several varieties of situational snapshots retrievable in memory. Moreover, within such construct different ideas of “completeness/fullness”, “decomposability of differences”, “harmony” actually converge.

The analysis of the meanings inside the virtual cycle of health, well-being and self-care shows a network of cognitive nodes which might be active in different communicative events.

This network is made up of processes of reciprocal and dialogical penetration between different cultures of well-being, health and self-care.

The investigation of different cultural frames of reference (expert/profane knowledge) has allowed the highlighting of the existence of three distinct interpretative

repertoires of well-being (fitness, ego and irenic model) and the ways through which they cross each other within discourse.

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A semiotic approach to compare and contrast signed versus spoken language

1. Introduction

In this paper I will compare and contrast sign language (used by the deaf community) versus spoken language from the point of view of semiotics and linguistics (TOBIN, 1990, 1994). Both sign and spoken languages can be defined as: A system of systems – revolving around the notion of the linguistic sign – used by human beings to communicate. Both languages also share a common purpose and goal: to achieve maximum communication with minimal effort. Where they differ, however, is in the way that they create the meaningful signs they use to fulfill this goal of creating an efficient system of communication. Spoken language is based on the concept of sounds which are in opposition to each other – as phonemes – which are arbitrary and possess no meaning of their own – but combine into larger meaningful units such as morphemes, words, etc. Thus spoken language is fundamentally *auditory* and *arbitrary* (TOBIN, 1997). Sign language, on the other hand, is based on a combination of hand-shapes and gestures which have an orientation and movement to various parts of the body – which not only possess meaning – but are iconic rather than arbitrary in nature. Thus sign language is fundamentally *visual* – rather than auditory – and *iconic* – rather than arbitrary. It is our contention that the traditional concepts of spoken language are therefore not always appropriate as a means to analyze sign language and a different approach to analyze sign language will be suggested in this paper.

Israeli Sign Language (ISL) is a relatively young language that was developed in Israel in the 1930s, parallel to the development of the deaf community in the former British Mandate of Palestine, or what is today the State of Israel. ISL, like other sign languages in the world, is produced manually (with the hands) and perceived visually (with the eyes). The hand is primarily composed of bones and joints. Physiologically, this anatomical structure and its accompanying flexibility allow the hands to create different geometrical shapes and to move in space in alternative ways and in various directions with diverse orientations. The eyes are capable of perceiving several stimuli simultaneously: hand shapes, hand movements, hand-movement orientations and facial expressions. This variable manual flexibility paired with complex and multifarious visual perception are important tools for the creation of signs inherently based on (metonymic) iconic analogies that are indeed exploited for this explicit purpose by users of sign language. These metaphorical, metonymical analogies are created by the choice of a specific image that represents the entire concept. Each language

chooses the specific image that can be representative of the larger concept within the medium of communication that it uses: “*kukuriku*” for example, is the acoustic image of the rooster in Hebrew while the rooster’s crest is the visual image in Israeli Sign Language.

All the sign languages that have been studied (in the world) have been defined as natural – but iconic – languages. Signers throughout the world exploit the unique features of the communication channel to create analogies for phenomena that are found outside the reality of language. However the lexical signs of sign languages differ from each other on the level of their motivation and the type of iconicity they portray. Some of the signs are direct, obvious, mimetic pictures, for example – in the sign for bird – the index finger and the thumb represent the beak – a mimetic picture). Others are indirect iconic signs that are only semi-transparent, for example – in the sign for economics – the shape of the hand in the sign is the iconic of parallel of the form for handling bills of cash and the partial rounding of the hands is the metaphorical equivalent of “merchants exchanging cash”. There are also signs that have been classified in the literature as “opaque – not transparent signs” because it is more difficult to detect their iconicity: i.e. the iconic elements do not give direct clues to the abstract elements of the concept. For example – in the sign for “mistake” – the palms of both hands face the shoulders – the hands change places – the pinkie and the thumb remain straight and the other finger are bent – it is the “crossing” of the hands with the straight+bent hand shape that clues a “mistake” – one possibility in the place of another. The strong presence of obvious and transparent iconicity in the signs found across sign languages led to the unfortunate fact that until the late seventies, the full linguistic status of sign languages remained in doubt in the literature. Until the end of the seventies, American Sign Language (ASL) was considered by many educators and by the hearing community alike as a mere pantomimic language of gestures.

The 1960s and 1970s became an important turning point in the research of sign languages. At this time a number of research centers in the United States showed that the lexical sign in sign languages was controlled by linguistic laws in the same way as lexical signs in spoken languages. The classic studies of Stokoe (1960/1993) were the first indicators of this trend. His research showed that the lexical sign in sign language was more than a mere pantomimic gesture, but rather a complex structure composed of a number of parameters (hand shape, orientation, location and movement) which are joined together according to internal syntagmatic and combinatory rules. Thus, through this new revelation, the researchers persuaded the hearing community that sign language was indeed a bona fide natural language in every sense of the word and in all of its aspects

Ironically, however, the research perspective on iconicity marched in opposite directions in the fields of sign language versus spoken language. Even though it was openly recognized that linguistic iconicity also existed in spoken languages and was exploited as an economic and efficient tool to support and induce memory, a great

deal of effort was invested by generative grammarians to show that iconicity played no role in sign language, and they further claimed and supposedly “showed” that iconicity did not provide an advantage to the language acquisition of deaf children (KANTOR 1980; NEWPORT; MEIER 1987).

The search for universal phonological features led the same linguists to adopt all the concepts, tools and tests available at the time for phonological research in spoken languages to sign language. The parameters for sign language (hand shape, location, movement and orientation) were described in terms of their distinctive articulatory and visual features. The test for minimal pairs used to discover phonemes in spoken language was adopted (by the definition of *noblesse oblige*) to the study of sign language phonology in order to determine which features [of arbitrary abstract phonemes] were “distinctive” and created differences in meaning and which features were “secondary” or allophonic and did not change meaning.

Despite this, the few studies that studied the influence of iconicity on the phonology of sign languages revealed that what suited the phonology of an arbitrary language, or on a spoken language grounded in arbitrariness, was not necessarily suitable for a figurative language, or a language based on figurative iconicity. In spoken language, the phonemes are arbitrary, and their distinctive features signal “mere otherness”. Alternatively, Boyes-Bream (1981) showed that hand shape in ASL had a specific iconic meaning that influenced its distribution in the lexicon. For example, arched hand shapes always appear in lexical items that refer to entities that are either visually arched-shaped or round: a glass/cup, a grapefruit, an egg). Boyes-Bream claimed that the articulatory and visual features were not sufficient to describe hand shape, and therefore she added another dimension of features that were essentially more semantic-perceptual: grasping. linearity (1990) reported that in British Sign Language (BSL) not only did the feature of hand shape have iconic or metaphorical meaning, but so did all the other parameters of the lexical sign. For example, their location on the body such as: the temple and the heart, are almost always perceptually connected with intelligence and feelings, respectively, and tend to appear in lexical signs related to, or associated with these areas. Brennan further showed that users of BSL exploit the isomorphism that exists between the phonemic and the morphemic levels in order to create new signs and/or to make creative additions on already existing signs. For Brennan, the sign in sign language is the comprehension of the cognitive reality. The ways in which signers exploit the morphophonemic units to produce new metaphors and signs in the language reflect the ways in which they perceive and interpret the world.

Van der Kooij (2002) who researched the structure of Dutch Sign Language (DSL) also claimed that the “phonological” parameters of the lexical sign in DSL are not without meaning. More importantly, and contrary to the popularly held claim that iconicity did not influence the deep phonological rules of the lexical sign, van der Kooij found that iconic motivation neutralized phonological rules: e.g., the possibility of dropping the use of the second hand in symmetrical signs.

Despite all of the above, most of all phonological research on sign language was, and still is influenced by the idea that language is composed of independent and autonomous levels prevalent in formal generative and other linguistic approaches. This view includes the idea that the fundamental impact of iconicity in sign language is dwarfed by phonological rules and the building blocks of lexical signs are without meaning like the phoneme, the arbitrary building blocks of the lexeme in spoken language (SANDLER; LILO-MARTIN, 2006).

The present research presents an alternative theoretical and methodological framework of phonology to analyze the structure of ISL: the semiotic or sign-oriented linguistic approach which includes the theory of Phonology as Human Behavior (PHB) developed by William Diver (1979) and applied to the speech and hearing clinic by Yishai Tobin (1997) of the Columbia School (CS) (TOBIN, 1990, 1993, 1994). The sign-oriented approach is based on the integrity of the linguistic sign where form and meaning are interlocked together, and, therefore this approach is holistic in its point of view, and rejects the idea of separate and autonomous linguistic levels inherent in other theories. Thus, this approach is especially suitable for the study of sign language where, as we claim, the fundamental unit of language is the sign which integrally combines a visual signal and a meaning. Furthermore, because the basic unit in sign language is visual, it makes sense that the role of iconicity, which economically and efficiently connects form and meaning, will dominate the use of sign language. Further research along these theoretical and methodological lines of research can be found in Fuks (2008, 2009), Fuks and Tobin (2008, 2009a, 2009b) Tobin (2007a, b, 2008, 2009).

2. Research Methodology

A stratified sample was randomly selected from the index of the Dictionary of ISL. A random stratified sample preserves the relative weight of the various content word classes in the dictionary and also assures that even the smallest category will have at least 50 lexical signs. A minimum of lexical signs even for the smallest category assures the possibility of carrying out quantitative statistic analyses which will be significant within and across all lexical categories. As a result of this, the category of noun includes 356 lexical signs, the category of action words includes 96 lexical signs, the general category includes 57 lexical signs and the category for features includes 51 lexical signs. The total number of lexical signs in the random stratified sample in our research is 560 lexical signs.

An adult deaf male, the son of two deaf parents, whose native language is ISL, was asked to sign the lexical signs in the sample which was then recorded and filmed on video. The Liddle and Johnson phonetic transcription system which has been used to transcribe sign languages throughout the world was used as the basis of the transcription of the internal structure of the lexical signs in our study. Three deaf advisers, the children of deaf parents, whose native language is ISL, accompanied our research and aided us with various content questions.

3. Results

1. All of the parameters of the lexical sign in ISL have meaning.
2. The distribution of the sub-parameters in the lexicon was not random but rather motivated by the iconic meanings connected to them. The following are examples of the metaphoric iconic motivation of lexical units:

Examples:

A. Hand Shape

Hand Shape 1. (fist)

Meaning: Firm

- 1.1 Firm GRASP: this hand shape appears in signs that represent their parameters through firm GRASPING: pot, motorcycle, row boat, suitcase, car, clothes iron.
- 1.2 This hand shape is exploited for passing on a metaphorical message of power/strength/stability in signs: religion, (government, synagogue, official, security, certainty, support, strong, work, democracy.
- 1.3 This hand shape is used to express a metaphorical message of “hardness/difficulty” (Firm=Hard): to make difficult/difficult, regret, sadness, miserable, poor, complain, stubborn, stupid.

Hand Shape: C

Meaning: Arch-like

1. This is an iconic hand shape with a very specific meaning that appears only in lexical signs that represent referents with arch-shaped visual features: egg, lemon, tomato, flashlight, banana, bag of cocoa, a person who talks a lot (the hand shape represents the mouth).

Hand Shape: 4 (“paying”)

Meaning: Functional holding

- This hand shape is extremely problematic for traditional linguists because it has a highly marked structure but it also appears very frequently in sign languages throughout the world (because of its functional iconic meaning).
- In all of the lexical signs in which this hand shape appears it represents “holding on to something”:
 - Gardener = holding tools
 - Tennis = holding the racquet
 - Tear = holding a piece of paper
 - Brush = holding a brush
 - Money – holding a bill. In ISL as in other sign languages in the world a whole paradigm of lexical items related to “money” has developed around the image of holding a bill: buy, sell, be extravagant waste money, cash, economy, sell, expensive. The common denominator for all of these lexical

items is the appearance of hand shape: T representing the image of holding on to a bill of paper money.

B. Locations

An iconic meaning that motivates the distribution of the feature of Locations was found in ISL just as it was for the feature of hand shape. The following are a few examples:

1. The temple
Meaning: Representing mental activities:
remember, know/not know, idea, invent, dream, learn, forget, think, worry, genius
2. mouth/ears/eyes
Meaning: Sensory activities:
mouth: eating and communication:
eat, Swallow, vomit, say/tell, ask, answer/respond, reply, communication
Eyes: look, criticize, cry
Ears: deaf, hear, noise, hearing loss, telephone
3. torso – Locus of Emotional and individual experience
Love, happiness, become excited, be insulted, want, regret, hurt, be patient, comfort/feel comfortable, alone

C. Path Movement

Movement and its associated features like location and hand shape were also found to have meaning in our study.

Direction of Movement: Each direction of the movement of the hand in space had a different specific meaning e.g.:

- 1.1 Upward Movement – Up Is Good-promotion, rehabilitation, director, new, education, success
- 1.2 Downward Movement: Down is Bad – failure, loss, lazy, weak, rude, inferior,
2. The Shape of the Movement
- 2.1 Convex Arch – meaning: passage to, passing X over
to pass, wander, postpone, beginning, to/towards. . . , next year, ask, help, give
- 2.2 Repeated Circular Movement – meaning: an activity which lasts a long time or a continuing situation look for, lonely/isolated, nothing, lecture, tradition, trips, arrangements, used, complicated

4. Additional Results

1. Iconicity was responsible for the appearance of irregular hand shapes and locations that cannot be represented or described by means of the standard features of the language. The appearance of irregular units is generally limited to one or two lexical signs.

For example, location – lateral space near the arm pit. An infrequently used location that appears only in two signs: to gossip and to steal. The location also receives the meaning of “from the side/behind one’s back” on the semiotic level.

2. These irregular features are problematic for traditional linguists who have to deal with the questions: How should one explain these irregular units? and Should the phonological be able to represent them? The traditional generative phonological model could not adopt specific features to explain each irregularity individually.

3. In abstract lexical signs basic units with a wide and neutral iconic meaning were generally used. Units with very specific iconic meanings like the various arch shapes never appeared in abstract lexical signs.

4. Iconicity was more dominant than the human factor (ease of production) for explaining the phenomenon of specific units such as: B-Bent.

There is disagreement regarding the status of the hand shape B-Bent in the literature. Some researchers (such as van der Kooji 2002) claim that it is a phonetic allophone of the hand shape B, that appears in phonetic articulatory environments where the wrist joints at the root of the palm of the hand has to be bent. The argument is that instead of bending the wrist joints that requires much effort, the bending is passed on to the first knuckle of the fingers (Metacarpophalangeal joints). Alternatively, there are other researchers (such as PIZZUTO *et al.* 1995) who claim that this hand shape has a more narrow and specific meaning than the hand shape B and it is: the marking of boundaries or delimitations and our research supports this latter claim: in 50% of cases where this hand shape appeared it outlined boundaries: amount, a raise/rise, a storey/floor, tall/high, early/late, proceed, expand, make smaller. In 20% of the cases this hand shape iconically represented the visual appearance of the lexical referent (e.g., camel). In the remaining 30%/of the cases one can explain the appearance of the B-Bent hand shape by the human factor as an attempt to limit the bending of the wrist joints which is more difficult than to bend than the knuckle.

The appearance of the hand shape B-Bent also appeared in phonetic environments where according to the hypothesis of “allophones” it should not have appeared since the bending of the wrist joints was not required: In the lateral dimension (right – left). Finally, a minimal pair was found for the hand shape B versus the hand shape B-Bent for the signs: wide/expansion and tall (high) / terrible. We have further elaborated upon the hand shape B-Bent in Fuks and Tobin (2008).

5. Summary and Conclusions

The results of our research reject the separation of semantics and phonology in ISL. Iconicity is the basis for all aspects of ISL including phonology. Arbitrariness, on the other hand, is used only in those cases when iconicity – direct or indirect metaphoric – cannot be used to describe the characteristics of the abstract concept. Paradoxically speaking, in the tension between arbitrariness and iconicity sign language is quite

similar to spoken language. In both cases the human factor is striving for maximum economy and minimal effort:

Spoken language strives for maximum communication with minimal effort through the auditory channel –through hearing – thus, arbitrariness reigns supreme in spoken language. Sign language, on the other hand strives for maximum communication with minimal effort through the visual channel – through sight – thus, iconicity reigns supreme in sign language. The synergetic principle for the search for maximum communication with minimal effort is the common denominator for both language systems and it is the different channel of communication which provides the source for their individual preference for either arbitrariness or iconicity.

Linguistic research in sign language has to pay more attention to the influence of the channel of communication to the structure of the language. Instead of using theoretical and methodological tools adopted from an arbitrary auditory based system that only partially contributes to understand the linguistic phenomena, research in sign language should develop tools that are more suitable for a visual language. In the last few years more research has reported that the iconic meanings of the basic units of sign language are psychologically real for language signers and these iconic meanings are used to productively produce new metaphorical signs in the lexicon.

This means that signers are aware of the basic iconic meanings of the various components of the sign and exploit them when constructing new signs (especially in abstract signs where they create metaphorical parallels between the concrete iconic meaning of the unit and the metaphorical meaning: for example, in the sign for “informing” the hand shape is composed of all the fingers that are bent and touch the tip of the thumb. Iconically, this hand shape directly indicates grasping or having something at the tip of your fingers. Therefore the sign for “informing” implies the metaphoric message that ideas-information-thoughts- knowledge are objects that can be grasped or held on to physically and passed on to others. Today there are researchers like Taub (2001) who analyze the iconicity of sign language and the metaphoric use of the basic units of the sign in the theoretical framework that began with Lakoff and Johnson (1980) in metaphor and cognitive linguistics. Future research that will further increase our knowledge on the metaphorical exploitation of basic units in the process of building new signs will even further contribute to our understanding of how a visual language is realized in space.

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Psycholinguistics and Mass Media

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The language of academic weblogs: How personality is projected and perceived

1. Introduction

According to Blood (2002), weblogs or blogs radically created the first native form of discourse on the Internet which contributes to discussing all sorts of issues in a worldwide *public* sphere or blogosphere. In this rapidly-expanding internet community, which has a socially-transformative democratizing potential (HERRING *et al.*, 2004), blogs are mainly created as dynamic Internet journals and diaries for commercial and journalistic purposes. However, they appear to be used also for personal and educational reasons. The popularity of blogging is due to its democratic expression of publishing opinions in an open interactive architecture, whereby texts are posted, read and commented on by anyone with Internet connection. This revolutionary openness differentiates blogs from other types of asynchronous technological tools (e.g. listservs). Regardless of social status, blogs allow expression to be freed from traditional gatekeepers such as local authoritative power at very low costs. Thus, blogging can be considered as “the art of turning one’s own filter on news and the world into something others might want to read, link to, and write about” (FLEISHMAN, 2002, p. 107). Furthermore, while other forms of computer-mediated-communication (e.g. websites, listservs, hypertexts) are framed around specific topics, blogs are basically identified with their author(s), thus placing authorship at the forefront of online discourse.

Moreover, a number of attempts have been made to typify blogs. Herring *et al.* (*op. cit.*) categorize blogs as *filters* (based on the author’s interests and opinions), *knowledge logs* (based on external topic information and observations) and *personal journals*, which are individually authored. Krishnamurthy (2002) classifies blogs along two dimensions: *personal* versus *topical*, and *individual* versus *community*. Currently, three main types of weblogs have been identified, namely, *news*, *commentary*, and *journal*. News and commentary weblogs tend to respectively catalogue news from various sources on particular topics and to make focused comments on outside material (e.g. technological and political weblogs, celebrity gossip). On the other hand, journal weblogs are on-line diary expressions of personal reflections, opinions and ideas, often

shared anonymously in the public sphere. Although their frequent appearance in the mainstream media is increasingly witnessed, it is not just the media for whom weblogs are becoming common place. In academia, they are beginning to be embraced both as an instrument and object of research (MORTENSEN; WALKER, 2002). These types of weblogs, which are positioned outside the mainstream media, have, however, not yet received noteworthy attention.

This paper is based on a research study conducted on a *topical community* weblog (KRISHNAMURTHY, *op. cit.*). The study design is based on the pivotal assumption that the language of computer-mediated communication is able to project personality traits (GILL, 2004). Thus, the aim of the study is twofold: 1. to verify how personality is projected linguistically in a topical community weblog created for academic purposes; 2. to test whether personality traits can be perceived and correlated to specific language behaviour in this type of weblog. A trait approach to personality, based on the five-factor model (COSTA; McCRAE, 1992), is employed in the study. Indeed, assuming that individuals have stable personality characteristics (CLONINGER, 1996), personality factors such as Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness have shown validity after replication (FUNDER, 2001). Therefore, in order to obtain information about scores on single personality factors, Buchanan's (2001) IPIP Five Factor Personality Inventory was administered to a group of student teachers, acting as bloggers. Scores on these factors have shown to correlate with some aspects of language use (DEWAELE; FURNHAM, 1999). In the present study a corpus-based data-driven approach is introduced to analyze the language of the topical community weblog, and to pursue the aforementioned aims.

The paper first provides an overview of the relationship between language and personality, and then presents the research study, discusses its main findings, and draws some conclusions.

3. Language and Personality

Systematic differences in individual communicative styles can be attributed, amongst other things, to *personality traits* or stable affective properties. Two models are referred to by leading trait theories to investigate personality in terms of essential *traits* or *factors*: Eysenck's three-factor model (EYSENCK *et al.*, 1985; EYSENCK; EYSENCK, 1991), Costa and McCrae's five-factor model (COSTA; McCRAE, 1992). Both models share the trait approach, whereby personality is measured on a number of quantifiable traits or factors. Single factors are seen as orthogonal and independent scales which provide a range of possible scores from "low" to "high". Two core traits are common to both models, namely, *Extraversion* (degrees of outgoingness and assertiveness) and *Neuroticism* (degrees of anxiousness and self-consciousness). Studies on the observation of language use as it relates to the exhibition of personality traits have been mainly carried out on Extraversion and, to a less extent, on Neuroticism. Much of the research conducted on personality and language has mostly correlated

Extraversion to conversational behaviour (e.g. McCROSKEY; RICHMOND, 1990), to speech fluency in both formal and informal situations, and to syntactic tokens (e.g. DEWAELE; FURNHAM, 2000).

It has been argued, however, that five factors need to be taken into account (McCRAE; COSTA, 1997) in order to have a full description of personality. Thus, while Eysenck focuses on the three factors of psychoticism¹, extraversion and neuroticism (P-E-N model), Costa and McCrae's five-factor model (OCEAN model) includes:

- *Openness* to experience which describes a dimension of personality that distinguishes imaginative, creative people from down-to-earth, conventional people;
- *Conscientiousness* which describes a dimension of personality concerned with the way in which we control, regulate, and direct our impulses;
- *Extraversion* which describes a dimension of personality which marks our level of engagement with the external world (Extraversion-Introversion);
- *Agreeableness* which reflects individual personality differences in concern with cooperation and social harmony (getting along with others versus self-interest);
- *Neuroticism*, also known as *Emotional Stability*, which describes a dimension of personality which refers to the tendency to experience negative emotions.

In psychology, the *Big Five personality traits* have been discovered through empirical research (GOLDBERG, 1993) and the Big Five model has acquired the status of a reference descriptive model in that its five main constructs capture so much of the subject matter of personality psychology (DE RAAD; PERUGINI, 2002). The model is operationalized in the NEO personality inventory (NEO PI-R) (COSTA; MCCRAE, 1992), a 240-question measure of the five personality traits and of their relative six subordinate dimensions or *facets*.

Thus, the trait approach distinguishes personality from more transitory states (e.g. emotions, moods) and intrinsically links traits with individual behaviour. Personality traits have been found to be associated with significant variations between individuals' language production behaviours (PENNEBAKER; KING, 1999) and scores on personality factors have shown to correlate with some aspects of language use (DEWAELE; FURNHAM, 1999). However, Pennebaker *et al.* (2003) report of only one study which investigates language and all the *Big Five personality factors*. In addition, recent data-driven studies have investigated personality and language in computer-mediated communication. For example, Gill and Oberlander (2003) have investigated text in e-mail and weblogs, suggesting that there are word n-grams, and parts-of-speech n-grams associated with each end (High or Low) of both Extravert, or Neurotic dimensions. Nowson *et al.* (2005) report that more than Extroversion or

¹ The factor termed *Psychoticism* refers to a trait whose high levels are linked to psychoses (e.g. schizophrenia).

Neuroticism, Agreeableness appears to be strongly associated with the *formality*² of a speaker's language in weblogs.

However, there still appears to be a lack of studies in the literature which observe the use of language in topical community weblogs and how it relates to the *Big Five personality factors*. This issue is at the core of the present research study.

4. The Research Study: Aim and Hypotheses

The aim of the present research is to study the relationship between personality factors and language behaviour in a relatively new type of computer-mediated communication environment, namely, a topical community weblog. This type of *journal* weblog was created as an exploratory experience for pedagogical purposes on an academic teacher education programme³ at the *Scuola di Specializzazione per l'Insegnamento Secondario* (SSIS) at the University of Calabria in Italy. The pedagogical objective was to offer a group of student teachers the opportunity to experience an *out-of-class* blog project, bridging in and out-of-class learning. During the 8-week project, student teachers were required to upload postings and comments to the topical community weblog in English, expressing and sharing thoughts, opinions and ideas on professional issues suggested by the teacher educator. While the *weblog* was created to discuss and reflect in-depth on in-class content (*topical*) as members of a restricted collaborative group (*community*)⁴, it also provided participants with the chance to experience a new learning environment, developing technological skills and even engaging in *personal talk* beyond professional topical issues. Alongside the pedagogical objective, the topical community weblog was a valuable source to carry out the research reported in this paper. Two hypotheses were tested in the study:

- Hypothesis 1: personality traits are projected linguistically in a topical community weblog;
- Hypothesis 2: the *Big Five personality factors* can be correlated to language behaviour through specific trait markers in a topical community weblog.

2.1 Participants

22 pre-service EFL teachers (19 females and 3 males, averagely aged 25 years) participated in the *out-of-class* blog project. Participants were all attending

² Formality can be understood in terms of *explicitness* (formality or context-independence) versus *implicitness* (informality or context-dependence), which Heylighen and Dewaele (2002) explore in greater detail.

³ In teacher education, journal writing has been discussed as a valid means of reflective teacher development (GEBHARD, 1999) and the use of personal logs has been encouraged in teacher education projects to support teachers in developing self-awareness of the ongoing process, leading them from intrapersonal inquiry to interpersonal reflection (PLASTINA, 2006).

⁴ Weblog access was restricted to project members only to avoid levels of anxiety and inhibition deriving from performance in the public sphere.

their second and final year at the *Scuola di Specializzazione per l'Insegnamento Secondario* (SSIS) at the University of Calabria in Italy. 6 participants already had some blogging experience with *commentary* blogs, 2 had their own personal blog, but none were familiar with topical community weblogs. Prior to the study, the group volunteered to participate in the blog project, accepting the underlying research purposes as well as the immediate pedagogical ones. Participants were fully aware that the topical community weblog was authored by their teacher educator who was also acting as the researcher of the present study. By completing questionnaires and acting as co-authors of the weblog, participants were volunteering their data and giving explicit permission for it to be used. Anonymity is assured as data is made available.

2.2 Methodology

The study was conducted in three main phases.

In the first phase of the study, the trait approach was applied to identify subjects' *Big Five personality factors* prior to blogging practice. For this purpose, Buchanan's (2001) online implementation of an IPIP five factor personality inventory was chosen. After receiving immediate online feedback on their scores, all informants were required to e-mail their results to the researcher. Personality data was analysed and rated on a 3-point scale (high, average, low) for all informants' five personality factors. Although the online questionnaire would have had few or no sampling effects due to the specific technology used in internet questionnaires (BUCHANAN; REIPS, 2001), a traditional implementation of the same questionnaire was also sampled in class to avoid technological biases. Data from both samplings were compared to test consistency.

In the second phase, a corpus of weblog language was created. Extreme scores (high and low personality factors) were correlated to language behaviour. Inferences on expected outcomes were made, based on a Linguistic Inquiry and Word Count (LIWC) analysis designed by Pennebaker *et al.* (2001).

In the third phase, a LIWC data-driven analysis was carried out on personality sub-corpora to verify whether personality traits were projected linguistically in the topical community weblog (Hypothesis 1). Comparative analysis was carried out on data findings and previously expected outcomes. Data findings were also compared with LIWC average findings in personal and formal texts in order to pinpoint possible personality deviations due to the blog context. In this phase, qualitative research was also conducted on quantitative findings in order to gain understanding if all the five personality factors can be correlated to language behaviour in a topical community weblog (Hypothesis 2). For this purpose, the entire corpus of weblog language was scanned to identify personality language markers. A psycho-lexical approach to personality (DE RAAD, 2000) was introduced to categorise the personality language markers and to trace a qualitative pattern of personality in the topical community weblog.

2.3 Research Tools

Three research tools were employed in the study. In the first phase, Buchanan's (2001) online five-factor personality inventory was introduced and administered to the group. Based on Costa and McCrae's (1992) revised five-factor personality inventory, Buchanan's inventory consists of 41-items with which participants rated themselves online, using a 5-point Likert scale (very inaccurate, moderately inaccurate, neither inaccurate nor accurate, moderately accurate, very accurate). In the second phase, the Linguistic Inquiry and Word Count (LIWC) text analysis software program was employed to calculate different lexical categories which project personality factors, and which were used as language behaviour variables in the data-driven analysis carried out in the third phase. LIWC captures, on average, over 86 percent of the words people use in writing and speech and has shown to have internal reliability and external validity (PENNEBAKER *et al.*, 2001). Moreover, De Raad's classification (2000) of *The 100 unipolar markers of the Big 5* was applied in the third phase of the study to conduct qualitative research. Raad's unipolar markers attribute 10 positive and 10 negative traits to each of the Big Five personality factors.

3. Findings and Discussion

In this section, the main research findings are presented and discussed. In particular, quantitative data collected from Buchanan's questionnaire on five-factor scores are presented. High and low score findings are then matched against expected research outcomes on different personality factors and inferences are made, based on LIWC output variables. Quantitative LIWC data findings on single personality sub-corpora are then illustrated and compared to expected outcomes and to other contexts of use (personal and formal texts). Qualitative findings, identifying the most significant trait markers of the Big Five personality factors in the topical community weblog, are eventually discussed.

3.1 Findings on Personality Factor Scores

All informants forwarded both their online and offline feedback data on Buchanan's questionnaire which proved to be consistent. This demonstrates that there were no sampling effects due to technology. Personality Factor Scores were rated on a 3-point scale (high, average, low) and findings are summarised in Table 1 below. Findings show a significant range of scores in the "average" band for Extraversion (63.7%), Conscientiousness (63.7%), Neuroticism (50%) and Openness (45.5 %). There is also a very heavy bias towards scoring "high" on Agreeableness (81.8%) and a slight bias to scoring "low" on Neuroticism (45.5%). Overall, scoring results offer a good approximation of a normal sample of heterogeneous personality traits.

Table 1: Quantitative findings on subjects' personality factor scores (BUCHANAN, 2001)

Personality Factor	High	Average	Low
Factor 1: Extraversion (Surgency)	6 (27.3%)	14 (63.7%)	2 (9.0%)
Factor 2: Agreeableness (Friendliness)	18 (81.8%)	3 (13.7%)	1 (4.5%)
Factor 3: Conscientiousness (Will/Dependability)	5 (22.6%)	14 (63.7%)	3 (13.7%)
Factor 4: Neuroticism (Emotional Stability)	1 (4.5%)	11 (50.0%)	10 (45.5%)
Factor 5: Openness (Culture or Intellect)	9 (40.8%)	10 (45.5%)	3 (13.7%)

3.2 Findings on Personality Factors correlated to Language Behaviour

All *high* and *low* scores found (see Table 1) were correlated to language behaviour (cfr. PENNEBAKER; KING, 1999; DEWAELE; FURNHAM, 1999) to verify whether personality traits were projected linguistically in the topical community weblog (Hypothesis 1).

For the purpose, the LIWC analysis (PENNEBAKER *et al.*, 2001) focused on seven of the potential eighty output variables, available from the LIWC. These language variables were identified in terms of those which would mark significant differences in personality factors, and included:

1. *self-references* (use of first-person pronouns);
2. *social words* (second and third-person pronouns, proper names, verbs, adverbs);
3. *positive emotional lexis* (nouns, adjectives);
4. *negative emotional lexis* (negations);
5. *overall cognitive words* (inclusion, e.g. *and*, *with*; exclusion, e.g. *but*, *without*; tentative, e.g. *maybe*; certainty, e.g. *always*; insight, e.g. *think*, *believe*; causation, e.g. *because*, *effect*; inhibition, e.g. *stop*);
6. *articles* (a, an, the);
7. *big words* (> 6 letters).

Thus, text sampling could be performed to calculate the use of different linguistic categories individuals make across a wide range of text types, and also to determine which trait-descriptive words occurred. The advantage of using LIWC also consisted in its ability to automatically compare input data to their occurrence in random personal and formal texts, as reported in Section 3.3 below. This comparison was crucial to the study as it allowed us to characterise correlations between personality factors and language behaviour in the topical community weblog.

However, text sampling was preceded by an attempt to estimate correlations between single personality factors and language behaviour. Inferences were framed in terms of frequent linguistic preferences made in written texts generated by authors at the High end of a given personality dimension as compared with authors at the Low end of that same dimension. Furthermore, inferences were aligned with the

aforementioned seven output variables. In this way, correlations between personality factors and language behaviour were made and possible differences, which could be found (+) or not (-), for each personality dimension were estimated as shown in Table 2 below.

Expected language outputs were then tested on samples of weblog language. Findings are reported in the following section.

3.3 Findings on personality sub-corpora of weblog language

A corpus of 31.645 words⁵, included in 225 weblog texts (166 postings and 59 comments), was compiled. The full corpus was first stratified into sub-corpora per authors⁶.

Table 2: Estimated correlations between personality factors and language behaviour

	HE	LE	HA	LA	HC	LC	HN	LN	HO	LO
Self-references	-	+	-	+	-	+	+	-	-	+
Social Words	+	-	+	-	-	+	-	+	+	-
Positive Emotional Lexis	+	-	+	-	+	-	-	+	+	-
Negative Emotional Lexis	-	+	-	+	-	+	+	-	+	-
Overall Cognitive Words	+	+	+	+	-	+	+	-	+	+
Articles (a, an, the)	-	+	-	+	-	+	-	+	+	-
Big words (> 6 letters)	-	-	-	+	-	+	-	+	+	-

HE: High Extraversion; LE: Low Extraversion; HA: High Agreeableness; LA: Low Agreeableness; HC: High Conscientiousness; LC: Low Conscientiousness; HN: High Neuroticism; LN: Low Neuroticism; HO: High Openness; LO: Low Openness.

Sub-corpora, whose authors had scored high and low personality levels⁷ (see Table 1), were grouped into 5 personality sub-corpora as follows: 1. *Extraversion sub-corpora* with 4.164 words (6 High Extrovert bloggers) and 1.058 words (2 Low Extroverts bloggers); 2. *Agreeableness sub-corpora* with 6.579 words (18 High Agreeable bloggers) and 1.189 words (1 Low Agreeable blogger); 3. *Conscientiousness sub-corpora* with 2.113 words (5 High Conscientious bloggers) and 846 words (3 Low Conscientious bloggers); 4. *Neuroticism sub-corpora* with 987 words (1 High Neurotic blogger) and 955 words (10 Low Neurotic bloggers); 5. *Openness sub-corpora* with 2.480 words (9 High Open bloggers) and 881 words (3 Low Open bloggers). Stratification into personality sub-corpora thus included 21.252 words (67% of the

⁵ It was computed using the MS Word “word count” function.

⁶ All authors of the texts were identifiable as their names appeared under each weblog posting and/or comment.

⁷ Authors had previously e-mailed their scores on Buchanan’s questionnaire and were also identifiable by their personality factors.

original corpus) and each personality sub-corpora was covered by at least 1 blogger. Tables 3-7 respectively report LIWC data findings for each of the 5 sub-corpora. LIWC outputs indicate the average frequency value (%) of language variables calculated in the weblog texts, as well as their average occurrence in personal and formal texts. Comparative findings between high and low weblog figures and context outcomes (blog/personal/formal) allow us to pinpoint possible blog personality deviations.

Findings on the first sub-corpora in Table 3 show how there is no relevant different language behaviour between High Extroverts (HE) and Low Extroverts (LE) in the topical community weblog and that expected correlations did not occur (see Table 2). Findings, in fact, indicate that Introverts projected their personality with major extraversion in the weblog environment, using positive emotional lexis (2.93%) as frequently as that used by extroverts in personal (2.7%) and formal (2.6%) texts. Introverts also appeared less inhibited (cognitive words 11.06%) than extraverts (8.57%) and showed higher cognitive extraversion compared to ratings in personal (7.8%) and formal (5.4%) texts. Introverts also wrote lengthier words (24.10%) compared to both extrovert bloggers (22.41%) and to extrovert authors of personal (13.1%) and formal (19.6%) texts. This noticeable personality difference may be due to the more informal virtual environment and to lower levels of inhibition experienced in the *restricted* community weblog which was accessible only by the blog project members.

Table 3: Data findings on LIWC outputs for Subjects' High/Low Extraversion (HE/LE)

Personality dimension: Extraversion	Blog texts (average %)		Personal texts (average %)	Formal texts (average %)
Language Behaviour Variables	HE	LE	E	E
Self-references	6.53	7.56	11.4	4.2
Social Words	8.81	6.90	9.5	8.0
Positive Emotional Lexis	3.15	2.93	2.7	2.6
Negative Emotional Lexis	0.86	0.85	2.6	1.6
Overall Cognitive Words	8.57	11.06	7.8	5.4
Articles	7.32	7.66	5.0	7.2
Big words (> 6 letters)	22.41	24.10	13.1	19.6

Findings on the second sub-corpora show that bloggers with levels of Low Agreeableness deviated their language behaviour from expected outcomes. Table 4 illustrates how Low Agreeable bloggers almost equalled their High counterparts in the use of less self-referenced language (respectively 4.63% and 5.37%), also making significantly fewer self-references than average Agreeable authors of personal texts (12.4%). This result mirrors the deviation found in the similar frequent occurrence of social words used by both types of bloggers (7.60 and 7.82%). These results indicate that Low Agreeable bloggers had a consideration of their weblog community members similar to their counterparts and almost reached average social levels of Agreeableness in

personal texts (8.5%). Above all, Low Agreeable bloggers deviated significantly in their use of positive emotional language (4.12%) which stood out from the use made by High Agreeable bloggers (2.77%) and by authors of personal (3.6%) and formal (2.5%) texts. On the other hand, minor Agreeable *straightforwardness* was found in High Agreeable behaviour through the frequent use of articles (7.36%) and big words (25.79%).

Table 4: Data findings on LIWC outputs for Subjects' High/Low Agreeableness (HA/LA)

Personality dimension: Agreeableness	Blog texts (average %)		Personal texts (average %)	Formal texts (average %)
Language Behaviour Variables	HA	LA	A	A
Self-references	5.37	4.63	12.4	3.4
Social Words	7.60	7.82	8.5	9.0
Positive Emotional Lexis	2.77	4.12	3.6	2.5
Negative Emotional Lexis	0.85	1.35	2.5	1.7
Overall Cognitive Words	9.23	8.92	7.4	4.5
Articles	7.36	6.22	5.0	7.6
Big words (> 6 letters)	25.79	25.48	12.1	18.7

Data findings referring to the third sub-corpora show how expected outcomes for High/Low Conscientiousness occurred only partially. Although the low conscientious sub-corpora size (846 words) and the frequent use of big words (25.53%) confirm low levels of *systematic* conscientiousness, Table 5 indicates that some deviations related to *self-references* and *social words* occurred. High Conscientious authors were less *self-disciplined*, referring much more to themselves (7.14%) than Low Conscientious bloggers (4.49%). More or less self-disciplined language behaviour may be due to the blog environment, probably perceived by High Conscientious individuals as less *striving and competitive*, and by Low Conscientious bloggers as more *technologically* committing. Despite this fact, the lower group was as conscientiously involved in discussions on blog achievements (social words 7.57%) as the higher group (8.43%).

Table 5: Data findings on LIWC outputs for Subjects' High/Low Conscientiousness (HC/LC)

Personality dimension: Conscientiousness	Blog texts (average %)		Personal Texts (average %)	Formal Texts (average %)
Language Behaviour Variables	HC	LC	C	C
Self-references	7.14	4.49	10.2	4.3
Social Words	8.43	7.57	8.4	9.0
Positive Emotional Lexis	5.00	4.02	3.2	2.8
Negative Emotional Lexis	0.57	1.54	2.7	1.6
Overall Cognitive Words	8.57	9.34	7.5	4.1
Articles	5.14	6.74	5.0	7.5
Big words (> 6 letters)	22.43	25.53	12.0	17.8

Table 6 shows how LIWC findings referring to the sub-corpora on Neuroticism were generally consistent with expected outcomes. However, low neurotics self-referenced their language (6.28%) almost as much as the one high neurotic blogger (7.39%). These figures, which lie between average neuroticism in personal texts (10.1%) and in formal ones (5.2%) are probably due to the *emotional* state of operating in a new environment such as the topical community weblog.

Table 6: Data findings on LIWC outputs for Subjects' High/Low Neuroticism (HN/LN)

Personality dimension: Neuroticism	Blog texts (average %)		Personal texts (average %)	Formal texts (average %)
Language Behaviour Variables	HN	LN	N	N
Self-references	7.39	6.28	10.1	5.2
Social Words	5.43	8.80	8.5	8.0
Positive Emotional Lexis	2.11	5.03	2.6	2.7
Negative Emotional Lexis	0.90	0.52	2.8	1.5
Overall Cognitive Words	8.14	7.75	7.8	6.4
Articles	5.88	8.27	5.0	7.2
Big words (> 6 letters)	21.68	22.17	13.1	19.6

Finally, findings on the sub-corpora dealing with High/Low Openness indicate that expected outcomes were partially consistent with the results found. In Table 7, in fact, there is a noticeable similarity between extreme high/low percentages in terms of *self-reference* (5.00% and 5.90%), *social words* (6.98% and 6.02%) and *positive emotional lexis* (2.70% and 2.04%). Therefore, these language behaviour variables contribute to fostering a similar level of openness in high and low level individuals engaged in blogging.

Table 7: Data findings on LIWC outputs for Subjects' High/Low Openness (HO/LO)

Personality dimension: Openness	Blog texts (average %)		Personal texts (average %)	Formal texts (average %)
Language Behaviour Variables	HO	LO	O	O
Self-references	5.00	5.90	9.3	4.2
Social Words	6.98	6.02	10.5	8.0
Positive Emotional Lexis	2.70	2.04	2.4	2.6
Negative Emotional Lexis	1.29	0.79	2.7	1.4
Overall Cognitive Words	9.40	7.95	7.9	5.2
Articles	8.85	7.34	5.0	7.1
Big words (> 6 letters)	25.28	21.00	13.1	18.6

4. Qualitative findings on the corpus of weblog language

Sub-corpora data and personality language outputs from the rest of the corpus (10.393 words) were qualitatively categorised under De Raad's classification (2000) of the *100 unipolar markers of the Big 5 factors*. All language outputs were found to correlate to 22 unipolar markers, unevenly distributed between 19 positive and 3 negative traits. In a psycho-lexical approach to personality, the 22 unipolar markers of the Big Five personality factors were used to interpret language behaviours and trace a personality pattern of the topical community bloggers as shown in Table 8.

Table 8: Qualitative personality pattern of the topical community weblog (based on unipolar markers)

Unipolar Markers	Factor 1 Extraversion	Factor 2 Agreeableness	Factor 3 Conscientiousness	Factor 4 Neuroticism	Factor 5 Openness
Positive	extraverted talkative assertive active	cooperative pleasant helpful warm generous	conscientious careful practical	relaxed undemanding	innovative creative imaginative bright introspective
Negative	===	uncooperative	unsystematic	emotional	===

The pattern clearly indicates the important role played by the weblog context in deviating expected personality behaviours. In particular, while bloggers showed positive personality traits for all five factors, marked levels of Agreeableness, Openness (5 unipolar markers) and Extraversion (4 unipolar markers) were found. Agreeableness, Conscientiousness and Neuroticism were also negatively marked by one unipolar marker (respectively uncooperative, unsystematic and emotional). These markers were found to correlate to language outputs from texts posted in earlier blog sessions. This implies that negative markers could be correlated to deviated language behaviour, caused by the initially unfamiliar context.

5. Conclusions

The present study has investigated the hypothesis that personality traits are projected through language behaviour in a topical community weblog. It has also tested the hypothesis that the *Big Five personality factors* can be correlated to language behaviour through specific trait markers in this type of environment. Quantitative and qualitative research was carried out, using Buchanan's (2001) online five-factor personality inventory, the Linguistic Inquiry and Word Count text analysis software program and De Raad's classification (2000) of *The 100 unipolar markers of the Big 5*. Quantitative research findings confirmed that personality factors

were projected through language behaviour even in the topical community weblog. However, LIWC outputs demonstrated that there were significant deviations between individuals' personality traits and their language production behaviours in the weblog. In particular, the informal and restricted context of the topical community weblog tended to neutralize or minimize distinctive personality factor differences between high and low extremes of given dimensions. The study, in fact, found no relevantly different language behaviour between extroverts and introverts. Thus, traits of introversion were neutralized in the blog. Furthermore, differences in both Openness and Agreeableness were mainly minimized by positive and social language behaviour, while differences in Conscientiousness were strongly context-related. Indeed, the major or minor use of self-references was strictly related to a variable self-disciplined behaviour, oscillating between feelings of operating in a less competitive or a more technologically committing environment. The study also showed that Neuroticism was the only personality factor projected in the weblog that generally confirmed expected differences. Qualitatively, the research showed how more positive personality traits emerged in this type of context and how the few negative traits resulted mainly from the new operational context. Further research on other topical community weblogs would be of interest to gain deeper understanding of how the Big Five personality factors correlate to language behaviour in this type of environment. A follow-up to the present research will focus on the investigation of personality and language variables in a topical community weblog for academic purposes which is unrestricted and, therefore, authentically positioned in the worldwide *public* sphere.

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Relative salience of information and associative connotations in press advertisements

1. Introduction

The language of advertising has been in the focus of linguists' attention for almost half a century, if we accept that the first comprehensive account of the advertising language was Geoffrey Leech's *English in Advertising. A Linguistic Study of Advertising in Great Britain* (1966). This book has shaped for many years the way in which the language used in commercials was studied, but subsequent modifications and developments in the style and strategies of advertising, the available media, the linguistic and psychological theories used for description and the analytical tools applied to the research, have yielded an impressive collection of publications on the subject. They are a written record of a very interesting evolution both in the perception of the phenomenon of advertising itself and in the scientific trends shaping the investigation of the subject matter. Exemplification could include an interesting shift in the point of focus following the birth of cognitive linguistics, breeding such works as Forceville's *Pictorial Metaphor in Advertising* (1998), or new analytical paradigms embodied in Tanaka's *Advertising Language: A Pragmatic Approach to Advertisements in Britain and Japan* (1994). The former is an excellent account of the intriguing mechanisms which govern the encoding and interpretation of metaphors which combine linguistic and pictorial elements to yield the ultimate effect, while the latter successfully applies Sperber and Wilson's *Relevance* (1986) to the analytical investigation of culturally diverse instances of advertising.

Recently a certain shift could be observed from the content-analysis paradigm to the investigation of the reception of advertising messages by various groups of recipients, partly due to the development of new research methodologies and devices. Here we could list the studies investigating viewers' appreciation of particular elements of advertisements (e.g. GARCIA; YANG, 2006; LAGERWERF, 2007; van MULKEN *et al.*, 2005; USTINOVA, 2006), noticing and remembering of commercials (e.g. DIAO; SUNDAR, 2004), the effects of advertising on recipients' behaviours and attitudes (e.g. BUIJZEN; VALKENBURG, 2003; KAPLAN, 2007) or the interpretation and processing of the content (e.g. WOJTASZEK, 2007, 2009, in press). Giora's *Graded Salience Hypothesis* (2003) as well as new developments in pragmatic theories of meaning, describing it as a construction in which both the

sender and the addressee take an active part (CLARK; WILKES-GIBBS, 1990; CLARK, 1996; KECSKES, 2008), also offer interesting perspectives for inclusion in the analysis of the viewer's contribution to the ultimate meaning and sense of advertising messages.

2. Framework of analysis

Advertising messages, no matter in which medium they are encountered, always present a serious analytical dilemma. They are never purely linguistic¹, quite the opposite; their ultimate effect almost always depends on an intriguing combination of meaning construction on many levels and in various modalities. It is virtually impossible to capture descriptively the contribution to the understanding of the message of all potential factors, such as the language used, the visual and sound illustrations, the placement of the ad, the social and cultural variables exploited by the copywriters or the attention and interest level of the recipients. In order to maintain an acceptable level of descriptive precision and accuracy a selection must be made concerning the focus of the investigation. In the present study the analytical attention will be focused on the associative connotations evoked in the minds of the recipients by the construction and the choice of central elements used in press commercials. On the basis of five press advertisements taken from *Gala* magazine (issue 24, June 2007), an interview was constructed and conducted with 60 male and female students of English, all ranging between 21 and 28 years of age. Such a choice was dictated by the need to reduce the danger of receiving data whose categorization and orderly presentation would prove extensively complex. Since the study of responses to advertising messages involves a reasonably smaller degree of control of the researcher over the gathered and analysed material than in the case of performing content analysis, the author has decided to limit the variability contributed by the group of subjects. It was also interesting for the author of the study whether such a relatively homogenous group of subjects would report similar reactions to selected elements of the advertising messages used in them. The selection of an interview as the data collection tool constituted another important factor in the context of restrictions applied to the variability of the group. Being a qualitative rather than quantitative type of instrument, it promised to provide relatively variable responses; in this situation the choice of a homogenous group of respondents offered a counterbalance to such a tendency.

¹ Strictly speaking, no use of language is 'purely linguistic' in the sense of being devoid of any extra-linguistic elements whatsoever. It is always accompanied by additional stimuli activating other modes of perception. Besides, only those who believe in the existence of a separate module for language in our mind would allow for the abstraction of 'pure language' from other types of cognitive constructs. Such a model of mental structure of human beings does not seem to have many followers nowadays.

Such a construction of the investigation entails both inductive, bottom-up facets, as well as deductive, top-down elements. Cap (2003) shows that although certain text types might apparently lend themselves to a given mode of analysis, the actual practice reveals that it is sometimes not the case. Many publications on the language of advertising demonstrate that analysts are inclined to follow a pre-determined top-down path, manifested in approaching a particular segment with a clear-cut hypothesis about the function it performs, and in assuming that the elements encountered in the text sample are indicators of that function. This bias, however, does not have to have detrimental effects for the analysis, on the condition that the awareness of such tendencies results in proper interpretation of the findings. The conclusion to be drawn from such methodological considerations is the postulate to allow a degree of flexibility in the initial classification of the advertising texts and their division into particular components. For example, Leech's (1966) division of press advertisements into component parts, although analytically very useful, might potentially obscure important functions of certain elements, if they are initially classified as parts of, say, *signature line* or *body copy*. That is why in the present study no such division was imposed on the recipients or suggested to them, in order to achieve a balanced degree of bottom-up processing of the messages.

Summing up, the deductive, top-down aspects of the research can be summarized as the division of analyzed commercials into component parts for the purpose of description and identification, the choice of certain points of focus in the formulation of interview questions, as well as the construction of the interview, in which the respondents were answering questions related to the commercials viewed in a bit of an unnatural fashion, which could lead to an accumulation of 'observer effects'. The inductive, bottom-up counterbalance was to be ensured by maximal reduction of pre-exposure instructions for the viewers, open-endedness of the majority of the questions in the interviews, requests for respondents' autonomous identification and hypothesizing in relation to the significance and function of various elements in the commercials, as well as by inclusion of the perspective of viewers' private experience in the investigation.

In terms of its scope the study follows up on three other pieces of research focusing on the perception of advertising messages. The main concern of the first one was related to the consequences of certain legal limitations imposed on advertisements, in the sense of enclosure in the ad of items which are, for various reasons, unfavorable for the advertiser. The necessity of their inclusion is dictated by the law, which enforces the regulations of fair competition and ban on deceptive practices by the advertiser. Thus, Wojtaszek (2007) investigates the effects of various ways of backgrounding and disguising the unfavourable claims by the advertisers on their reception and retention by the viewers. The study proved relatively high effectiveness of application of such evasive mechanisms as the use of small print, high complication of pseudo-scientific language, indirectness and modal modifications. It has been observed that similar parts of advertising messages tend to be neglected by the viewers, non-declarative

constructions are transformed into declarative ones, unconnected or misconnected parts of messages are modified into coherent sequences of information and favourable implicatures are often decoded on the basis of application of the Relevance Maxim.

In the other two studies (WOJTASZEK 2009; WOJTASZEK in press) a similar procedure to the one applied in the present investigation was employed to investigate the processing of highlighted information by a homogeneous and a heterogeneous group of respondents, respectively. The points of focus in Wojtaszek (2009) were the product recognition, the identification and processing of the most salient informational content, the interpretation of the slogans and their retention in the memory of the subjects. The present study, based on the same advertisements, will investigate such issues as the perception of the target audience, perception of the features of advertised products and the cognitive effects of the contact between the informational content of the commercials and the world knowledge and experience of the subjects, surfacing in the form of associative connotations reported by the subjects.

The issues mentioned above seem to require two different ways of framing the process of data gathering, especially in connection with the exposure time. In Wojtaszek (2009) the time of exposure was relatively short, approximately 5 seconds per advertisement, which is close to the value reported for unbiased, natural contact with press advertisements. Doliński (2003, p. 91) maintains that the average is two seconds, this however encompasses both the ads which we just glimpse at, as well as those on which we focus our attention for a bit longer. However, the time of exposure selected in Wojtaszek (2009) seemed sufficient in the context of investigation of the most salient elements of press commercials, which were meant to be noticed and processed first. The exposure time used for the present study had to be expanded to approximately 30 seconds per viewing, in order to give the subjects the chance to get familiarized with the complete informational content of the ad. According to Doliński (2003) this is the amount of time we devote to scrutinizing the contents of those commercials which succeed in capturing our attention. Without such an extension of the viewing time the respondents would not be able to answer some of the interview questions, especially those related to the less prominent elements of the commercials selected for the study.

3. The commercials

In order to provide some point of reference for the discussion of the findings it is necessary to present briefly the advertisements which had been selected for the study. As mentioned above, they were collected from *Gala* magazine (issue 24, June 2007). *Gala* is a popular Polish gossip magazine with large circulation, attracting the biggest players in the advertising market. All the advertisements are presented below:



Figure 1: The commercials used in the study: Nissan Micra, Honda Civic, Samsung LCD TV, Lipton Green Tea, L'Oréal Cosmetics

The first two in the collection advertise cars, employing slightly different persuasive strategies. The Nissan commercial is biased towards reasonable argumentation, highlighting the properties and attractive features of the advertised car, whereas the Honda ad focuses on highlighting the emotional thrills offered by the driving experience. The third commercial uses considerably abstract strategies of evoking diverse types of associations related to the advertised LCD TV, whereas the fourth one is a fairly expectable and common advertisement focusing on the taste sensations awarded by a new brand of tea, additionally foregrounding the new packaging. The last commercial for L'Oréal cosmetics relies on simple contextualised product presentation in order to sustain and reinforce the product image and brand status.

4. The findings

The results of the investigation will be presented in three subsections related to the focal points of the study. First, the subjects' perception of the target audience will be discussed, partly in order to check whether they included themselves in the group of addressees of the commercials. Secondly, the recall of the important features of the advertised products will be investigated and compared to a similar issue studied within a different exposure time settings (WOJTASZEK, 2009). Finally, the results pertaining to the subjects' associative connotations evoked by the commercials will be presented.

4.1. *Target audience perception*

It seems that the decision to devote some time to mental processing of an advertising message is heavily dependent on whether we include ourselves in the group of those to whom it is directed. In this respect the present study might have departed from the natural way of processing such messages, because the subjects were asked to study the commercials irrespective of whether they were interested in them or not. It was intriguing to discover whether in such a situation they perceived themselves as the addressees of the advertisements. The issue was not investigated by a simple yes/no question, however. First the respondents were asked to provide a fairly detailed description of the potential addressees, and only later inquired whether they belonged to such a group.

The addressees of the Nissan commercial were described in two-thirds of the responses as women. It seems that the main factors behind such reception were the photograph used in the ad, followed by the stereotype persistent in the minds of many people that women drive smaller cars. One third of the respondents described the addressees as young people, who are also associated with driving smaller cars. Interestingly, however, there were also many people who, after offering the initial response, also added that the possible target groups could include everyone, wealthy people, people with low income, elegant people or people who like to travel. It is noteworthy that two contrasting groups were perceived as the target audience: wealthy people and people with low income. This contradictory interpretation of the advertisement must have been caused by the fact that some of the respondents noticed the price quoted in the body copy part of the ad, while others did not. The price, almost 60 thousand Polish zloty, seems quite high for this kind of car, as many automobiles of similar characteristics are available at lower prices. Thus, the group of respondents who noticed the price in the ad were probably those who described the target audience as wealthy people. Only those who did not read the text carefully enough to catch a glimpse of the price could perceive the car as cheap, following another persistent stereotypical conviction that the smaller the car, the lower the price.

Almost contrasting responses were noted down in the case of the second car commercial. This time, 60% of the respondents described the target audience as men,

with one-third convinced that it could also be those who like driving fast, and also one-third who claimed that Honda Civic is for people who want to show off. Again, the picture seems to be the main contributor, showing an aggressive, red model, with characteristic headlights. The car is also larger than Nissan Micra, so the stereotype of men as drivers of bigger cars is also a vital factor here. The text placed below the photograph highlights the dynamic character and powerful performance of the car, associated in the minds of the respondents with fast driving. The uncompromising design, on the other hand, could have inspired some of the respondents to describe the target audience as people who like showing off. The target groups mentioned less frequently included everyone, energetic people, modern people, women, joyful people and strong personalities. It seems that for some of the subjects it had to take courage to buy a car designed in such an uncompromising way.

The perceptions of the target group characteristics of the Samsung commercial were not so strongly polarized towards one homogeneous description. Here approximately one-third of the respondents came up with such suggestions as the young, the rich, quality lovers, modern people, everyone, married couples (sometimes specifically qualified as childless). The less frequently included options were men and those who love good style. It follows from the above that most of the respondents did not choose one, but at least two or three different descriptions in their responses. Some of them were the results of the influence of the pictorial image (the rich, modern people, married couples), whereas others stemmed from the textual message (quality lovers, those who love good style).

The Lipton Tea commercial was also difficult to qualify in terms of target audience characteristics. One-third of the respondents claimed that virtually everyone could be seen as the intended addressee of the ad, while the others came up with such suggestions as connoisseurs, the health-conscious, people on a diet, brave people, women or new taste seekers. Some of these descriptions are quite revealing about the imagery of the respondents and the stereotypes which seem to be strongly influential in their thinking. The major finding is that green tea is not perceived by the majority of the respondents as the kind of tea everyone would drink. You need to be adventurous, refined or bored with the usual course of life to think of tasting such a weird beverage. The only other kind of reason is being on a diet or perceiving the tea as a kind of moderate remedy for some minor ailments. It is not something that normal people would drink on everyday basis, especially as it contains some unfamiliar ingredients, referred to in the body copy of the ad.

There were no doubts related to the identity of the addressees of the L'Oreal commercial: almost everyone described the target group as women, adding also some qualifying adjectives to this description. They included such qualities as wealthy, elegant, young, quality-conscious or subtle. Slightly more than a half of the respondents also added that the targeted women are the ones who want to feel like stars, like the celebrities mentioned in the ad. Given the type of the products being advertised and the general perception of this well-established brand by the Poles such

findings are hardly surprising. Interestingly enough, one of the respondents claimed that the commercial was addressed to men intending to buy cosmetics as presents for their female partners.

The respondents, all of whom were students between 21 and 28 years of age, identified themselves as the members of the target audience, apart from three distinct situations. Two of them were related to the car advertisements: only one-third of the men thought that the Nissan Micra commercial was addressed to them, comparable to only half of the female students who were ready to admit that they were the addressees of the Honda Civic commercial. The third instance involves the L'Oreal ad, where all but one of the male respondents, mentioned above, excluded themselves from the perceived target group. It follows, then, that the major factor influencing the perception of belonging to the targeted group was the sex of the respondents. However, this finding cannot be in any way generalized, since the sample of the commercials used in the study was very small and by no means representative.

4.2. The product properties

The respondents' perception of product properties is interesting, especially in relation to the same variable studied in Wojtaszek (2009), where the exposure time was significantly smaller (5 seconds, compared to about 30 in the present study). It was expected that certain differences would be reported, resulting from more effective and longer contact with the content of the message, especially its linguistic component.

Although the expectation outlined above was confirmed in the study, the difference turned out to be not as significant as initially expected awaited. In spite of relatively long exposure time the prevalence of visual impressions, not based on the text of the body copy, was observed. Two-thirds of the respondents described Nissan Micra as small and easy to park, followed by 50% noticing that the model presented in the ad was convertible and about one-third adding that the car was comfortable, sporty and nicely designed. This was more or less in line with the perceptions reported in Wojtaszek (2009). A bigger group of respondents, however, noticed that the car was described as spacious, equipped with air-conditioning, large trunk, glass roof, and characterized by low fuel consumption (about 20%, compared to only 7% in the previous study). An interesting finding is related to the perception of the price, there were a couple of subjects describing the car as cheap, balanced by a similar number of those for whom it seemed to be expensive. This is directly related to the perception of the target group of this advertisement discussed above, where the commercial was seen as addressed to the wealthy people by the respondents who paid attention to the price included in the body copy. Finally, there was one interesting tendency, consistent with the findings reported in Wojtaszek (in press), where the respondents were found to include in their descriptions properties not mentioned in the text, such as airbags or ABS system. The explanation lies in the subjects' familiarity with the genre, causing them to transfer subconsciously the informational content usually encountered in such commercials to the ones analysed in the present study.

Very similar tendencies were observed in connection with the Honda advertisement. Here also the visual impressions shaped the respondents' reports to a large degree. Half of them described the car as fast, with one-third of the responses including such features as interesting headlights, luxury and spaciousness. Slightly larger percentage of the respondents, in comparison to Wojtaszek (2009), managed to familiarize themselves with the text content, mentioning that the car was described as exceptionally designed, equipped with powerful engine, safe and economical in use. There were also some subjects highlighting the joy of driving, comfort and technological advantage. Certain features not mentioned in the commercial were nonetheless reported, including air-conditioning, ABS, airbags, GPS and insurance included in the price of the car.

Since the text of the Samsung advertisement was the shortest of all, there were no significant differences in its recall between the subjects of the present study and those who participated in the investigation in Wojtaszek (2009). Almost all of them were mentioning such features of the advertised device as flat screen, excellent rendition of colours and good contrast of the picture, adding high quality to the list of the TV. The new elements which appeared in the description were related to certain benefits offered by the equipment, with the subjects claiming that it would definitely impress the visitors and allow the owner to save space, as a result of the flat screen design.

The properties reported in connection with the Lipton Tea advertisement confirmed that the respondents had enough time to familiarize themselves with the textual information placed in it. Thus, in addition to the information reported in the previous study, related to the shape of the teabag and the original taste of the tea, the respondents also mentioned the factors contributing to it, such as the mild sweetness and invigorating aroma. Interestingly, also in connection with this commercial there were responses reporting features not mentioned in the ad, and probably based on the subjects' personal experience with herbal teas, related to the products' effects: assistance in weight loss, calming effect, and the catalyst of better metabolism. Similar properties were also reported in Wojtaszek (in press).

The L'Oreal commercial was the richest in informational content, both in its pictorial, as well as textual dimension. There were many products visualised in the photograph and listed in the text, so the subjects who had more time to view the commercials were also significantly better in the recall of particular products, such as lipstick, eye-shadow, mascara, powder or brush. Characteristically, the list was extended by some respondents who included in it products not visualised in the ad, such as foundation cream or eyebrow pencil. Since the text also included the description of the benefits related to the use of the advertised cosmetics, many subjects pointed out that thanks to them they would feel like the celebrities mentioned in the ad, that their complexion would be properly taken care of and the women using the products would be more beautiful and attractive. In comparison to the responses noted in Wojtaszek (2009), which related mainly to the high quality and brand characteristics, here the answers turned out to be influenced by the content of the advertisement to a much higher degree. The respondents did not need

to rely on their personal experience so much and engage in confabulation (although this also happened), but could take advantage of a longer exposure time in order to support their responses with the message content.

4.3 *The associative connotations*

Arguably, one of the most important roles of advertising messages is evoking positive associations in the minds of the recipients. They could be related to the perception of the product, the benefits of its use, the self-image of the target audience, the image of the producer or even to the overall image of the world in which the product occupies an attractive place. In order to investigate such effects the respondents were asked to answer questions related to selected elements of the advertisements which seemed to invite specific associations. Open questions related to general impressions or associations connected with the ads were avoided, because on the one hand they could return very variable responses, difficult to qualify and compare, and on the other hand they would leave the respondents without sufficient points of reference, being uncertain about what exactly they were supposed to report. In this situation a certain degree of deductive, top-down limitation of options seemed necessary, to allow for some degree of comparability of the responses.

One of the elements which seemed to bear a significant role in evoking particular associations was the colour applied in the commercials. In three of them it was red. Interestingly, the significance of this colour is always derivable to a large degree from the context in which it appears. There is, of course, a very important ingredient contributed to the meaning by the associations with the colour red based on subjects' prior life experience, but the regularities noted in the responses tied to particular advertisements suggest that the predominant interpretative clues reside in the contextual framing. Thus, in the Nissan Micra commercials, one-third of the respondents associate the colour with love, and the same proportion with heart which is often the symbol of love. For many it is a colour that is suitable for women, and the associations which were less frequently reported included such items as fire, passion, contrast, Ferrari, communism, friendship and speed.

Interestingly, in the Honda Civic advertisement speed is mentioned by a quarter of the respondents, and the features listed equally often include contrast and aggression. The position of associations with love is significantly lower than in the previous commercial, reaching 18% here. Other associations, less frequently mentioned, include fire, modern style, a color for men and, interestingly, safety. Asked for explanation, the subject who came up with this response replied that a car which is red is easy to notice on the road, thus offering better safety.

The responses evoked by the L'Oreal commercial were surprisingly homogeneous, because for most of the respondents red was associated with luxury (70%), and with love (40%). Different associations were reported very infrequently by single subjects, so they did not contribute significant modifications to the two predominant elements. In line with the interpretation of red outlined above was the significance of gold, also

used in the L’Oreal advertisement. For many subjects it brought associations with wealth and luxury.

When it comes to other colors, it seems that green plays an important role in the Lipton Tea commercial. First of all, this is the color of the tea, but for many subjects (approximately one-third reporting each) it is associated with freshness, nature, tropics and mystery. All of these associations belong to images which are definitely very positive in the minds of people, contributing in this way to the overall positive perception of the advertised product.

Quite a different role was attributed to the white and pale grey shades applied in the Samsung TV advertisement. They were associated with such qualities as order, elegance and cold atmosphere, but for most of the respondents such colors were used as the background for the colorful TV screen, enhancing the contrast between the product and the surrounding elements. Perceived in this way, the white and grey would symbolize dullness and monotony.

Another interesting element likely to evoke intriguing associations was the pyramid shape used in the Lipton Tea commercial. Apart from the connections with the shape of the tea-bag, reported by many, it also produced associations with traveling to exotic places such as Egypt or Mexico on the one hand, and with the mysterious nature of the famous shape, on the other. The text of the slogan (*Nowy wymiar smaku – New dimension of taste*) creates an interesting connection with the pictorial image, where the significance of *dimension* revolves around two major pivots, related to the unknown, unexplored territories and the shape of the new tea-bag, which becomes truly three-dimensional now, contrasted with the ordinary flat alternative.

The young couple visualized in the Samsung commercial also produced interesting interpretations. Although most respondents claimed that the people in the photograph were either a married couple or lovers, the emotional relations between them were described as cold and reserved. The woman is not looking at the man, and the man, although directing his eyes towards her, assumes a distancing, reclining body posture. The woman seems to be much more attracted by the TV than by the man. On the one hand, it produces a strengthened image of the advertised product, appearing as the most attractive element depicted in the commercial, but on the other hand it risks producing unfavorable conclusions, that the purchase of the television will destructively affect interpersonal relations between couples. This kind of impression was reported by 20% of the respondents.

The last two elements investigated in the present study are related to the French language and culture. In the Nissan Micra advertisement the main slogan reads *I  Saint Tropez*. The little red car is a symbol requiring two-level processing. First, the viewer should associate the construction with the pattern *I ♥ X* and reinterpret it as *I ♥ Saint Tropez*, which leads directly to *I love Saint Tropez*. The significance of *Saint Tropez* and reconstruction of the advertiser’s intentions in evoking it was expected to cause an interpretative problem. There were many subjects who associated *Saint Tropez* with the famous comedy series starring Louis de Funes. Such associations

obscured the connections of the town with the advertised product for a number of respondents. Some others connected *Saint Tropez* with the French Riviera and a popular holiday destination. In this context the relationship with the advertised car was still difficult to establish. Only those for whom *Saint Tropez* symbolized a small city with many narrow streets and hardly any place to park were able to decipher the advertiser's intentions. This was easier for those respondents who have overcome the third potential difficulty in form of the division of the slogan into the main part and the less conspicuous one which read *miasta są stworzone dla Micry* (*cities/towns are created for Micra*). Only 55% of the subjects were able to formulate the interpretation intended by the advertiser: *I love small towns such as Saint Tropez because I can easily drive my Nissan Micra through their narrow streets and park everywhere I need.*

The other use of the French language was applied in the L'Oreal commercial, where the labels on the products in the picture are all in French, although the advertisement appears in a Polish magazine. The products are also sold in Poland with French labels, so the ones in the commercial look the same as the ones available in the shops. The associations brought by the French language are tied to images of good quality and France as the country of origin of the product, which is definitely more favourable than the idea that they were made in Poland. This is a strategy applied not only in Poland, but also in many other countries, where cosmetics are internationally recognized as being associated with France, in the same way as watches are associated with Switzerland and certain cigarette brands with the USA.

5. Conclusions

The analysis of the responses gathered by means of the interviews rendered a collection of interesting conclusions pertaining to the associations evoked in the minds of the subjects in response to extended exposure to the advertising messages. It turned out that the properties of the advertised products were remembered better following a longer exposure time, but at the same time an interesting form of confabulation was detected, involving the listing of features not included in the commercial. This must be directly related to the heavy influence of subjects' prior experience of the genre, where such elements are usually found.

The conclusions pertaining to the perception of the target audience cannot be generalized, given the limited size of the sample of advertisements. In the present study the major factor deciding the self-identification as a member of the target audience was the sex of the subjects, but this effect was caused by the type of products advertised in the studied commercials. With much larger samples the results would probably allow for more enlightening discoveries related to the issue.

Finally, the associative connotations reported by the subjects turned out to be heavily dependent on the contextual framing of the triggers. An important feature was that the associations were almost always positive, as if the subjects were blind to potentially negative meanings carried by some of the items under investigation. The

color red, for example, can be associated with blood and injuries, but such connections were never reported. It seems that the consciousness of the type of genre under analysis automatically excludes such interpretations, placing them in a dark background of the subjects' minds. In processing advertising messages, it seems, we exhibit a very strong tendency to focus on the positive interpretations and devote much of our processing effort to finding associations compatible with this type of discourse.

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Language Disorders and Speech Pathology

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The prosodic parameters used in meaning construction of the aphasic discourse

1. Introduction

1.1 *Aphasia and the aphasic individual*

The assumption that language establishes itself through interaction between two or more subjects can be taken as the starting point to investigate a series of events that influence the building up of meaning during discourse construction. This paper investigates the prosodic parameters used in meaning construction of an aphasic individual during interaction with his colleagues from the Grupo de Convivência para Afásicos da UNICAP (UNICAP Aphasic Coexistence Group) in weekly meetings.

Aphasia can be considered as a disorder in the main language processes, without jeopardizing afferent and efferent channels related to the reception and expression of speech, such as hearing and voluntary, autonomous and reflexive motor skills of phono-articulation organs (OLIVEIRA, 2005). Therefore, aphasia can be defined as:

Alterations of linguistics processes of signification of the articulation and discursive origins caused by acquired focal injury in the Central Nervous System in language-relevant areas, whether or not associated to changes in other cognitive processes (COUDRY, 2001, p. 5).

According to Morato *et al.* (2002), aphasia can be described as a language disorder that induces changes in all levels of linguistics processes, in their productive as well as interpretative aspects, that can manifest themselves in speech production and comprehension, reading and writing. It is a language issue not a merely motor difficulty (MORATO *et al.*, 2002).

This alteration in language functioning is usually acquired as a consequence of an injury to the left brain hemisphere, the main language area and the one responsible for speech or the comprehension of spoken words. When the injury affects the right

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hemisphere, intonation and rhythm of speech can be altered. This injury may be due to a cerebrum-vascular accident or CVA (a stroke), a traumatic brain injury (both with and without skull perforation), aneurysms, brain tumor or local degenerative diseases and infections compromising the mentioned area. Aphasic individuals normally are unaware of this neurological damage when this disorder happens suddenly and without any visible symptoms (MORATO *et al.*, 2002).

After the neurological episode, the living conditions of an aphasic person are proportional to the intensity of the psychosocial impact of the disorder on the individual and his family. The individual also becomes a target for cognitive and psychical processes such as anxiety, frustration, isolation, aggressiveness and depression thus, this pathology affects not only the individual but his family, promoting an abrupt change in their lives. In general, social interactions are weakened and, in some cases, the aphasic individual is socially isolated due to communicative and motor difficulties reinforced by the shame of his “new” condition (SANTANA; DIAS; SERRATO, 2007).

In the present study aphasia is understood as a disturbance of language in which linguistic mechanisms of all levels are changed in their productive and interpretative aspects. As a consequence of this disturbance there is a rupture in main language process without damage to afferent and efferent channels related to the perception and expression of speech such as hearing, and voluntary, autonomous and reflexive motor skills of phono-articulation organs.

This perspective points out a disorganization in one or more linguistic components as the aphasic individual may mishandle the ability to store, access, monitor and express names, ideas and events influencing both signifier and signified. Amnesic disorders, disorganization of the capacity to generate or learn grammar rules, of the capacity to use the code of a language (codifying), the capacity to comprehend the codes of a language (decoding) and of storing information also may occur as these are disorders of language expression and comprehension (COUDRY, 2001).

Aphasia may vary from the type which prevents any expressive or interpretative possibility to that in which difficulties of language are almost imperceptible. This variety is due to many causes not only the organic ones but also different reasons such as the degree of neurological compromise, the capacity of regeneration or the brain plasticity (OLIVEIRA, 2005).

There is no pharmacological or surgical treatment for this language disorder although some medication can be prescribed in order to help brain dynamics. Even with good and adequate therapeutic assistance, aphasic individuals in general do not fully recover their language, that is, they hardly ever go back to the pattern they were used to before the brain injury (MORATO, 1999).

As it severely affects language (oral and written) and consequently all processes related to it, it is not hard to picture the impact of aphasia on the lives of those who coexist with aphasic individuals. Speech sounds are laboriously articulated, pieces of words are repeated, distorted or suppressed, even when the individual does not present

either stuttering or physical deficiency which prevent him from articulating properly. In some situations, aphasic subjects might even speak telegraphically (MORATO *et al.*, 2002).

Changes in other processes such as neurological ones can be observed along with aphasia – hemiplegia (half of the body is paralyzed), apraxia (disorder of motor planning), agnosia (recognition disorder), anosognosia (related to the lack of awareness of the problem on the part of the brain-injured subject), dysphagia (related to swallowing difficulties) – and especially cognitive ones and their psychical states – such as depression, isolation, aggressiveness frustration – in different stages and in different degrees in the life of the aphasic individual (MORATO, 1999).

With all this, aphasia constitutes a pathology that affects aphasic individuals and their families, leading to a radical change similar to chaos in their lives. Generally speaking, there is a lack of social interaction as friends get distant and the aphasic subject is normally not able to work. Thus, away from friends and work, family becomes one of the only possibilities of interaction of this group of people and they are likely to live in total social abandonment (SANTANA; DIAS; SERRATO, 2007).

Language, reduced and simplified to its basic features, or semantically, phonemically and morphologically sidetracked from normal language can present phonetic deflection or phonetic paraphasia (a deviation in phonemes production), a phonemic deviation (inadequate selection of phonemes or the improper combination of phonemes in the speech chain), stereotypy (involuntary ritualistic repetition of behavior), agrammatism (inability to use proper syntactic structure characterized by the omission of grammar elements), semantic paraphasia (confusion of words), neologisms (phonemic or graphemic sequences similar to words but inexistent in the language) and/or suppression (total lack of oral or written expression). The aphasic individual express his thoughts in an incomplete manner and the adequate words are not naturally evoked, selected and/or ordered (MORATO, 1999). Deprived of conditions for social interaction beyond his family circle and feeling incapable of living in his former social circle – which does not accept him as a suitable interlocutor – the aphasic individual tends to distant himself from friends. He will gradually cease using language, losing interest in exchanging ideas and reacting to the world. He stops manifesting his wishes and intentions and these become harder to recognize or understand by his interlocutors due to the individual's difficulty in making sense of his speech.

In spite of this chaotic context in which the aphasic subject finds himself it cannot be ignored the fact that language in its aphasic condition, as in its normal functioning, reflects a complex structure beyond the verbal act, an active process that involves constant sharing between interlocutors that does not end by the suppression of speech. Therefore, the importance of language studies beyond its syntactic-semantic-lexical-phonemic features, such as the prosodic ones is essential in building up meaning in discourse.

Linguistic prosody refers to the branch of phonetic and phonology studies that investigates the common elements to language musicality. Prosody is related

to intonation and pitch of phonemes in words and sentences and its main attribution is to emphasize certain syllables, normally the ones with greater intensity, in the case of Portuguese, in the production of words and the rhythm and intonation of sentences.

According to Aguiar and Leal (2004), prosodic features such as segmentation, rhythm and emphasis in a given tone unit play important roles in the construction of meaning. Besides when associated to elements of speech melody, i.e. intonation, they become explicit marks of intention. Thus, it is possible to say that the expressiveness in speech is a natural, spontaneous and intentional prosodic behavior.

It is due to the cognitive and psychical processes executed by aphasic subjects and the range of feelings that can be expressed through intonation that we justify the importance of the study by the sciences which concentrate on human communication and its disorders of prosodic parameters, especially intonation, used in the meaning construction of aphasic discourse.

1.2 Language and prosody: a clue to intentionality

To Behlau and Pontes (1995), voice is one of the strongest extensions of our personality and sense of inter-relation in interpersonal communication. Based on the voice it is possible to know a little about the individual's personality which reveals his feelings. Changes in speed, inflexion, tension and volume when defining the intonation of a sentence establish communication between interlocutors.

According to Cagliari and Cagliari (2006), prosody is related to certain properties of the signal of speech, such as pitch (perceptible changes in the frequency of the vocal folds vibration), loudness (sound volume) and syllable length. The whole of prosodic characteristics may also include factors associated with the length of utterance: accent (referred in the Traditional Grammar as tonicity), rhythm (which is determined by the length of tonic syllables), tempo (or velocity of speech), intonation, texture (the interval between the bass and treble sounds) and voice quality. Pitch is the psychophysical sensation of the fundamental frequency related to the judgment of a sound in its height, and loudness is the psychophysical sensation related to the intensity of a sound translating the sensation of a strong or weak sound (BEHLAU; PONTES, 1995).

Boone (1996) claims that the intensity of speech transmits the intensity of emotions, the level of trust and it is also used to project the voice to long distances besides transmitting the level of emotional control desired when communicating. Behlau and Pontes (1995) defend that intensity translates how the individual deals with his own boundaries and those of other's.

Models used in prosodic processing can be analyzed or represented in three levels: the acoustic level, through which the numerical representation of prosody is obtained in the shape of a sequence of values corresponding to the fundamental frequency, duration and energy; the perceptive level in which it produces a quantitative and compact description of prosodic events realized in the sign of speech by a certain

listener (average values); and the linguistic level, in which the prosody of a word or sentence is represented by a sequence of abstract units (signs or symbols) some of which have a communicative function in speech while other suit the syntactic structure.

Scarpa (1991) defines intonation as the auditory/acoustic effect of the complex composition of prosodic parameters, especially height, intensity, duration and pause. Therefore, the intonation corresponds to patterns of pitch, such as form, function and specific domains. The author also states that variations of the fundamental frequency along with the variation of duration and voice quality are used to mark prosodic boundaries.

The elements of prosody (fundamental frequency, intensity, energy, rhythm and duration) are responsible for emphasis, intonation and inflexion of speech and thus are important in transmitting emotion and meaning into the utterances. Costa (1997) defends that intonation expresses personal states of emotional order such as anger, sadness, and happiness; and of intellectual order such as doubt, opinion, certainty and distrust.

1.3 Intonation pattern and interaction

David Brazil was a pioneer in the study of the role of intonation in the construction of meaning in discourse, in 1985, with the Interactional Theory of Intonation. This theory takes into account the discourse meaning based on the tone structure within an interactive context. Brazil's (1985) interactive model of intonation considers that each intonation aspect adds a different type of information during interaction. The speaker provides intonation clues projecting his communicative intentions and the listener realizes these are intentional clues and uses them as organizers of the elements of his comprehension. Intonation in this sense represents a speaker strategy to coordinate the listener to learn the communicative meaning of utterance.

Intonation patterns act upon discourse to exert three functions in the interaction: organizational function, which explains how tones are used by the speakers to organize discourse; social function, oriented by intonation clues provided by the speakers in order to reinforce their social roles during interaction; and informative function that transmits based on the tonal resource indications of the speech informational content. These functions allow meaning construction during interaction (BRAZIL; COULTHARD; JOHNS, 1981).

The realization of the intonation pattern occurs moment by moment in the process of negotiation of choices in which mutual collaboration is essential. In consequence, the intonation pattern in the speech of any individual maintains a direct relation with his communicative intent at the moment of interaction, influencing the communicative value of oral manifestation. Thus, the tonal choices made by interlocutors define the interactive context.

Each tone unit is delimited by the presence of at least one and a maximum of two prominences, is a result of the speaker's previous choices. Prominence in the

speaker’s choice of stress on a certain syllable is generated by intentionality. The goal of this linguistic choice is to select information that the speaker wishes to emphasize based on shared knowledge. In general, these syllables usually correspond to the tonic accent of words. The whole of tone units is the tonal chain (BRAZIL, 1985; VIANA, 1992).

During interaction the speaker shares structures into tone units so that each portion is perceived by the listener as an intelligible utterance. Tone unit therefore is the segment of utterance to which significant variations are associated. Prominence is in the tone unit that some “previously planned” supra-segmental aspects are realized by speakers, as prominence and tone (VIANA, 1992).

Brazil (1985) studied the concepts of oblique and direct orientation of discourse. In the oblique orientation of discourse the speaker plays the role of a mere word-emitting individual without concern to interactive strategies, showing an inability to attribute the proper elocutionary force. The oblique discourse focuses on the surface of a language without an envisioned receptor and reduces the communicative value of the contained tone units, promoting distance from the listener by the absence of a phenomenon known as speech naturalness. In this type of speech there are two tones: falling, for the points of syntactic completeness, and a different neutral level neither rising nor falling for all other situations.

The direct oriented discourse, however, focuses on the content with a direct concern for the listener. In this case, the range of tones is wider presenting five tones as well as the difference between tonal levels, lending to the utterance a typical natural color for this type of discourse (AGUIAR; LEAL, 2003).

Brazil (1985) considers that the context of interaction is related with more or less recurrence of a certain type of tone. The author describes five types of tones: rising, falling, rise-falling, fall-rising and neutral. Rising and fall-rising tones are *referring tones*, used by the speaker to send messages in the field of shared knowledge. On the other hand falling and rise-falling tones, also named *proclaiming tones*, express the exchange of new information, one not yet shared, and also indicate disagreement. The neutral tone or the level-tone focuses on the language not the listener. These five types are represented on Table 1.

Table 1: Types of tones and their graphic representation

Tone	Representation	Representation
Rising	(↗)	r+
Falling	(↘)	p
Rise-falling	(/↘)	p+
Fall-rising	(\↗)	r
Neutral	(→)	o

Each type is associated to a level (high, mid or low) given to the prominent syllable of the tone unit that serves as a clue for the listener. Each sentence or group of sentences has a general tone, the *Key* which can be high, mid or low. There is no absolute value for the high, mid or low levels even if related to one particular speaker. A level in a tone unit may be lower than a mid level perceived in a previous tone unit. To each tonal group the speaker must select a level: high, mid or low. The average level is neutral, that is there is no prominence. At the high level, *High Key*, the speaker strongly emphasizes the content in the tone unit. When he selects an intonation in terms of semantic interaction, the speaker has the possibility of creating his own marks independent of those provided by the language. Associated to the choice of a level, the speaker selects in the tone unit, proclaiming or referring tones (BRAZIL; COULTHARD; JOHNS, 1981).

According to Viana (1992), the role played by the speaker can be either dominant, when he keeps control of how the interaction should occur, or non-dominant. This means that different levels of involvement of the speaker with his interlocutor can relate to different intentions on the part of the speaker, to different degrees of shared involvement and proximity to the subject in discussion.

To adopt an interactive perspective over discourse facts therefore is to consider that the dialog is co-produced by its many participants in the communicative exchange who, together, preserve the command of conversation. This also implies admitting that far from a purely passive entity, the receptor participates actively in the construction of the emitter's discourse (VIANA, 1992).

We highlight that, beyond a conscious speaker strategy, it is equally relevant to consider the unconscious aspects of intonation which influence the construction of the intentional act. In these moments, the speaker is assaulted against his will by impressions until then unrecognizable and however involuntarily revealed in the rally point of the dialogic exchange (AGUIAR; LEAL, 2004).

According to Viana (1992), if there was not a shared agreement between the users of language on the value of prosodic elements of oral language it would be possible to say anything in any way and the communication would not be disturbed. People's reactions nonetheless demonstrate that we share prosodic values in a way similar to the usage of different language phenomena.

In the present study which adopts a socio-integrationist perspective, it was observed the prosodic parameters used in the construction of meaning by the aphasic individual in its sound production during interactive exchanges with his aphasic and non-aphasic colleagues from the Grupo de Convivência para Afásicos da UNICAP (UNICAP Aphasic Coexistence Group) in weekly meetings.

In order to execute this study we sought to a) identify, in the discourse production of an aphasic individual the intonation parameters of prominence, emphasizing the most recurrent, using transcription fragments obtained from moments of interaction; b) verify the role of these parameters in the organization of these subjects' discourse; c) identify the linguistics strategies used to overcome difficulties derived from his aphasic conditions.

2. Method

Research in this area of knowledge is based on bibliographic findings about Aphasia and on Brazil's Interactive Model of Intonation (1985), considering the prosodic parameters of prominence used in the construction of discursive meaning and developed through:

1. Theoretical investigation of the topics involved in the project
2. Analysis of the collected discursive production
3. Analysis of data and presentation of results

For the present study, one 50 year old male aphasic subject was selected, with a mild type of aphasia that allows him to have good conversational abilities, developing a clear and accurate discourse. The subject regularly attends the Grupo de Convivência para Afásicos da UNICAP (UNICAP Aphasic Coexistence Group).

The collected data was obtained through recording of the spontaneous speech of the subject in moments of interaction with 04 (four) non-aphasic subjects during free and spontaneous dialogue. We sought to identify the intonation parameters of prominence emphasizing the most recurrent ones. Afterwards, we listed the prosodic strategies used to overcome difficulties derived from aphasia.

Free and spontaneous dialogue between the aphasic and the non-aphasic subjects was collected through digital recorder with the duration of 6'52' (six minutes and fifty two seconds). Later on, the material was transcribed using the *Sistema mínimo de notações para as transcrições do projeto sobre fala e escrita* (Minimum system of notetaking for the project on speech and writing) Marcuschi (1999) and Brazil's (1985) Interactive Model of Intonation.

After the transcription the next step consisted of highlighting the prominences in order to identify the discursive intentionality and the analyses of the prosodic parameters of prominence to verify meaning in the aphasic discourse.

Corpus analysis was based on the auditory perception data through Brazil's model (1981) using the following symbols:

Prominent syllables = capital letters	Ex: HOmem
Non-prominent syllables = lowercase	Ex: tremor
Tone chains: // ... //	
Tone units: / ... /	

To represent intonational parameters which can characterize a tone unit the model presented by Brazil (1985) was used, as has been here described its five types of tones and their graphic representations (Table 1).

3. Results and Discussion

In general, there was evidence that among the supra-segmental resources in the aphasic speech to give sense to his discourse, prosodic parameters of fundamental

importance were those responsible for transmitting emotions and meaning through his speech. The most recurrent prosodic parameter used in the construction of meaning was intonation, used as a means to translate affective and emotional states as well as to assign communicative intention into his speech.

In the analyzed discourse fragment, we observed that among the intonation parameters of prominence the most recurrent, with 279 occurrences, was the rising pattern (r+) with communicative value of an Interactive nature to refer to knowledge shared by the interlocutors and serving as a textual anchorage to new information. In these situations, there is evidence of an attempt to avoid interference even if partial from the listener assuming prior knowledge and world shared. This discursive phenomenon, however, appeared in different situations with the same function and present throughout the whole speech, may reveal a strategy adopted by the aphasic subject to keep himself dominant on the discursive process, certainly seeking to overcome issues in the functioning of his own language as shown in the excerpts presented below:

Intonation Pattern	Number of occurrences	Circumstances
a) Rising	279	It occurs in moments when the subject does not allow interference from the listener. It presupposes prior knowledge and world sharing.

Example 1:

Number of lines	Informants	Fragment of discourse
0084	A	//r+ [MAria/r+ do CARmo/r+ maCÊdo/r+ da SILva//

Example 2:

Number of lines	Informants	Fragment of discourse
0197	A	//r+ ortopeDISta/r+ MÉdico/r+ de PÉ/r+ de OSso//

Examples 1 and 2 above reinforce Brazil's proposition (1985) about the usage of the rising pattern to indicate a degree of involvement between interlocutors in which it is assumed the existence of shared knowledge. Actually, because the subjects integrate the same Grupo de Convivência (Coexistence Group) with weekly meetings, they have established a relationship of companionship and complicity which could justify the strong recurrence of rising tones (r+) and rise-falling tones (p+), highlighted below, present in the aphasic discourse with 31 occurrences.

Intonation Pattern	Number of occurrences	Circumstances
b) Rise-falling	31	It occurs when the subject does not allow the interference of the listener; in theory it presupposes prior knowledge and world sharing.

Example 3:

Number of lines	Informants	Fragment of discourse
0070	A	// r + carMInha / o é / o é / o é::: / r + MInha / p+ namoRAda //

Example 4:

Number of lines	Informants	Fragment of discourse
0155	A	/ o orTOpedista / p+ Ele faLOU / r + diz jaIR / p+ TUdo bem / p professoR? / p+ TUdo bem / r + eu VOU / r + faLAR / r + LOgo /

This subject's discourse is marked by rising (r+) and rise-falling (p+) tones considered dominant tones. In the exposed fragments, who owns power over the informational content of speech is the aphasic subject which reflects in the intonation patterns that translate his intentionality in trying to keep the word in the attempt of being better comprehended.

In the analysis of the transcription of all production it was observed that diverging or non-shared information are marked by the falling tone (p). The least recurrent pattern is the fall-rising tone (r) with no occurrence. The falling tone however has 59 occurrences and permits the interference even if partial of the listener revealing strangeness and little certainty on the spoken information. The same happens when a new information is introduced.

Intonation Pattern	Number of occurrences	Circumstances
a) Falling	59	It occurs in moments when the subject permits the interference of the listener; it does not presuppose prior knowledge and there is strangeness and introduction of new information.

Example 5:

Number of lines	Informants	Fragment of discourse
0020	A	/ o maIS veLHInha / p que Tinha LÁ / p mais veLHInha //

Example 6:

Number of lines	Informants	Fragment of discourse
0102	A	// p ahn? //

Example 7:

Number of lines	Informants	Fragment of discourse
0217	A	// r + aí:: / r + eu tõe BEM / o num / p enTENDi: //

Based on the very characteristics of the aphasic discursive production presented in the Introduction of this study, this subject in general demonstrates a high degree of hesitation to speak, shows high instability in the use of words, swapping them in an unexpected and incomprehensible manner. He also presented difficulties in finding those he would like to utter even with a non-amnesic aphasia. The aphasic normally pronounces laboriously the sounds of speech, repeats words or pieces of them, distorts or suppresses them to the point of telegraphic speaking (MORATO, 1999), which benefits the occurrence of the neutral tone pattern (o). This pattern can be interpreted as lack of intention of world sharing, as it does not presuppose prior knowledge and has not the function of introducing new information in the dialog. It also occurs in moments in which the subject allows interference from the listener.

According to the characteristics of the aphasic discourse (cf. MORATO, 1999) and in accordance with Brazil's theory (1985) we verified that in this aphasic individual's dialog neutral tone pattern is predominant, as it appeared 106 times, especially in moments when no information was added or shared. The subject also shows instability in the use of words, repeating, hesitating or prolonging them, etc.

Intonation Pattern	Number of occurrences	Circumstances
a) Neutral	106	It occurs in moments when the subject permits the interference of the listener; it does not presuppose prior knowledge and there is strangeness and introduction of new information.

Example 8:

Number of lines	Informants	Fragment of discourse
0004	A	// o Eu:: / o Eu:: / o Eu:: / o Eu:: / o Eu:: / o Eu:: / o Eu: / r + Essa seMAAna / r + passEI / r + por Uma / o Uma / o Uma /

Example 9:

Number of lines	Informants	Fragment of discourse
0064	A	// (risos) / r + TOda vez / o eu / o eu / o eu / o eu / o me comPLIco / p rapaz / o É::: / r + maRIa / r + bernaDEte / o ôh:oh:oh::: / r + Eu sei //

It has been observed, as we take into account the characteristics of this pathology, that the prosodic resources may yet appear in the aphasic discourse by means of linguistic elements such as pauses, vowel prolongation and hesitation. These phenomena occur in moments when the subject demonstrated difficulties of cognitive planning and in those circumstances when he reorganizes his thoughts and ideas before expressing them. This can be interpreted as a linguistic strategy to overcome difficulties from his aphasic condition. The role of prosodic resources within the aphasic discourse appears as favorable conditions found by the subject to use in moments of forgetfulness, anxiety, frustration, tension, etc.

4. Conclusion

The results here presented demonstrate that prosodic parameters used in the construction of meaning in the aphasic discourse in moments of interactive change with his non-aphasic colleagues do not happen systemically, but in different situations. They are present throughout the subject's speech but are much more noticeable in the moments when the interference from the listener is not permitted; they presuppose

prior knowledge and sharing of subjects and ideas. They also happened in moments of psychical and cognitive alterations causing difficulty in language organization.

The aphasic subject discourse intonational pattern is marked by rising (r+) and rise-falling (p+) tones, considered dominant tones, expressing that the subject detains power over informational content. These patterns translate the aphasic individual intentionality in trying to keep his own discourse in order to permit a better degree of comprehension of his interlocutors.

Furthermore, the analysis results show that the most recurrent intonation parameter of prominence of the aphasic discourse is that of a rising type (r+), and to this type it is attributed communicative value of Interactive nature. This is due to allusions to content shared by the interlocutors that serve as textual anchorage for new information, besides striving to prevent interference, even if partial, from the listener, presupposing prior knowledge and world sharing. This discursive phenomenon was present throughout the whole of the aphasic speech, revealing strategies adopted to maintain dominance of his discourse, as he strives to overcome issues in his language functioning.

We can also claim that in his dialog with non-aphasic subjects the neutral tone pattern appears especially in moments when no information is added or shared as well as in moments when the subject had expresses instability in the use of words, both prolonging and repeating them, hesitating, etc.

Finally, the role of prosodic resources in discursive fragments of aphasic subjects in this research appears as a favorable condition found by this individual to be used when he feels forgetfulness, anxiety, frustration, tension, etc. It also represents a strategy to moments of discontinuity of speech functioning, in pursuit of overcoming difficulties from his condition, particularly in moments when we can observe the strongest pathology features such as amnesic disorders, distorted speech and anomie.

We hope that his study has provided data on the organization of language of aphasic individuals and how the intonation patterns of their discourse is structured, thus contributing to the elaboration of more adequate forms of therapeutic treatment, based on the awareness of the most common difficulties faced by these subjects.

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Feevale

Speech production characteristics of children with phonological disorders

1. Introduction

Phonological disorders are communication disabilities characterized by changes in consonant sounds, which often make the child's speech unintelligible. This disorder may be diagnosed early, but is often detected after the age of 4 years. In these cases, speech therapy is necessary, and a detailed speech evaluation, together with an adequate therapeutic plan, guides interventions and ensures good management. This study was based on descriptions and analyses of phonological disorders of children aged 5 to 10 years. The characteristics of speech articulation and syllabic acquisition are described by comparing the different syllabic structures and the behavior of children when dealing with these targets. Based on the findings, we discuss a possible top-down process of phonological development and the extent to which it may be compared with typical phonological development and other cases of phonological disorders.

2. Phonological acquisition

The typical phonological acquisition of Brazilian Portuguese is completed by about 5 years of age. Until the full stability of the phonological system is reached, some syllabic structures and phonemes are mastered as early as 2 years of age, and others, only close to 4 years.

Some studies evaluated the phonological development of Brazilian-Portuguese-speaking children under the perspective of syllabic acquisition. These findings are reported below in chronological order.

According to Teixeira (1980, 1985), the stages of acquisition of complex onset in Brazilian-Portuguese-speaking children, in cases of both normal and impaired development, were: (i) reduction of the CCV syllable to C'V; (ii) semi-vocalization of the liquids; (iii) moment of confusion about liquids (child replaces the liquid in complex onset); and (iv) correct articulation.

Lamprecht (1990) outlined the normal acquisition of Brazilian Portuguese phonology using a longitudinal corpus of the production of children aged 2;9 to 5;5.

¹ Undergraduate Research Program. We thank FAPERGS for the funding received for the research project *Linguistic variation and acquisition with phonological disorders: questions for social inclusion* [*Variação linguística e aquisição com desvio fonológico: questões para inclusão social*].

She pointed out that the processes of consonant cluster reduction persist beyond the age of 5:2, and reports that the acquisition of clusters with a lateral liquid may happen before that of a cluster with a non-lateral sound, and that this may be explained by individual differences rather than a generic finding. Miranda (1996) studied the acquisition of the 'r' and described the time when the acquisition of the rhotic sounds in different syllabic positions occurs, including in complex onset. She concluded that the 'weak r' in the complex onset is acquired at 3:9. The author found that the following articulations were targets with complex onset: (i) consonant cluster reduction (C'V), 72%; (ii) correct articulation, 25%; and (iii) liquid replacement, only 3%. Moreover, she found that the stressed syllable favors the articulation of these targets, and that girls articulated the CCV syllables correctly more often than boys.

Rizzotto (1997) analyzed the process of syllabic structure in normal development and in developmental phonological disorders in children aged 2:0 to 2:10, and did not find any factors that affected the reduction of complex onset among the study subjects: stress, articulation and voicing of obstruents, number of syllables and position in the word.

Santos (1998) described the longitudinal acquisition of syllabic structures by analyzing data from 3 children and comparing results for European Portuguese and Dutch. The author pointed out that complex onset was the last to be acquired because of its irrelevance in other phonological processes, such as stress.

Magalhães (2000) studied the production of the complex onset composed of a plosive and a non-lateral liquid in the speech of children acquiring language according to the perspective of analysis with trace geometry. The study comprised data from 10 children aged 2 years to 4 years and 6 months. One of the author's findings was that children produce words such as 'trilho' (rail) and 'quadrinho' (comics). If the articulation was C'V, the application of the palatalization rule was examined, because it was a categorical process in the children's language community. The fact that the children did not use the rule indirectly showed the existence of a second consonant in the underlying representation, which blocked the context for palatalization. The same was demonstrated by Matzenauer-Hernandorena (1988) and Ramos (1996). The author also described the acquisition of complex onset groups in the following order: groups with labial obstruents, followed by groups with coronal and, finally, groups with dorsal sounds.

The study conducted by Ribas (2002) shows that there is no order of acquisition of complex onset between the two study groups: obstruent with lateral liquid (e.g., 'planta' {plant}) and obstruent with a non-lateral liquid (e.g., 'primo' {cousin}). An important difference between the two samples, which, however, did not affect the acquisition of CCV, was between the number of lexical items produced in each group, because there is a reduced number with a lateral liquid in comparison with the non-lateral. Moreover, the set of data with the non-lateral liquid also showed greater combinational variability between consonants than the set with lateral liquids. However, this factor is not inherent to the lexicon of children, but, rather, a characteristic of the language.

3. Acquisition in children with phonological disabilities

Children may have an atypical language development because of different etiologies, such as: mental deficiency, hearing disorder, congenital malformations, brain lesions, autism and organic lesions in the articulation organs. However, some children have none of the problems listed above and still cannot complete their phonological acquisition. These children have a disorder that has been named phonological disorder².

The phonological disorder is characterized by the fact that a child produces a different articulation when compared to other children in the same age group; his or her performance is below what is expected for that acquisition time point in terms of sounds and syllabic structures produced in speech.

Grunwell (1990) pointed out characteristics that identify children with phonological disorders and described a set of signs that lead, together with the analysis of the phonological system, to a diagnosis in cases of atypical phonological acquisition. The author pointed out the following factors:

- spontaneous speech with errors in the production of consonantal sounds;
- age greater than 4 years;
- hearing thresholds within normal standards;
- absence of evident neurological abnormalities;
- normal cognitive abilities;
- capacity to understand speech;
- expressive language without change in lexicon and syntax.

In addition to these characteristic, Grunwell (1990) also mentions that disorders may be classified as phonetic, phonological and developmental. Phonetic disorders are associated with a restricted set of speech sounds, whose combinations of phonetic traces and syllabic structures are also restricted. Phonological disorders refer to communication inadequacy because the contrasts necessary for the distinction of meaning are not articulated. The variability in child production, although also seen in normal development, does not produce the expected changes that eventually produce the target system. In cases of developmental disorders, Grunwell refers to the use of persistent normal and/or unusual and idiosyncratic phonological processes; the chronological mismatch between speech and the child age; and the systematic preference for one sound in different targets.

Several studies point to differences and similarities between normal and impaired phonological acquisition. What seems to be evident is that a child with phonological disorders has an incomplete phonological system; its acquisition started but did not follow its usual route, and originated a subsystem of target-language phonemes and

² Different names describe phonological abnormalities in children, and this fact often leads to conceptual differences. In this study, the expression “phonological disorder” will be used to refer to changes only at a phonological level and in an idiopathic context.

syllables. This subsystem is smaller than that acquired by a child that is completing normal acquisition, but it is not totally different.

Therefore, in cases of impaired phonological development, children continue using inadequate standards for their age and for their target-language, characterized by the replacement or non-articulation of speech sounds, which often leads to unintelligible production.

Although children with phonological disorders have acquired a phonological system, maybe incomplete, there is an important difference between atypical and typical acquisitions, which is seen in linguistic variations in both cases. In normal development, there are variations that take place within a pattern of dynamic and rapid change until the stability of the phonological system is reached, and variations occur up to the moment when all the articulations meet the standards of the target language. In phonological disorders, however, there are no great changes in variations because they remain the same for a longer period of time, which delays stability of all the phonological elements and results in speech productions that are not correct.

Data should be studied for that purpose, because the changes in the phonological systems of children with phonological disorders are very slow. Moreover, it is possible to observe up to what point the segments and syllabic structures may stabilize and to assist in understanding how linguistic phenomena (particularly the phonological phenomenon) take place.

Our study first describes the phenomena that occur with children with phonological disorders and the characteristics of speech production of targets that contain consonants in different syllabic positions.

Our descriptions may assist in the comparison of similarities and differences between typical and atypical acquisition processes, and may provide arguments for the discussion about understanding how children process language in terms of the directions of phonological development.

4. Methodology

This cross-sectional study analyzed the data of 39 children aged 5 to 10 years who had phonological disorders. Data was retrieved from the VALDEF database (Speech and Language Therapy Department, FEEVALE), which is made up of several linguistic, auditory and oral-facial movement recordings of children with phonological disorders.

The data extracted from the database referred to syllable production with simple onset, complex onset and coda. No choice was made between the consonants that compose these different syllabic structures, because several segments may occur in these positions. The percentages of correct and expected productions are described for each syllabic type and the three different possibilities are compared.

The speech data that make up the VALDEF database are the results of spontaneous naming elicited using the evaluation instrument developed by Yavas, Hernandorena

and Lamprecht (1991), which is composed of five theme drawings with up to 125 lexical items and contains different segments in all syllabic positions. Structures were classified as acquired if 80% or more correct productions were observed.

5. Speech data: description, analysis and discussion

In this study, analyses focused on word production of target words with consonants in different syllabic structures (simple onset, complex onset and coda). The objective was to demonstrate that children, even when they face difficulties because certain consonants have not been acquired, have a different phonological status determined by the syllable, and not by the segment, in their speech.

Table 1 shows the production percentages of targets with simple onset, complex onset and coda.

Table 1: Percentages of correct productions by study subjects

Subject	1	2	3	4	5	6	7	8	9	10
Simple onset	91%	97%	47%	88%	89%	75%	46%	79%	90%	64%
Coda	88%	83%	42%	71%	68%	94%	12%	93%	78%	69%
Complex onset	60%	10%	3%	0%	0%	60%	0%	19%	0%	10%
Subject	11	12	13	14	15	16	17	18	19	20
Simple onset	70%	77%	97%	87%	57%	97%	82%	88%	53%	88%
Coda	45%	97%	82%	68%	38%	73%	81%	91%	43%	100%
Complex onset	0%	76%	71%	0%	0%	6%	0%	7%	0%	81%
Subject	21	22	23	24	25	26	27	28	29	30
Simple onset	64%	95%	93%	93%	97%	91%	47%	97%	98%	72%
Coda	64%	95%	70%	98%	100%	85%	51%	98%	94%	89%
Complex onset	34%	94%	0%	80%	85%	3%	0%	0%	68%	43%
Subject	31	32	33	34	35	36	37	38	39	
Simple onset	98%	71%	86%	100%	94%	84%	92%	95%	85%	
Coda	77%	74%	94%	95%	80%	80%	97%	83%	100%	
Complex onset	0%	10%	0%	49%	60%	57%	97%	0%	58%	

The table shows that most children (66%; 26 subjects) had 80% or more correct productions with syllables that had simple onset. For the syllables with coda, 23 subjects (58.9%) showed that this syllabic structure was acquired. On the other hand, only 3 had also more than 85% of correct productions for complex onset.

Those subjects that did not have correct productions with 80% or more of all syllables with simple onset (33%; 13 children) also did not have it with complex onset.

Most subjects (92%) with a phonological disorder have not acquired the syllable with a complex onset. Only subjects 22, 25 and 37 had more than 80% correct articulations with this type of syllable, but these children had also already acquired the other syllabic structures. This shows evidence of the implicational laws (DINNSSEN *et al.*, 1990) in the phonological systems of children with phonological disorders: the occurrence of more complex elements implies the occurrence of less complex elements. Our study data, under the perspective of acquisition of different syllabic structures, clearly demonstrate this occurrence in the phonological systems of children with phonological disorders.

Subjects 6, 8, 12 and 30 had unexpected results, as the acquisition of the coda but not of the simple onset was observed. The consonants that may occupy the slot of simple onset are in greater number and may have greater variability than those that may occupy the coda. Therefore, the results for these subjects (who add up to only 10% of all subjects) may indicate instability of certain segments, which suggests that the percentages of production of syllables with simple onset do not demonstrate the acquisition of this structure.

The purpose of this study was to show that the productions by children with phonological disorders also indicate that phonological development is guided by the acquisition of syllabic, rather than segmental, in which some studies described as typical phonological acquisition. According to Ribas (2006), one of the arguments that support the idea that phonological acquisition occurs in a top-down direction is based on the ages of acquisition of liquid sounds during typical development. Such segments occupy the onset and coda positions, and their stability is not reached at the same age, which was demonstrated by Freitas (1998) using acquisition data of normal Portuguese children.

The author gives the example of the phoneme /ʁ/, which has markedly different acquisition ages in each position that it may occupy, as will be seen below. The first acquisition of this phoneme, in data from Brazilian-Portuguese-speaking children, occurs at 3;10 for the coda position, both in the medial and final positions of the word. After that, there is the acquisition of the simple onset at 4;2 and, finally, the mastery of this phoneme in complex onset at 5;0. Therefore, the stability of /ʁ/ depends on the position it has in the syllable, in which the following order of acquisition is found: 1st) medial/ final coda at 3;2; 2nd) simple onset at 4;2; and 3rd) complex onset at 5;0.

The study conducted by Ribas (2006) showed that most study subjects had acquired /l/ in simple onset, but none had acquired it in complex onset. The analysis of /ʁ/ in complex onset revealed that some subjects had acquired this segment in simple onset, but not in complex onset or even in coda. Her data suggest, therefore, that acquisition is guided by the syllable and follows a top-down process, as suggested by Freitas (1998), rather than by the emergence and acquisition of segments, that is, a bottom-up process.

Santos (1998) analyzed syllabic acquisition in 3 children and concluded that it is not possible to define whether acquisition occurs in a top-down or bottom-up process,

and that the hypothesis that children have an innate abstract syllabic structure, as well as a CV sequence input, seems reasonable. Therefore, that author suggests that what the child does is to shape the input to the syllabic structure.

6. Conclusion

This study furthers the discussion about whether phonological development is guided by syllabic acquisition rather than by segmental acquisition. Its results for the phonological system of children with phonological disorders show the same top-down pattern found in typical acquisition.

Future studies should investigate more explicit data and compare the results of syllabic acquisition with segmental acquisition, as this comparison may yield further evidence of a top-down development.

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Metaphor processing and the right hemisphere: A semantic and cognitive interaction

1. Introduction

Currently, with the on-line monitoring of the brain in action, it is known that the left hemisphere of the human cortex is not exclusive to all language functions. Imaging techniques such as computerized tomography and magnetic resonance imaging have helped detect brain regions that are activated during the completion of activities involving language.

Studies involving these techniques have suggested that the right hemisphere is functionally dominant for some aspects of language processing, such as reading pictures, metaphoric appreciation and other semantic functions.

Bottini *et al.* (1994), with the help of Positron Emission Tomography (PET), collected data from neurologically normal adults when they read blocks of literal sentences and metaphorical sentences. When performing the experiment, subjects judged the plausibility of the sentences and reported whether the metaphorical sentences were interpretable or not. The results revealed that both sentences, metaphoric and literal, activated areas in the left hemisphere (prefrontal cortex and basal frontal, inferior temporal gyrus, among others), but in the comprehension process of metaphorical phrases, an increased activation of some areas in the right hemisphere counterparts was noticed.

Rapp *et al.* (2004) used MRI to observe the activation of the hemispheres in terms of understanding the metaphorical and literal sentences. They concluded that the selection of the hemisphere depended on the difficulty required for the task. Keller, Carpenter and Just (2001), in a similar study, indicated that when the literal sentence comprehension demanded greater integration in the lexical and semantic process, the result was an increase in the activation of language areas in the left hemisphere and corresponding areas in the right hemisphere. It seems that the semantic complexity required for metaphorical sentences also induces the selection of areas in the right hemisphere.

Beeman (1998) proposes a theory that relates the cognitive processing of speech with its neural basis that calls “coarse semantic coding hypothesis” the activation that occurs in the right hemisphere of wide semantic fields of words that are remotely related. Therefore, metaphorical processing, would be part of the overall function of this hemisphere, considering that metaphorical comprehension requires some distancing from the concrete meaning of the words that compose it. The possible implications of significance activated in this hemisphere by the relation between the metaphor’s topic and the vehicle is what would stimulate the listener to achieve the meaning proposed by the speaker.

1.1 *Studies with injured subjects*

Adults with right-hemisphere brain damage, many of them due to ischemic or hemorrhagic stroke, can speak fluently and trigger old memories but, often show serious problems into relating long narratives, in establishing associations through metaphors, in giving meaning to anecdotes and puns, into identifying the moral of a story and many other aspects of language (BROWNELL; MARTINO, 1998; JOANETTE; GOULET; HANNEQUIN, 1990).

Winner and Gardner (1977) were among the pioneers who investigated metaphors comprehension with subjects who had brain damaged, using the paradigm of the union between sentences and pictures. These researchers found dissociation between verbal and pictorial conditions in patients with right-hemisphere brain damage, who interpreted metaphors literally when it involved the pictorial task, but when asked to explain them verbally, they interpreted them correctly. Rinaldi, Marangolo and Baldassarri (2002) conducted a similar study, using the same stimuli, but comparing subjects with lesion in the right hemisphere to a group of healthy ones. The results obtained by the researchers corroborated Winner's and Gardner's (1977).

Van Lancker and Kempler (1987), in the comparison of language related skills among patients with right-hemisphere and left-hemisphere injury, found a good performance of both groups in the comprehension of single words. They also observed that patients with right-hemisphere brain damage understood new sentences better, while left-hemisphere brain damage subjects did better with familiar idiomatic phrases.

Brownell *et al.* (1984, 1990), using the paradigm of triads of words, e.g. cold – hateful – warm, asked participants to join words that have the same meaning or that linked better. Semantic relationships between words were based on denotative relations (e.g. antonyms cold and warm), connotative (cold and foolish), metaphorical (cold – hateful) or unrelated (cold and wise). The performance of patients with right hemisphere injury was normal for antonyms combinations, but less than normal for metaphorical equivalence.

The opposite happened to the patients left-hemisphere damaged patients. A possible explanation for this type of deficit may be the difficulty in recognizing and assigning the less frequent meanings of ambiguous words, more than the recognition of metaphorical meanings itself. In line with this reasoning, Gagnon *et al.* (2003) tested metaphorical and not-metaphorical adjectives, although ambiguous. They applied two tests using triad and dual task. On the first one, participants had to identify which adjective had the most similar meaning and, on the second, the plausibility of both words. Compared to the normal group, both right-hemisphere and left-hemisphere injured had difficulty performing the tasks.

In short, these studies suggest that damages to the left hemisphere cause a decrease in sensitivity to the literal aspect of the word's meaning and, increase the dependence of connotative and metaphorical sense. Damages to the right hemisphere, on the other hand, seem to increase the dependence on the literal aspect of words with loss of sensitivity to the metaphoric and connotative aspects.

Note that although the left hemisphere is more effective in many direct tasks of language, both hemispheres process language information, mostly in parallel. At all processing levels, each hemisphere computes the input in its own manner, contributing to understanding in its own way. Thus, this research was to test the hypothesis that semantics and cognitive interaction processes involve metaphor processing in the right hemisphere, since studies point the effective participation of this hemisphere in the comprehension of figurative language.

2. Method

A group of 15 people was examined, 5 right handed with right-hemisphere brain damage in the medium cerebral artery and 10 right handed without any lesion. All had a minimum of eight years education and were between 40 and 55 years of age.

These participants were selected through a questionnaire on medical history, the main purpose of which was to verify the presence of health disorders, such as not-corrected hearing and/or visual disabilities, memory difficulties and depression; and through a mini-mental test to evaluate cognitive abilities – Mini-mental State Examination, Folstein and McHugh (1975).

All five injured subjects were patients of the São José Municipal Hospital, in Joinville-Brazil, victims of a stroke in the cerebral medium right artery at least two months and at most eight since the event, with diagnosis based on neuroimaging techniques and neurological evaluation.

Fourteen metaphorical phrases with a relative degree of conventionality, formed by four or five words, were selected to be part of the instruments to be applied in the research. The Classroom Inclusion Theory of Glucksberg (2001) and studies of Moura (2005; 2006) were chosen as the theoretical basis for metaphors processing. Glucksberg postulates in his theory that metaphors are understood as categorical assertions and, Moura defends that the interaction between the topic and the vehicle is conducted by combinatorial types of lexical nature.

All sentences obeyed the semantic type's combination criteria that appear in the position of topic and vehicle, following Moura's proposal (2005) and, were of type "X is Y".

The subjects were examined at three distinct moments. On each occasion, they were asked to perform a task of metaphor comprehension. The first task consisted of free metaphor comprehension. The second consisted of metaphor comprehension according to options offered, both based on the subtest Metaphor Comprehension Task of Montreal Evaluation of Communications Scale (MEC), by Côte *et al.* (2004). And task three included metaphor comprehension, time of reply and visual field.

The data was gathered individually, according to the following criteria.

In the first meeting, the written instructions for the first comprehension activity were given to the participants, who read them silently. After reading it, the researcher questioned the instructions comprehension and put herself at their disposal for any clarification. Then, there was a brief practicing session with six metaphors that were

not part of the ultimate test, so that the task execution comprehension could be checked. Afterwards, participants were presented the fourteen sentences with metaphors “X is Y”, one at a time, individually written on a card. After silent reading and speaking aloud each of them, they verbally explained the phases in their own words. The answers from this task were registered by a digital recorder and later transferred to a computer.

The second comprehension activity was given 48 hours after the first one. The time frame established between the tasks applications was intended to disseminate any influence between the answers given in task 1 and the ones that would be as alternatives in task 2.

Written instructions were given to the participants, who were allowed, after silent reading, to question the researcher if necessary. In this second task, all fourteen metaphoric phases were presented again, one at a time, written on a card. The participants were instructed to read them silently and aloud. After reading aloud, the researcher presented a new card, with three possible explanations for each metaphor that was read. It was up to the participants to choose the best explanation for the phrase’s meaning. A training exercise was conducted right after reading the instructions, using the same criteria as the main activity, and using the same six training-phrases from the previous task.

Forty-eight hours after task 2 was given, the third stage of data collection took place, in which the participants answered the last comprehension activity in the computer. Written instructions for this task were given to the participants, and questions were answered by the researcher. Initially a phrase was presented to the participants on the screen for 2500ms. Then, an incomplete explanation of the phrase was shown on the screen for 2000ms disappearing right after that. Soon after, three words that could finish the phrase were individually shown on the screen. Each word appeared randomly for 1000ms, at times on the right side of the screen and at times on the left side. The participants were asked to briefly decide whether it completed properly the initial sentence’s meaning or not.

With their index finger, they pressed the YES button in green, when they agreed the relation was pertinent; when it was not so, they pressed the NO button, in red. The YES and NO buttons were featured on a mouse attached to a mouse pad placed in front of the participant. They had 2000ms to choose YES or NO once the word disappeared from the screen. In case they did not answer during the given time, they lost the chance to do so, and a new word would come up on the screen. Between the phrases and the words, a cross was shown in the middle of the screen for 1500ms. Before the beginning of this activity, they trained with the six training-phrases used on the two previous activities, which were repeated as often as needed until they felt ready to take the final test.

3. Results

Initially, a descriptive analysis of the data was made in table format of averages and standard deviation for the sample’s performance variables, considering at first all metaphors (first analysis) and then each one individually (second analysis).

To compare the three tests in relation to the total score obtained on each task in the first analysis, a test *t* was used. For the second analysis, metaphor by metaphor, a binomial nonparametric test was processed. A confidence interval was used for the difference of the averages of 95% and a significance level inferior to 0,005, so that the differences were significant, promoted a comparison between the groups, through test *t* of differences for independent samples and the accurate test of Fischer. Besides this comparison among groups, a comparison was proposed between the performances in the different aspects of task 3 by group, through test *t* for paired samples.

3.1 Data presentation for test 1

The free metaphor comprehension test was a non-controlled task that required an oral explanation of the metaphors that were read. The answers obtained were converted into numerical measures according to the following classification: *appropriate* (1), *inappropriate* (2) and, *did not interact* (3). The answers considered appropriate were the ones that met Moura's proposal (2005). To examine the data statistically, the *inappropriate* (2) and, *did not interact* (3) were grouped together.

Table 1: Presentation of appropriate answers for test 1

1. Topic (institution/place) – Vehicle (institution/place)

The relevant property of the vehicle in this type of metaphor is the role played by the Y institution.

Metaphors

This university is a madhouse.
My house is a hotel.
This city is Disneyland.
My job is a prison.

Adequate answers

to shelter disoriented people.
to host people.
to provide fun.
to deprive of liberty.

2. Topic (device) – Vehicle (human properties)

The topic relevant dimension is the device function.

Metaphor

My computer is temperamental.

Adequate answer

unstable, works whenever.

3. Topic (being human) – Vehicle (substances property)

The relevant dimension of the topic is the personality or the temperament of the referring human.

Metaphors

Peter is a bitter guy.
Ricardo is a sweet guy.

Adequate answers

moody, annoying, rude.
gentle, nice, good person.

4. Topic (human being) – vehicle (device name or property)

- a) The topic relevant dimensions are the ability and the appearance of who is being spoken about.
- b) There are usages of this type of metaphor that highlight moral qualities.

Metaphors

Marta is a rocket.
This woman is tuned up.
Carla is a multimedia woman.
My cousin is a fridge.
Paul is a tractor.
Mary is a robot.
Paul is a bag.

Adequate answers

fast, energetic, determined
has breast implants, voluptuous, dynamic person
versatile, informed, intelligent.
cold (with no feelings), fat
good worker, uncivil, rough
has no personality, good worker, has no emotions.
annoying, unbearable

Source: Research data

Table 2 displays the final result of test 1, with the numbered attributions already preset.

Table 2: Results of test 1

Participants	Metaphors													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	2	1	1	1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1	1	1	1	1	1	1	2
3	1	1	1	1	1	1	1	1	1	1	1	3	1	1
4	2	1	2	1	1	1	2	1	2	1	2	2	2	2
5	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7	2	1	1	1	1	1	1	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1	1	1	1	1	1	2	1
9	1	1	1	1	1	1	1	1	1	1	1	1	3	1
10	2	1	3	1	1	2	1	1	1	1	1	1	1	1
11	1	1	2	1	3	1	1	3	1	2	1	1	1	1
12	1	1	1	1	1	1	1	1	1	1	1	1	3	1
13	2	2	3	2	1	3	2	2	1	2	2	3	3	1
14	1	2	1	1	1	1	1	1	1	1	2	2	3	2
15	2	2	2	2	1	1	1	2	1	1	1	1	3	1

Source: Research data.

It shows a very homogenous result of the participating groups.

3.2 Data presentation for test 2

The comprehension task proposed by test 2 required the participants to identify the answer that better explained the metaphor that was read. They were to choose only one from three options. The chosen answers were classified as follows: *appropriate* (1), *distractor* (2), *not appropriate* (3) and, *did not interact* (4). The *distractor*, *not appropriate* and, *did not interact* answers were grouped together so that the data could be run statistically.

Table 3: Presentation of appropriate answers for test 2

Metaphors	Adequate answers
1. This university is a madhouse.	() Has weird people.
2. This woman is tuned up.	() She has breast implants.
3. Carla is a multimedia woman.	() She completes many activities at the same time.
4. My cousin is a fridge.	() She is conservative in her relationships.
5. Paul is a tractor.	() He is rude to people.
6. Marta is a rocket.	() She is very energetic.
7. Peter is a bitter guy.	() He is always in a bad mood.
8. Paul is a bag.	() He is an annoying guy.
9. Ricardo is a sweet guy.	() He is nice.
10. Maria is a robot.	() She does everything perfectly.
11. My house is a hotel.	() It is always open to people.
12. This city is Disneyland.	() It offers many options for fun.
13. My computer is temperamental.	() It works every once in a while.
14. My job is a prison.	() It is exhausting.

Source: Research data.

Table 3 displays the final result of test 2, with the numbered attributions already preset.

Table 4: Results of test 2

Participants	Metaphors													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11	1	1	4	1	4	1	1	1	1	1	1	1	1	1
12	1	1	1	1	4	1	1	1	1	4	1	1	4	4
13	4	4	4	4	4	4	4	4	1	4	1	4	4	1
14	3	2	1	3	2	3	1	3	2	3	1	2	2	1
15	1	2	2	1	1	1	1	1	1	1	1	1	2	1

Source: Research data.

It is possible to note that the majority of the answers were the appropriate one. However, five participants opted sometimes not to choose any alternative. It is possible that their behavior is related to their being patients with lesions. In the studies already reported here, there is an unsatisfactory performance of subjects with right-hemisphere damage compared to experimental stimuli using forced-choice paradigms. The success of the task proposed by test 2 depended on the correct option among the three given and, it seems that those subjects had difficulties rejecting the alternative meanings.

3.3 Data presentation for test 3

On the comprehension task of test 3, the divided visual field technique was used. Because it also presented three possible answers, the analysis followed same classification as in test 2. Data referring to the answer quality and visual field were run statistically. Yet, data referring to reaction time and type of answer could only be analyzed qualitatively, since the number of participants precluded the application of statistical tests that pointed out significant data.

Table 3: Presentation of appropriate answers for test 3

Metaphor	Explanatory phrase's beginning	Answers
This university is a madhouse.	People there are	weird
This woman is tuned up.	She has	breast implants
Carla is a multimedia woman.	She completes at the same time many	activities
My cousin is a fridge.	She is	conservative
Paul is a tractor.	He is	rude
Marta is a rocket.	She is	energetic
Peter is a bitter guy.	He is	moody
Paul is a bag.	He is	annoying
Ricardo is a sweet guy.	He is	nice
Maria is a robot.	She is	perfectionist
My house is a hotel.	It is	welcoming
This city is Disneyland.	It is	fun
My computer is temperamental.	It is	unstable
My job is a prison.	It is	exhausting

Source: Research data.

The table below shows as example the collected data from test 3 for Metaphor 1.

Table 4: Results of test 3

METAPHOR 1				
Participant	Visual field	Reaction time	Type of answer	answer quality
1	Right	1781	yes	expected
2	Right	2672	yes	expected
3	Right	1954	no	not expected
4	Right	2437	yes	expected
5	Right	2089	yes	expected
6	Right	1422	yes	expected
7	Right	2813	no	not expected
8	Right	1250	yes	expected
9	Right	1531	yes	expected
10	Right	1488	yes	expected
11	Right	1156	yes	expected
12	Right	1359	yes	expected
13	Right	did not interact	did not interact	
14	Right	1875	yes	expected
15	Right	1938	no	not expected

It can be seen that there was considerable homogeneity among fourteen participants. Only subject 13 clashed with the others. During the application of the test he showed total disinterest in accomplishing the tasks and did not interact in thirteen of fourteen metaphors tested.

4. Final Considerations

As already discussed by Rinaldi, Marangolo and Baldassarri (2002) and Winner and Gardner (1977), this research confirmed the satisfactory performance of subjects with right-hemisphere brain damage in verbal explanations of metaphorical sentences. We can see that they do not show a significant deficit in free metaphor comprehension tasks. The problem arises when meaning associations are needed, recognizing less frequently meanings of ambiguous words (BROWNELL *et al.*, 1984, 1990, GAGNON *et al.*, 2003). This was observed in tasks 2 and 3, in which injured participants rejected the meaning suggested by the experimental stimuli as not being considered the most important in his/her linguistic universe. Personal, general and linguistics knowledge, seem to lead their inferences and block out other possible associations, so that they do not accept possible alternatives interpretations. It is necessary to consider these particularities when asking these subjects metaphorical expressions interpretation, before categorizing their performance on figurative language understanding.

The tasks implemented in this study, generally show that individuals with right-hemisphere brain damage, specifically in the middle cerebral artery can interpret metaphors. The fact that they responded efficiently to task 1, free metaphor comprehension, shows that they can go beyond the **literal meaning** of a sentence. The significant differences found in tests 2 and 3 suggest that the injury does not indicate linguistic deficit but, the usage of cognitive strategies that rely on inferences that depend on the individuals' general and linguistic knowledge, which might often not be the same as the speaker. This was evident on the metaphor comprehension task for the options given, where they showed they did not accept the options that presented new associations to the metaphor tested, as they were different from the ones normally used by them, which does not mean a non-interpretation of metaphors.

The results of this research lead us to the following inferences: a) metaphor comprehension is not totally abolished in subjects with right-hemisphere brain damage. Even though they show a lower performance compared to the control-group, most of their answers on all three tests were correct. In this sense, this study mirrors those by Rinaldi, Marangolo and Baldassarri (2002) and Winner and Gardner (1977) b) the deficit in metaphors comprehension was not indiscriminate, but strongly dependent on the stimuli. In fact, these patients were more affected when faced with forced choice stimulus material (tests 2 and 3) and, c) To explain the dissociation in the performance for all three tests, it is hypothesized that subjects with right-hemisphere brain damage present deficits integrating information when it should be associated with significant pre-set options.

In order to accomplish a more detailed analysis of the communicative performance of subjects with right-hemisphere brain damage, relating to metaphor processing, it is necessary to continue this study. To further investigate the suggested trends, it is intended to promote longitudinal researches, with the observation of quantitative and qualitative aspects presented in these subjects' responses to tasks of metaphors comprehension.

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