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**3rd ANPOLL Intl
Psycholinguistics Congress :
Domain Specificity in Language
Acquisition and Processing**

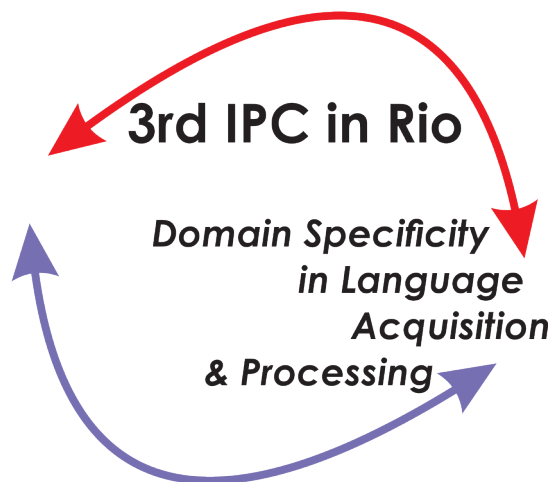
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16-24 Mar 2015
Brazil


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The Third ANPOLL International
Psycholinguistics Congress:
Domain Specificity in Language
Acquisition and Processing

Rio de Janeiro, Brazil, 16-24 March 2015



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Program

School of Advanced Studies	Lecture	Short Talks	Panel Discussions	Breaks	Posters
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	Mon March 16th PUC-Rio	Tue March 17th PUC-Rio	Wed March 18th UFRJ	Thu March 19th UFRJ	Fri March 20th PUC-Rio	Mon March 23rd PUC-Rio	Tue March 24th PUC-Rio
9:00	Wolfram Hinzen (ICREA/ U.Barcelona)	Anna Maria Di Sciullo (UQAM, Canada)	Anna Maria Di Sciullo (UQAM, Canada)	Rushen Shi* (UQAM, Canada)	Robert Berwick (MIT, USA)	Robert Berwick (MIT, USA)	Colin Phillips (U. Maryland)
10:45	Coffee Break	Coffee Break	Coffee Break	Coffee Break	Coffee Break	Coffee Break	Coffee Break
11:00	Wolfram Hinzen (ICREA/ U.Barcelona)	Anne Christophe (ENS, France)	Anne Christophe (ENS, France)	Rushen Shi (UQAM, Canada)	Randy Gallistel (RuCCS, USA)	Randy Gallistel (RuCCS, USA)	Colin Phillips (U. Maryland)
12:45	Lunch Break	Lunch Break	Lunch Break	Lunch Break	Lunch Break	Lunch Break	Lunch Break
14:00	Thierry Nazzi (CNRS, France)	Michael Skeide (MPI, Germany)	Emmanuel Dupoux (ENS, France)	Rushen Shi (UQAM, Canada)	Marcela Peña (PUC, Chile)	Rochel Gelman (RuCCS, USA)	Marina Nespor (SISSA, Italy)
15:00	Short Talks	Poster Session A	Short Talks	Short Talks	Short Talks	Poster Session B	Short Talks
16:00	Wolfram Hinzen (ICREA/ U. Barcelona)	Coffee Break	Coffee Break	Coffee Break	Coffee Break	Coffee Break	Coffee Break
16:15		Ruth Lopes (UNICAMP, Brazil)	Anna Maria Di Sciullo (UQAM, Canada)	Anne Christophe (ENS, France)	Randy Gallistel (RuCCS, USA)	Colin Phillips (U. Maryland, USA)	CONGRESS CLOSURE
17:00	Coffee Break						Anne Christophe (ENS, France)
17:30	Brazilian Music Duet with <i>Gabriel Improta</i> & <i>Dirceu Leite</i>	Cristina Name (UFJF, Brazil) Thais Cristófaró (UFMG, Brazil)	Michael Skeide (MPI Germany) Ronice Quadros (UFSC, Brazil)	Alejandrina Cristiã (CNRS, France) Emmanuel Dupoux (ENS, France)	Robert Berwick (MIT, USA) Cilene Rodrigues (PUC-Rio, Brazil)	Marcus Maia (UFRJ, Brazil) Leticia Sicuro Corrêa (PUC-Rio, Brazil)	& Jacques Mehler

* Professor Rushen Shi will be substituting Professor Takao Hensch, who canceled his participation on account of health problems in the family

Posters

TUESDAY
March, 17th

Poster Session - A

- 15:00 **Poster Program -**
Salão da Pastoral da PUC-Rio
PUC-Rio's Sacred Heart Church
- 1 **Simultaneous interpreting in High and Low Working Memory Span Interpreters, and their ability to cope with the Articulatory Suppression Effect**
Irene Injoque-Ricle, Juan Pablo Barreyro, Jesica Formoso, Andrea Alvarez Drexler, Virginia Jaichenco
- 2 **Prosodic Boundaries on Lexical Access by Speakers of Brazilian Portuguese as L2**
Vanessa Araújo, Daniel Pereira Alves, Maria Cristina Name
- 3 **The effect of cross-language form similarity on bilingual children's word recognition**
Ana Beatriz Arêas da Luz Fontes, Brentano Luciana, Ingrid Finger
- 4 **Bilingualism as a potential source of cognitive reserve**
Johanna Billig, Ana Arêas da Luz Fontes, Ingrid Finger
- 5 **Revisiting the so-called Bilingual Advantage with the ANT Task**
Marcia Zimmer, Lisandra Rodrigues
- 6 **Differences between Elderly Bilingual and Monolingual individuals regarding Executive Functions, Working Memory and Long-Term Memory**
Sabrine Martins
- 7 **Bimodal bilingualism: a study of lexical access in Brazilian signed language interpreters**
Sandro da Fonseca, Ana Fontes, Ingrid Finger
- 8 **Is PraSLI the same as PLI? On the possibility of selective impairment at the grammar-pragmatics interface and its relation to learning disability**
Jacqueline Longchamps
- 9 **The universality of motherese prosodic characteristics**
Erika Parlato-Oliveira, Catherine Saint-George, Mohamed Chetouani, Jean-Maximilian Cadic, Sylvie Viaux, Lisa Ouss, Ruth Feldman, Filippo Muratori, David Cohen

- 10 **Brazilian Portuguese adults use intonational phrase boundary cues on syntactic processing**
Michele Souza, Aline Fonseca, Maria Cristina Name
- 11 **Bimodal Bilingualism: Analysis of the narratives of children of deaf parents**
Bruna Neves, Ronice Quadros
- 12 **Phoneme discrimination in Libras/Portuguese and ASL/English by bimodal bilingual children and deaf child users of cochlear implants**
Laura Kozak, Carina Cruz, Aline Lemos, Ronice Quadros, Deborah Chen Pichler, Diane Lillo-Martin
- 13 **Development of Person Distinctions in the Pointing of Bimodal Bilingual Children**
Kadir Gokgoz, Ronice Quadros, Janine Oliveira, Diane Lillo-Martin
- 14 **Recognition of own name, for babies from 6 to 7 months old**
Aline Lucena, Cynthia Nascimento, Nárlí Machado-Nascimento, Patrícia Ferreira, Renato Alves, Sirley Carvalho, Walter Junior, Erika Parlato
- 15 **Vowel harmony and vowel raising: Evidence from Acquisition**
Graziela Bohn
- 16 **Self-assessment of language proficiency: a study of the relation between academic education and sign language proficiency of hearing teachers**
Martins Vinicius, Ingrid Finger
- 17 **The role of context and syntax on co-reference**
Ana Machado, Aniela França
- 18 **Discrimination of Brazilian Portuguese open-mid vowels and close-mid vowels by native speakers of Argentine Spanish: A perceptual study**
Reiner Perozzo, Juliana Feiden, Ingrid Finger, Ana Beatriz Arêas da Luz Fontes
- 19 **Word Order comprehension in Brazilian infants**
Leticia Kolberg
- 20 **Text Comprehension: The presentation of texts in different modalities and its relation to Memory**
Talita Gonçalves
- 21 **Agreement processing in Brazilian Portuguese**
Késsia Henrique, Cristina Azalim, Mercedes Marcilese, Maria Cristina Name

- 22 **The production of long distance WH-Questions in Brazilian Portuguese by typical developing children and children with Specific Language Impairment**
Maria Valezi, Elaine Grolla
- 23 **Acting-Out the concept of a novel verb and its inflectional variations: A preliminary study with four-year-old Brazilian children**
Daniele Molina, Cristina Name
- 24 **The comprehension of passive sentences in terms of exclusive syntactic cost and discourse continuity: implications for Language Acquisition**
João Lima Jr
- 25 **The Perception of Rhythmic speech: Dyslexia and Musicality**
Natalie Boll-Avetisyan, Anjali Bhatara, Barbara Höhle
- 26 **Individual differences in inference generation during expository text comprehension: Working Memory and Prior Knowledge**
Juan Pablo Barreyro, Irene Injoque-Ricle, Jesica Formoso, Andrea Alvarez Drexler, Débora Burin
- 27 **Prosodic Boundaries Help Infants Learn Non-Adjacent Dependencies in Natural Language**
Milene Laguardia, Elsa Santos, Rushen Shi & Cristina Name
- 28 **Early development of turn taking in vocal interaction between mothers and infants**
Maya Gratier, Emmanuel Devouche, Bahia Guellai, Rubia Infanti, Ebru Yilmaz, Erika Parlato
- 29 **Learning human words**
Fabio Mesquita
- 30 **The use of prosody cues in the sentence structure: A study about Topic and Subject Structures in Brazilian Portuguese**
Aline Fonseca, Ana Carolina Brandão
- 31 **Construal of Relative Clauses: an investigation on the Referentiality Principle in Brazilian Portuguese**
Gitanna Bezerra, Márcio Leitão
- 32 **Translation of a Linguistic Working Memory Task**
Kelvin Magagnin, Pietra Cassol Rigatti, Ana Arêas da Luz Fontes, Ingrid Finger
- 33 **Past time reference in non-fluent Aphasia**
Juliana Feiden, Ingrid Finger

TUESDAY
March, 23rd

Poster Session - B

Poster Program

15:00

Salão da Pastoral da PUC-Rio
PUC-Rio's Sacred Heart Church

1

A study of monolingual and bilingual children on the stroop test
Marta Bandeira

2

Individuate, then measure: on the acquisition of container phrases in English
Suzi Lima, Jesse Snedeker

3

A comparative study about metacognitive language transfer on reading comprehension strategies in Brazilian Portuguese and in English as a second language
Diane Blank Bencke

4

The Learnability of the resultative construction in English L2: A comparative study of two forms of the acceptability judgment task
Candido oliveira, Ricardo Souza

5

The acquisition of coordination of PPs and the acquisition of recursion of PPs: how to fare the development of these computations?
Mayara Pinto, Aleria Lage, Aniela França

6

Comparing good and poor readers' comprehension
Lucilene Bender de Sousa, Lilian Hübner

7

Transfer of the Iambic-Trochaic law across auditory domains in infants
Julia Franzoi, Caterina Marino, Alan Langus, Marina Nespor

8

Depth of encoding through gestures in foreign language word learning
Manuela Macedonia

9

The effect of educational level on semantic processing
Bruna Tessaro, Lilian Hübner

10

Oral narrative production and referentiation in Alzheimer's disease
Rafaela Janice Boeff de Vargas, Lilian Hubner

11

The processing of gender transparent and gender opaque nouns in Brazilian Portuguese: an event-related brain potential study
Natalia Resende, Mailce Mota, Aline Gesualdi Manhães, Daniel Acheson

- 12 **Investigating animacy hierarchy: A psycholinguistic study**
Tainá Andrade, Nathacia Ribeiro, Aleria Lage
- 13 **Developing a language background questionnaire for research with bilinguals**
Ana Scholl, Ingrid Finger
- 14 **Recursion through Prosody: A psycholinguistic study**
Nathacia Ribeiro, Aleria Lage
- 15 **Reading fluency in a group of spanish speaking children**
Mariela Vanesa De Mier
- 16 **Probabilistic factors in spoken language production: A corpus study of Russian speech errors**
Svetlana Gorokhova
- 17 **Does the acceptability judgment performance distinguish between low and high L2 proficiency?**
Jesiel Silva, Ricardo Souza, Alexandre Santos
- 18 **Null and Resumptive pronouns in Left-Dislocated structures in BP: Adults responses in a picture matching task**
Flavia Mello, Marina Augusto
- 19 **The causative alternation in the Maxakali language**
Silvia Pereira
- 20 **An ERP study of the Karaja distributive Sohoji-Sohoji**
Cristiane Oliveira da Silva, Marcus Maia, Aniela Improta França, Juliana Novo Gomes, Daniela Cid de Garcia, Aléria Cavalcante Lage
- 21 **Filled gap effects and selective fallibility in Brazilian Portuguese sentence processing**
Amanda Moura
- 22 **The role of the order of referentially dependent elements on coreference resolution in Brazilian Portuguese**
Priscila Lessa
- 23 **Attraction errors in case agreement: evidence from Russian**
Anya Stetsenko, Natalia Slioussar, Tatiana Matushkina
- 24 **The cognitive processing of syntactic information: a study of relative clauses with subject and object extraction in Spanish**
Laura Manoiloff, Maria Constanza Carando, Maria Cecilia Debagó, Laura Alonso Alemani, Cecilia Ferrero, Daiana Cesaretti, Adrián Ramirez, Juan Segui

- 25 **An HPSG Analysis of the Spanish Inchoative Markers 'se' on the Interlanguage of English and Brazilian Portuguese Speakers- Psycholinguistic Evidence**
Raquel Lawall
- 26 **The one step anaphor processing in Brazilian Portuguese**
Elisângela Teixeira, Márcio Leitão, Rosana Oliveira, José Ferrari Neto, Dorothy Brito
- 27 **Focus Constructions and Cognitive Complexity: evidence from a priming experiment**
André Felipe Cunha Vieira, Diego Leite de Oliveira, Katharine F. P. N. A. da Hora, Cassiano do Carmo Santos, Simone Silva de Oliveira, Solange Passos, Tatiana Raick Kuczmenda, Maria Braga
- 28 **Pronominal resolution processing in complex structures in Brazilian Portuguese (BP)**
Katharine Hora
- 29 **Phi-feature interaction in processing: evidence from Russian**
Natalia Slioussar, Natalia Cherepovskaia
- 30 **The processing of gender and number agreement features and structural constraints in pronoun resolution in Brazilian Portuguese**
Michele Alves
- 31 **Domain Generality of Learning Non-Adjacent Dependencies: Evidence from Visual Stimuli**
Jia (Vivian) Li, Justin Wood, Toben Mintz

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Variation in Child Language

Mary A. Kato (UNICAMP/CNPq)

Contact: mary.kato@gmail.com

According to Dresher (1999) and others, children do not reset the value of parameters. However, in a scenario where changes in syntax occur, variation and optionality in the community is expected to take place (Lightfoot 1991). The aim of this talk is to study cases of syntactic change and variation in adult Brazilian Portuguese, and to see how Brazilian children react to competing grammars. We will examine two cases of syntactic change, namely the change in the Null Subject Parameter and the change(s) in wh-question constructions. The first case corroborates Dresher's (1995) assumption as no variation is found in the child's core grammar, though variation between null and overt subjects are found in the community (cf. Magalhães 2003), while in the case of wh-questions the child's early grammar reflects the variation found in the adult (cf. Lessa 2003), confirming Yang's (2002) hypothesis. In this talk we will try to solve the reason of this difference.

BECOMING BIASED : EARLY ACQUISITION OF THE CONSONANT BIAS IN LEXICAL PROCESSING IN FRENCH

Thierry Nazzi

LPP, Université Paris Descartes, Sorbonne Paris Cité and CNRS

Following the proposal of a functional dissociation in language processing, according to which consonants would be given more weight than vowels in lexical processing, and vowels would be given more weight than consonants in prosodic/syntactic processing (Nespor et al., 2003), we investigated the proposed consonant bias at the lexical level both from a crosslinguistic and developmental perspective. Crosslinguistically, while the C-bias was found to be pervasive in French, different patterns were found in other languages, with a later emergence of the C-bias in English and the observation of a V-bias in Danish toddlers. This variation suggests that the originally proposed C-bias is language-modulated. Developmentally, three lexically-related studies focusing on French-learning infants between 5 and 11 months suggest that these infants switch from an early V-bias around 5/6 months of age to a functional C-bias around 8/11 months. We will discuss several hypotheses that might explain these developmental changes.

ERP EVIDENCES OF SYNTACTIC CATEGORY FAST PROCESSING

Brusini, P., Nespors, M. & Mehler, J.

Language, Cognition and Development Lab, SISSA

Is a word inherently linked to its syntactical category? If so, what about ambiguous words (as in dream_{N/V}), do they have a default category? Recent studies showed that adults recruit different brain areas when processing nouns and verbs: while regions close to the visual cortex are involved in object referent processing (i.e. nouns), pre-frontal regions next to the motor cortex are activated when decoding action referents (i.e. verbs), however there is no existing data on how adults process ambiguous words (Shapiro and Caramazza, 2003). The main goal of this study is to determine whether the syntactical features of words are accessed during on-line word recognition and to determine how ambiguous words impact the speech system processing.

We collected EEG measure while 13 Italian adults listen five CVCV words, four (all nouns or all verbs) precursors, preceded the test stimuli. This fifth test word could either match the category of its precursors (Same condition) or belonged to an unambiguous different category (Different condition) or be an ambiguous word that can be analyzed as a noun or a verb (Ambiguous condition, see table table 1). Previous work using this paradigm reported a Mismatch Negativity (MMN) – a component reflecting an automatic detection of perceptual change (Näätänen et al., 2012; Pulvermüller et al., 2008).

Comparing the Different/Same conditions, we extracted a time/channels of interest presenting a central negative component elicited 200ms after the offset of the critical stimulus ($t(1,12)=3.61$ $p < 0.01$ see plot of this effect on figure 1 left). This cluster (in the 200-350ms time window and recorded by the central electrodes) was used in a variance analysis, with Context (noun/verb) and Condition (noun/verb/ambiguous) as within factors. This analysis revealed a significant Context x Condition interaction ($F(1,12)=5.557$ $p=0.01$, see figure 1 right).

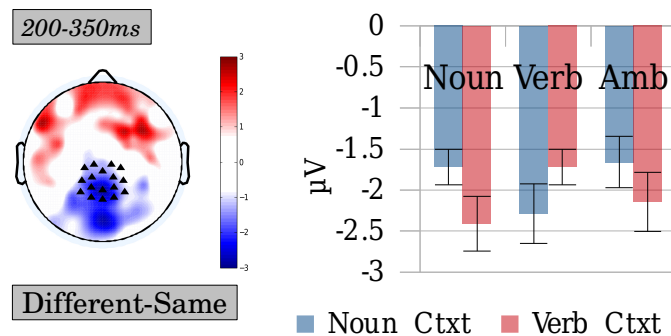


Figure 1: Right part: Statistical maps of the significant differences for each electrode between the condition Different Vs Same during the 200-350ms time window. Left part: bar plot of the average data recorded for each context and for each category of critical stimulus.

	Precursor1	Precursor2	Precursor3	Precursor4	Critical	Category
Context Noun	la bocca	la casa	la torta	la pancia	la mela	→ Noun
					la vedi	→ Verb
					la cura	→ Ambiguous
Context Verb	la bagna	la stira	la varia	la guarda	la mela	→ Noun
					la vedi	→ Verb
					la cura	→ Ambiguous

Table 1: TABLE CONDITION. Three different critical words were used by category. Each words composing the context were different and semi-randomly picked among 5 words (5 nouns and 5 verbs).

The category of the critical words was processed differently by adults depending on the context of presentation. Moreover, the ambiguous words tend to behave as nouns, presenting no modification of activity in the Noun-context but with a more negative activity when presented after verb. This should be confirmed with more subjects, but suggest that ambiguous words have a default noun category. Overall the latency of these effects show that the integration of a word goes along with the access to its category.

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Language, Self, and Mental Health

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Classical generative grammar, conceived as a form of ‘Cartesian Linguistics’ (Chomsky, 1966) methodologically abstracted from the connection that language has with thought, studying it formally as a separate system in its own right. This didn’t prevent matters of content from arising, and recently a view has gained momentum according to which the generative system underlying human language *is* the generative system underlying human thought, insofar as it is species-specific. Yet how can the study of grammar be the study of a thought system, and provide a theory of thought?

It can if *Homo sapiens* engages in a peculiar form of conscious thought that is uniquely linguistic, with the basic organizational principles of grammar determining those of this mode of thought, which we do not find in non-grammatical species. Whatever we think of ‘non-linguistic thought’, and whatever ‘language of thought’ exists without ‘real’ language, such thought is different. Language might make this difference.

But how? Grammar might give our minds meanings to think that would not exist without it, and empirically *do* not seem to exist without it. In these two sessions I introduce this new concept of ‘Un-Cartesian Linguistics’ to shed light on how defining features of human-specific thought *can* actually fall out from grammatical organization, with a focus on how this is true for our sense of selfhood.

Selfhood has been taken as constitutive for any form of rational thought since Kant, who maintained that all thoughts must be subordinated to the ‘Ich denke...’ (I think that...). Along with Kant, a long tradition has taken personal-pronominal forms of self-reference to be essential and irreducible to one kind of selfhood as such. This invites renewed reflection on the cognitive significance of grammar, and it makes predictions for the linguistic profile of patients with problems of mental health that present with disturbances of the self.

In line with these predictions, the pronominal system *is* specifically affected in cognitive disorders such as autism and schizophrenia, and I will develop this point into a more systematic assessment of the role of language in these cognitive disorders, with a focus on schizophrenia. Language disturbances lie at the core of the psychopathology involved, and in turn, for almost a century schizophrenia has been described as a disturbance of selfhood (ipseity). The question is how these two facts relate.

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The ontogeny of the cortical language network

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Language comprehension comprises complex cascades of bottom-up mechanisms triggered in the temporal cortices and subsequent top-down mechanisms generated in the inferior frontal cortices. Phoneme discrimination capacities are already evident in utero and basic language skills develop rapidly in the first three years of life. However, the refinement of syntactic computation and semantic evaluation mechanisms continues into young adulthood. In this talk, I outline how the functional and structural maturation of a temporo-frontal neural network drives human language acquisition.

Now it is, now it isn't: article omission in the early grammar of a DP/NP language

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Article omission by young children has suggested that the DP layer is universally lacking in early grammars. However, this view has been challenged by many who show that an NP-only stage is not to be found in early grammars (see Bohnacker, 1997; a.o.). Nevertheless, there are language specific differences. Guasti et al. (2008), comparing the acquisition of Romance languages to Dutch, show that children acquiring Dutch tend to drop articles twice as much as children acquiring Romance languages for a longer period of time. According to them, this difference is due to the fact that Germanic languages allow for bare nouns in a broader range of contexts.

In this respect, Brazilian Portuguese (BP) becomes an interesting language to be examined, since it allows bare nouns (singular or mass), bearing generic or existential readings, as well as a full definite and indefinite article paradigm. Having both DPs and NPs as grammatical options in the language, children acquiring BP should pattern with those acquiring Dutch and not with the ones acquiring Romance languages; in other words, BP-acquiring children should be misled by the broader contexts that allow for the lack of overt articles in the input. In order to test that, spontaneous production of 4 children, aged between 1;07 and 4;09 were examined. An NP-only stage was not attested. Even in the first files examined, children used articles in an adult way as well as dropped them in obligatory contexts. The figures varied from 50% of article omission in the first files to 25% around their second birthday (8983 DPs/NPs analysed, sd for overt Ds = 1.39 and 1.41 for the dropped ones). The average rate of article omission among the four children is 15.6%. Our results, therefore, show that even in DP/NP languages, children are not misled by the input and seem to grasp quite early the specific contexts in which articles have to be overt.

Non-adjacent dependencies and prosodic boundaries in grammatical categorization: specialized mechanisms on language acquisition

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Results from artificial language experiments showing infants' ability to track non-adjacent dependency patterns and to generalize them to new stimuli are used to be interpreted as dependent to domain-general mechanisms, such as statistical and distributional ones. However, following Gervain & Mehler 2010 proposal of an integrative theory of language acquisition, I argue that these mechanisms may have a specialized role in natural language learning.

I present some experimental results showing that, after a brief exposure to a pseudo-language, Canadian or Brazilian 11-month-old infants: (i) are sensitive to non-adjacent dependencies between determiners and word markers, (ii) use phonological phrase boundaries to acquire syntactic regularities and (iii) are able to assign novel words into grammatical sub-categories.

On the dynamics of child language acquisition: complex onsets in Brazilian Portuguese

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This paper examines the emergence of complex onsets in Brazilian Portuguese (BP). As with other languages, complex onsets in BP appear at a later stage in language acquisition. A very common strategy used by children when acquiring complex onsets is to present a single consonant. Thus, a word such as [pr]ato is typically transcribed as [p]ato for ‘prato’ plate for children who have not yet acquired complex onsets (Miranda 2003). In this paper we suggest that phonetic transcripts do not capture the rich and detailed content observed in languages and in child language acquisition in particular (Port 2007). We will show that children make use of vowel duration to express the covert contrast between single and complex onsets (Scobie et al 2000, Munson et al 2010). Contrast may be thus understood as a general property that serves to organize categories. Categorization, as a domain-general cognitive process, is the key to building representations. We argue that fine phonetic detail plays an important role in the emergence of complex onsets for BP children and must be considered as part of mental representation (Bybee 2001, Foulkes and Dochert 2006). We will then address the question as to whether recategorization, and the consequent reshaping of representations, may occur. Results from first language acquisition and speech therapy will support this view. We will then consider an ongoing case of sound variation in BP which involves complex onsets: li[vr]o ~ li[v]o book. It will be shown that patterns of usage observed in the community are also attested in child language acquisition. We suggest that language experience has an impact on mental representations. Categorization, as a domain-general cognitive process, is an important key to building representations.

On the domain specificity of the human language faculty and the effects of principles of efficient computation: contrasting language and mathematics

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The growth of language in the individual is determined by genetics, experience and principles of computational efficiency. The latter are taken to be part of natural laws affecting the development of biological systems. I discuss the effect of two principles of efficient computation applying to the derivation of linguistic expressions and their interface representations. I develop the hypothesis that these principles contribute to language variation and acquisition, given the domain specific properties of the human language faculty. In this perspective, I contrast language and mathematics.

I focus on Indirect Recursion (IR), the recursive merger of a given projection X mediated by a functional element F: [X [F X]]. I posit that IR is forced by the principle of efficient computation *Minimize Symmetrical Relations* (MSR), whereas it is not necessarily legible at the sensori-motor (SM) interface as enforced by the principle of *Minimize Externalization* (ME).

I discuss the results of neuro and psycholinguistic studies on the processing of complex nominals in Romance language and in English, which bring experimental support to my hypothesis. In conjunction, these principles provide an account for the variation and the apparent gradual development of functional categories in the individual. Furthermore, I provide evidence that IR, enforced by MSR and ME, hold for complex numerals, according to language specific parameters, differentiating Russian from Arabic, for example. I discuss recent contributions of neuroscience in the identification of species-specific brain pathways for language and mathematical computations. IR is generated by the computational procedure of the human language faculty, while concatenation is available for mathematical operations, in humans and animals. MSR and ME affect the computations in the dedicated regions of the human brain activated in language, predominantly BA 44-45; whereas such principles do not affect the processing of mathematical formulae, which strongly recruits a more anteriority located region, predominantly BA 47.

Theoretical and experimental results indicate that the MSR and ME principles affect the computation of complex nominals and complex numerals by the human brain; whereas there is no evidence that this would be the case for mathematical formulae.

Synergies in early language acquisition

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For a long time, children were thought to acquire first the sounds of their native language (its phonology), then its words (or lexicon), then the way in which words are organized into sentences (its syntax). This corresponds to what young children produce: first they babble (between 6 and 12 months), then they speak in isolated words (1-2 years), and then they start combining words together. Accordingly, researchers have looked for ways in which children may acquire the sound system of their language before they know words, words before they know syntax, and so on. In many cases however, computational studies have shown that some learning problems are intractable unless one postulates access to at least partial information from other domains, and experimental studies have shown that children have managed to learn some of this partial information. I will present experimental and computational work that tackle acquisition problems where synergies between domains have been demonstrated (between phonology and lexicon, and between lexicon and syntax).

Reverse engineering early language learning: data and models

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Decades of research on early language acquisition have documented how infants quickly and robustly acquire their native tongue(s) across large variations in their input and environment. The mechanism that enable such a feat remain, however, poorly understood. The proposition, here, is to supplement experimental investigations by a quantitative approach based on tools from machine learning and language technologies, applied to corpora of infant directed input. I illustrate the power of this approach through a reanalysis of some previous claims made regarding the nature and function of Infant Directed as opposed to Adult Directed Speech (IDS vs ADS). I also revisit current ideas about the learning of phoneme categories, a problem that has been long thought to involve only bottom-up statistical learning. In contrast, I show that a bottom up strategy does not scale up to real speech input, and that phoneme learning requires not only the joint learning of phoneme and word forms but also of prosodic and semantic representations. I discuss a global learning architecture where provisional linguistic representations are gradually learned in parallel, and present some predictions for language learning in infants.

THE COST OF PROCESSING VOWEL DIACRITICS IN ARABIC: EVIDENCE FROM MASKED-PRIMING.

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In the Arabic writing system, the written form of a word contains letters representing only consonants. Long vowels are rendered by the letters which represent the glides [y] and [w] and the glottal stop (<y> = [ii], <w> = [uu] and <ʔ> [aa]). Short vowels are indicated by diacritics above (<◌َ> [a] and <◌ُ> [u]) and beneath (<◌ِ> [i]) individual consonant letters. However, these diacritics are not generally used in Arabic texts except in instruction materials for young children or second-language learners, or when required for disambiguation purposes. This raises questions about the long-term representation of visual word forms for proficient Arabic readers: Do they include information about short vowels or are they represented without any such information?

Extant research on this question has yielded conflicting results: Some studies show increased accuracy for reading vowelized word forms (Abu-Rabia, 1998, 2001) while others report the opposite (Ibrahim, 2013). Interestingly, vowelized word forms tend to be recognized more slowly than their unvowelized counterparts (Ibrahim, 2013; Bourisly et al. 2013). In the present study we attempt to bring clarity to this conflicting picture concerning the effect of diacritic vowels in Arabic by capitalizing on the visual masked priming paradigm. The stimuli consisted of 120 words (60 verbs and 60 nouns) that did not contain any of the three long vowels and were ambiguous when presented in their usual unvowelized form, and 120 pseudowords matched for the word template. Vowelization was varied on the prime (P) and target (T), producing four conditions: (i) vowelized P - vowelized T, (ii) vowelized P - unvowelized T, (iii) unvowelized P - vowelized T, and (iv) unvowelized P - unvowelized T. If Arabic visual word forms are stored with their short vowel information, then the presence of vowel diacritics in the prime should speed recognition of the target, regardless of its condition, because a disambiguated lexical entry should be more easily accessible in these cases. Unvowelized primes, on the other hand, should only produce facilitation for unvowelized targets, due to full form repetition. If, however, Arabic visual word forms are stored without any vowel information, then no interaction between Prime Type and Target Type would be expected.

Data from forty-nine Arabic speakers revealed an expected lexicality effect (words were recognized significantly faster than pseudowords) and that vowelization induced longer reaction times across the board: vowelized targets took longer to be responded to than unvowelized targets, as did targets preceded by vowelized compared to unvowelized primes. Crucially, the interaction between Prime and Target Types was not significant. This finding is consistent with Ibrahim's (2013) and Bourisly et al.'s (2013) results, but not Abu-Rabia's (1998, 2001). Interestingly, the combination of vowelized primes with vowelized targets were the conditions eliciting the slowest reaction times, even though a full form repetition occurred in those cases.

These results suggest that diacritics, even though they reduce the lexical ambiguity of visual word forms, do not produce the most facilitation in reading of isolated words, indicating that, even for skilled readers of Arabic, diacritics are costly to process. A possible mechanism to account for this could be that the low visual familiarity (vowelized forms are infrequently encountered) triggers the engagement of a slower process of letter-to-sound mapping, instead of automatic retrieval. This would then suggest that ambiguous (or homographic) unvowelized forms may not be ambiguous for Arabic readers or may have a default/most frequent interpretation.

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INFANT-DIRECTED SPEECH: TAILOR-MADE FOR LEARNING?

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Infants' language acquisition can be described as the result of the interplay between the characteristics of the input provided to the child, and the cognitive biases that inform the learning procedure the child brings to the task. In other words, it is widely believed that the richer the input, the simpler the task required of the infant learner. In this scenario, an appropriate description of the input is absolutely mandatory, as it can help us decide whether certain theories of infant cognition are implausible because they are doomed to failure when given realistic input.

It is likely that all children are exposed to two types of speech: infant-directed speech (IDS) and adult-directed speech (ADS). The two types are not equivalent, since laboratory studies show that children attend more to the former, and they might even learn better from it. Moreover, corpora descriptions suggest that certain features of IDS (i.e., the ways in which IDS and ADS differ) may be cross-culturally widespread, or even universal. If children attend more to IDS and learn better from it, and parents of many cultures modify their speech in similar ways when addressing their child, might it follow that *IDS is actually tailored by caregivers specifically to promote language acquisition?*

This fascinating question has garnered much interest, and an equal amount of controversy, over the last 50 years. Empirical answers have attempted to (a) describe differences between IDS and ADS, and (b) tie these differences to learning outcomes in actual or modeled children. This war has been fought on several terrains, with most research in the 1970s-1990s focusing on syntax, morphology, and semantic development. The last 20 years have seen a strong resurgence of interest on the proposal that IDS characteristics are selected for learnability considerations specifically in the field of phonology, and to a lesser extent protolexical development.

This emergent literature is relevant to a broad range of researchers working on language acquisition for three reasons. First, an interest in how children move from the surface acoustics to abstract phonological units forces us to ponder what learnability actually means: What are the objects of learning, what are the goals of learning, and what is "easier" in this context? Second, it quickly becomes evident that theoretical responses to the three "what" questions have crucial effects on how empirical proofs are sought, and in their stead, on the validity of answers that are found. Finally, the empirical results themselves reveal a complex panorama, strongly suggesting that the learning task is not solved *by the caregiver for the child at all linguistic levels at once*. In other words, evidence both for and against a tailor-made view of IDS can be found, depending on whether one looks at one level or another.

In sum, this review illustrates the usefulness of looking at real input to think about plausible theories of language acquisition, and strongly suggests that the only way out of a theoretical deadlock involves adopting a holistic, multi-level approach to infant language acquisition.

Keywords: Infant-directed speech; Motherese; Parentese; Baby talk; learnability; phonology; phonetics; lexicon;

Bimodal Bilingual Development: Focusing in Code-Blending Production

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Children who are exposed to a spoken language and a signed language can become bimodal bilinguals. Like adult bimodal bilinguals (Emmorey et al. 2008), children produce a variety of structures reflecting one or the other language, and most interestingly, structures reflecting the influence of both languages. The latter include cases of cross-linguistic influence (code-mixing), code-switching, and code-blending. Code-blending is a unique reflex of the bimodal bilingual's option to produce (portions of) a linguistic message using both modalities simultaneously.

In this presentation, we focus on instances of code-blending in the spontaneous production of bimodal bilinguals (hearing children with Deaf parents) from two language pairs: English + American Sign Language (ASL), and Brazilian Portuguese + Brazilian Sign Language (Libras). We will report on data from children ages 1;04-3;09, and their adult interlocutors.

Our model considers code-blending to be one possible outcome from a derivation that freely makes use of linguistic elements from both languages. The derivation is constrained by the need for selected elements to be appropriately licensed. Each utterance produced, whether unimodal or bimodal, reflects the derivation of one proposition.

To explore our hypothesis that blending utterances reflect the output of a single computation, we analyzed the amount of overlap between the speech and the sign. We conclude that children are different from adults in that they are still developing coordination, but otherwise they make full use of the possibilities made available in bimodal bilingualism. In particular, they may combine aspects of both languages as the output of a single computation.

The beginning of morpho-syntactic acquisition in infants

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How do infants bootstrap initial morpho-syntactic learning? One idea is that this can be achieved by using functional morphemes and prosody. I will review empirical findings that demonstrate that infants begin to perceive and represent functional morphemes from the first year of life. I will present our recent experiments on preverbal and early verbal infants' learning of bound functional morphemes and morphological alternations. I will also present our experiments on infants' use of function words and prosody for acquiring basic grammatical categories and features.

Two-Year-Olds correctly adjust their syntactic interpretations following the information provided by different syntactic contexts

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To understand sentences, adults integrate their prior expectations about likely utterances (world-knowledge, linguistic regularities (Trueswell & Kim, 1998) with the information they extract from the input (auditory, visual (Tanenhaus, Spivey, Eberhard, & Sedivy, 1995)). Depending on the level of uncertainty of a given environment (noise, accents, new talker), adults adjust their prior linguistic expectations to weigh the plausibility of different information sources (Gibson, Bergen, & Piantadosi, 2013). Here we test whether toddlers learning their language engage in a similar process while interpreting novel verbs.

Concretely, we rely on the work of Dautriche et al., (2014) who showed that French 2-year-olds incorrectly expect novel verbs embedded in right-dislocated sentences (e.g. *,il_i VERB, le bébé_i* ‘he_i is VERBing, the baby_i’ meaning ‘the baby is VERBing’) to map to a causal action (someone else is VERBing the baby), even though the post-verbal intonational phrase boundary should block this interpretation. Importantly, toddlers correctly interpret right-dislocated sentences with familiar verbs (*it_i eats, the rabbit_i*). Thus, their failure to integrate prosodic cues when interpreting novel verbs is not a failure to use prosody *per se* but a reflection of their prior syntactic expectations. Indeed, several studies (e.g., Yuan & Fisher, 2009) suggest that toddlers’ initial representation of sentences is driven by the set of noun phrases (NPs): each NP gets a participant role. By default, any novel verb appearing in a NP-verb-NP sentence would thus refer to a causal action where an agent (the first NP) acts on a patient (the second NP).

We hypothesize that enriching the learning context of the novel verb may help toddlers to depart from their default interpretation. More specifically, the *set* of syntactic frames in which a verb appears, rather than a single frame, may help toddlers to infer its meaning (Scott & Fisher, 2012). For example hearing “She_i *blicks*, the baby_j! Oh, she *blicked!*” may increase the probability of *blick* being considered intransitive, and hence refer to a non-causal action (since *blick* also appeared in an intransitive sentence).

Following the preferential looking paradigm of Yuan & Fisher (2009), we presented 28-month-olds (n=80) with dialogues introducing a novel verb (*'daser'*) in one of four conditions (20 babies in each condition): transitive-intransitive sentences, dislocated-intransitive sentences, dislocated sentences only and intransitive sentences only. After being exposed to the dialogue phase, toddlers were then asked to look for *'daser'* while viewing two videos displayed side-by-side in a TV screen: a causal action featuring two participants, and a one-participant action.

As expected, children in the dislocated only condition associated the novel verb to the causal action, and so did children in the transitive-intransitive condition. Indeed, many verbs relating two participants (e.g., *eat*) can enter an alternating pattern between transitive and intransitive sentences in which the object is sometimes dropped. Crucially, in the dislocated-intransitive condition, children behaved as in the intransitive only condition: they did not show any preference for the causal action. Thus, the presence of intransitive sentences in the dialogue increased the plausibility of the non-causal interpretation, only when combined with dislocated sentences. We conclude that toddlers can adjust their prior syntactic expectations when given more information in the input, and flexibly revise a default interpretation.

Key-words: syntax; language acquisition ; prosody ; online sentence processing; rational inference

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THE ROLE OF LEXICAL PROPERTIES AND REFERENTIAL CONTEXTS IN THE PROCESSING OF SYNTACTIC AMBIGUITIES BY CHILDREN AND ADULTS

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A mainstream of psycholinguistics takes language as an autonomous, encapsulated module (Fodor, 1983), immune to other systems such as the visual or perceptual ones. From this point of view, the parser uses a portion of its grammar knowledge isolated from world knowledge and other information for the initial identification of syntagmatic relations. Tanenhaus et al. (1995), among many others, point out that adults, when presented to biased visual contexts, use extralinguistic information in order to process syntactic ambiguities, showing that they are sensitive to the Principle of Referential Support (Altmann & Steedman, 1988; Crain & Steedman, 1985). When five-year-old children undergo similar tests (Trueswell et al., 1999), however, they rely on syntactically based parsing principles or on the lexical properties of the input and ignore referential information. Here, we tested the effect of visual context and lexical bias during the processing of ambiguities. 36 children and 31 adults were asked to manipulate toys in response to globally ambiguous verbal instructions like "clean the zebra with the brush", in which the prepositional phrase can be interpreted as an instrument of the action (VP-attachment) or modifier of the object (NP-attachment). We used the technique of the Visual World Paradigm (Trueswell, 2008) in which eye-gazes and gestures are monitored in order to obtain measures of the final processing of the sentences and measures of the real-time processing. The disambiguation can be influenced by two factors: (a) the lexical bias of the verbs contained in the instructions – structural information; low-level evidence –, or (b) visual context – reference information; high-level evidence –, which is manipulated through different arrangements of objects in a platform. We obtained measures of the final processing of the sentences (participant's gestures in response to the instruction) and measures of the real-time processing (tracking of participant's eye movements). Our goal was to verify whether non-linguistic information is able to interfere with syntactic processing and, if so, whether they are processed equally in all stages of language development. Our results reveal that high-level global cues (reference bias) influence real-time processing equally in adults and children, while low-level local cues (lexical bias) interfere with biased stimuli. In the presence of neutral lexical properties, adults perform actions that correspond to NP-attachment only in competitive referential contexts and children prefer VP-attachment interpretation in all cases. We concluded that the lexical neutrality allows for the manifestation of the Principle of Referential Support in adults; children, on the other hand, manifest a certain effect (still to be defined) in which VP-attachment structures are preferred. These findings ensure the Continuity Assumption according to which children and adults access the same cognitive mechanisms in processing language in all phases of development (Crain 1991; 2002; Crain and Wexler 2000; Meroni & Crain, 2003; Pinker, 1984). The results also align with the lexicalist theories such as the Constraint-Satisfaction (MacDonald, Pearlmutter & Seidenberg, 1994; MacDonald & Seidenberg, 2006; Trueswell & Tanenhaus, 1994), in which multiple information compete for generating a single interpretation. This theory predicts that, during the development of the parser, structural information such as verbs bias emerge earlier and more robustly than less reliable ones such as the discourse-pragmatic cues.

Keywords: language development; online processing; offline processing; syntactic ambiguity; referentiality.

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THE TIME COURSE OF MESSAGE GENERATION AND LINGUISTIC ENCODING: EXPLORING THE LANGUAGE-VISION INTERFACE

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The time course of message generation and of linguistic encoding is a topic of debate in psycholinguistic research (Bock et al., 2004; Konopka & Brown-Schmidt, 2014). There are two main positions concerning message planning from visual inputs: the “wholistic” view, according to which the process of linguistic formulation of a sentence starts only after a rudimentary message has been planned (Griffin & Bock, 2000), and the incremental view, which assumes that linguistic formulation begins as soon as the visual input becomes available (Gleitman et al., 2007).

In this work we explore, experimentally, the communication between the visual and the linguistic domains in order to investigate the starting point of sentence formulation in language production. We report two eye tracking experiments with a scene description task conducted with thirty-six Brazilian Portuguese speakers. The images depicted two human characters engaged in an activity that could be described using transitive verbs either in the active or in the passive form.

In **Experiment 1**, speakers described scenes concomitantly with the presentation of the visual input. In **Experiment 2**, subjects realized the same task, but they had their attentional focus drawn to a particular character (either the agent, in one condition, or the patient, in the other condition) by way of an attention-capture resource similar to the one used by Gleitman et al. (2007).

The results of the first experiment revealed a clear preference for active structures. No relationship between first fixated character and syntactic structure chosen (active/passive) was observed. The onset of the verbal response occurred, on average, 1.7 s after the presentation of the visual stimuli, approximately the same amount of time that a control group took to identify the patient of the event depicted in the scenes, in a silent *patient-detection* task. In the second experiment, the same verbal and eye-tracking patterns were obtained. It was observed, however, a marginal decrease in the number of active sentences ($p < .06$) and a significant increase in the number of passive sentences ($p < .02$) when the patient favoring condition was compared to the agent favoring condition.

Taken together these findings are consistent with the hypothesis that the generation of a message precedes formulation. The absence of correlation between first fixations and type of structure chosen seems to suggest, as did previous findings (Griffin & Bock, 2000), that before committing to a starting point speakers generate a rudimentary message to express the propositional content apprehended from the scene. Attention-capture resources as the one used in the second experiment can act favoring a particular interpretation of the scene. As a consequence, the favored interpretation of the scene may be occasionally reflected in the linguistic structure, but, as observed, with no strict relation between initial fixation and chosen subject. Instead, in the circumstances of this experiment, the sentence formulation process seemed to be guided by cost related issues, since active structures were preferred in both conditions. In order to further investigate the time course of message plan and sentence generation, a third experiment is currently being conducted. Scenes are incrementally shown in a scene description task. Subjects are instructed to start the description as soon as one of the characters is presented. The idea is to force the formulation of a sentence concomitantly with the visual apprehension of a scene in order to verify whether the production situation can influence the amount of information necessary to start the linguistic encoding of the sentence.

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Keywords: language production; message encoding; sentence generation; eyetracking; language and vision interface

The evolution of the faculty of language

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The evolution of the faculty of language largely remains an enigma. In this course, we ask why. Language's evolutionary analysis is complicated because it has no equivalent in any nonhuman species. There is also no consensus regarding the essential nature of the language “phenotype.” According to the “Strong Minimalist Thesis,” the key distinguishing feature of language (and what evolutionary theory must explain) is hierarchical syntactic structure. The faculty of language is likely to have emerged quite recently in evolutionary terms, some 70,000–100,000 years ago, and does not seem to have undergone modification since then, though individual languages do of course change over time, operating within this basic framework. The recent emergence of language and its stability are both consistent with the Strong Minimalist Thesis, which has at its core a single repeatable operation that takes exactly two syntactic elements a and b and assembles them to form the set $\{a, b\}$.

The study of learning mechanisms in the brain

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From the traditional perspective of associative learning theory, the hypothesis linking modifications of synaptic transmission to learning and memory is plausible. It is less so from an information-processing perspective, in which learning is mediated by computations that make implicit commitments to physical and mathematical principles governing the domains where domain-specific cognitive mechanisms operate. We compare the properties of associative learning and memory to the properties of long-term potentiation, concluding that the properties of the latter do not explain the fundamental properties of the former. In this course I will briefly review the neuroscience of reinforcement learning, emphasizing the representational implications of the neuroscientific findings. I will then review more extensively findings that confirm the existence of complex computations in three information-processing domains: probabilistic inference, the representation of uncertainty, and the representation of space. I argue for a change in the conceptual framework within which neuroscientists approach the study of learning mechanisms in the brain.

How does immature brain learn?: The case of healthy preterm

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During the first year of life full-term infants rapidly learn specific properties of their native language. It is accepted that this learning emerges as a consequence of the interaction between the advances in neural maturation and the systematic experience with a natural language.

In a series of studies we have explored the role of the two components of this interaction, i.e. neural maturation and speech experience, in early language acquisition, by comparing the time course of native language learning in healthy full-term and highly premature infants. Premature infants confront external widespread sensorial stimulation, including speech, with an immature neural system. What do they gain from this stimulation? Our studies explored this question.

In our study all premature infants were born about three months before the expected age, having an auditory system functionally sensitive to speech stimulation. We compared the development of full- and preterm infants in two linguistic and one social tasks. Linguistic tasks were language discrimination upon the basis of their rhythm and native phonetic repertoire construction; and the social task was gaze following. It is accepted that the three tasks are respectively developed near 5, 12 and 7 months age in full-term infants. All tasks were evaluated at the age when full-term infants have demonstrated learning as well as about three months before this age. Since preterm were exposed to speech about three months before, we focused our comparisons on the results observed in full- and preterm infants matched by either their chronologic or corrected age. Chronologic age corresponds to the age after birth whereas corrected age indicates the age after the date when infants should be born. Our main hypotheses were, if speech exposure triggers and accelerates native language learning, the time course of the language learning in preterm infants will be similar to that observed in full-term when infants are matched by their chronological age. Alternatively, if neural maturation controls native language learning, language acquisition in preterm infants will progress with a similar time course pattern to that observed in full-term infants matched by their corrected age.

Language studies measured infant response by using EEG recordings while social task was evaluated by using eye tracking technique. Our results showed that linguistic tasks are mainly influenced by neural maturation as compared to the amount of exposure to broadcast speech. In contrast, social task is influenced by experience. In fact, preterm infants do not accelerate linguistic tasks but they do it in gaze following.

In global, our results suggest that neural maturation constraint at least some early language acquisition abilities but not social cognition estimated by gaze following. We discussed the role of brain maturation and experience during early learning.

BARE SINGULAR MASS NOUNS CAN BE INTERPRETED AS COUNT NOUNS

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The basic denotation of bare singulars (BS) in Brazilian Portuguese (BP) as in ‘Eu comprei livro’ (I bought book) has been the topic of much debate in formal semantics. Some authors (cf. Munn & Schmitt 2005, Schmitt & Munn 1999, Müller 2002 and Paraguassu-Martins & Müller 2007, Dobrovie-Sorin & Pires de Oliveira 2008) argue that BSs in BP are number neutral count nouns and cannot be analyzed as mass nouns. Others (Pires de Oliveira & Rothstein 2011) argue that BSs in BP have mass denotations. We explore experimentally two possible predictions of Pires de Oliveira & Rothstein’s (2011) proposal. First, that BS count nouns can be interpreted as referring to Volume (mass interpretation) and Number (count interpretation). Second, that BS mass nouns could be interpreted as referring to Number (just like BS count nouns). Two offline tasks were used in order to test those predictions: a truth value judgment task and a quantity judgment task. **Truth value judgment task** (Crain & Thornton 1998) this task was used to evaluate: 1) whether utterances that included BS mass nouns (*água* ‘water’) can be felicitously interpreted as count nouns (Number (1b), not Volume (1a)); whether utterances that include BS count nouns (*bola* ‘ball’) and aggregates (*família* ‘family’) can be felicitously interpreted as mass nouns (Volume, not Number). 22 adults were exposed to 8 items (2 BS count nouns, 2 BS mass nouns, 2 BS aggregate nouns) randomized in two different lists:

(1a)



(1b)



‘Tem muita água no chão’

(There is *muita** water on the floor)

**muita* = ambiguous quantifier (a lot/many)

Results in the ‘Volume scenario’ (2a), participants accepted the description with a BS mass nouns in all trials (100%). For count and aggregate nouns, 73% of the answers indicated that count nouns can be interpreted as referring to Volume and only 9% of the answers suggested the same pattern for aggregates. In the ‘Number scenario’, participants accepted the description with a BS count noun (95%) and BS aggregate noun (90%). For BS mass nouns, we observed 73% of acceptance, which indicates that mass nouns can be interpreted as referring to the number of individuals (count). This suggests that BS mass nouns and BS count nouns can both be interpreted as Number and Volume. **Quantity judgment studies** (Barner and Snedeker (2005) and Bale and Barner (2009)) while presenting two different photos, one with two big portions of *x* (Volume) and another with six different portions of *x* (Number), we asked whether a person had more *x* than another. Subjects answered 3 questions with a BS mass noun, 3 questions with a BS count noun, and 3 questions with a BS aggregate noun. **Results** participants consistently chose the ‘Number’ photo for BS count (99%) and BS aggregate (97%) nouns; BS mass nouns are rarely associated with the ‘Number’ answer (21%). Thus, the default interpretation for BS mass nouns in neutral contexts is a ‘Volume’ interpretation and a ‘Number’ interpretation is the default interpretation for BS count and BS aggregate nouns. **Discussion:** supporting Pires de Oliveira & Rothstein (2011) BS nouns - count or mass - in BP can be interpreted as both Number and Volume as long as the context supports these interpretations. In neutral contexts, a count interpretation prevails for BS count and BS aggregate nouns and a mass interpretation prevails for BS mass nouns as also showed by Bevilacqua (2014) and Lima (2014, in press).

Keywords: experimental semantics; count/mass distinction; bare singulars; Brazilian Portuguese.

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THE PROCESSING OF SUBJECTS IN CLAUSES WITH UNACCUSATIVE VERBS IN BRAZILIAN PORTUGUESE

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This paper reports a study about an apparent case of optionality in Brazilian Portuguese syntax. Such optionality affects the placement of syntactic subjects of monoargumental unaccusative verbs. In Brazilian Portuguese these verbs allow for either pre-verbal or post-verbal subjects, as attested by the two examples below, for which there does not seem to be clearly syntactic, semantic or pragmatic motivations for selection of either the pre-verbal or post-verbal position of subjects of the unaccusative verb instantiated in both sentences:

- (1) Enquanto Pedro e João falavam ao povo, chegaram os sacerdotes...
While Peter and John talked to the people, arrived the priests...
While Peter and John talked to the people, the priests arrived...
- (2) Ele estava sozinho no local quando os policiais chegaram.
He was alone at the spot when the policemen arrived.

Sorace (2005) proposes a distinction between “hard” and “soft” syntactic constraints, arguing that the former lead to categorical linguistic judgments, whereas the latter lead to gradient judgments. Therefore, soft syntactic constraints are the locus of optionality in grammars. The author suggests that hard constraints reflect strictly structural properties of language, and soft constraints may be regarded as resulting from interface configurations or interactions between the grammar and processing mechanisms and restrictions.

In this study, we explored whether there are differences in processing cost for each of the two subject positions that could indicate a preference for one of them. In light of the view that Brazilian Portuguese is gradually acquiring characteristics of a non-pro-drop language (Kato & Duarte, 2014), we hypothesized that pre-verbal subjects would be preferred. Our investigation was based on an experiment for which we employed a type of self-paced reading task that allows for very precise localization of processing events that trigger higher costs: the maze task (Foster, Guerrera & Elliot, 2009). In the maze task, participants are required to decide between two lexical items as they move along screens to read sentences on a word-by-word basis. Our materials contained manipulations of both subject position and of animacy of subject referents.

Contrary to our initial expectation, our results provide evidence that post-verbal syntactic subjects in sentences with unaccusative verbs systematically yield less processing cost for speakers of Brazilian Portuguese. We further observed that animate subjects systematically yield less processing cost, irrespective of position. We interpret such results as indicating that the preferred position for subjects of unaccusative verbs in Brazilian Portuguese may be a case of a soft constraint currently in operation for subject placement in this language, and we argue that the underlying mechanism may be supported by an interaction of processing efficiency and early integration of semantic information.

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SENTENTIAL NOMINALIZATION AND RECURSION IN PIRAHÃ

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I. Everett (2005, 2009) claims that Pirahã, a language spoken in the Amazon region of Brazil, is non-recursive. With respect to the availability of recursion within the nominal domain, Everett claims that only one level of embedding is possible within possessive noun phrases:

- (1) xipoógi hoáoíi hi xaagá (2) [kó'ói hoagí] kai gáihíi 'íga
xipoógi shotgun 3Psg be *Ko'ói son daughter that true*
This is Xipoógi shotgun 'That is Kó'ói's son's daughter'

II. In this presentation, we will present new data showing that multiple levels of recursion is indeed available within possessive noun phrases in Pirahã. As (3) and (4) show recursive possessors are possible.

- (3) agoa Iapohen motohoi (4) niupai hi igato huakue kopae
canoe Iapohen motor *dog 3PSg tail long back*
'Iapohen's canoe's motor' 'The long tail of my black dog'

Interestingly, however, it interacts with word order. In (4) and (5), the order Possessor>Noun is inverted in the second level of embedding, as the possessor appears post-nominally. We argue that this is to be related to the semantic distinction between inalienable and alienable possessive relations. In (3)-(4), the semantic relation between the possessor and the noun is inalienable in the level of embedded (*motor boat, dog tail*), but alienable in the second level (*canoe Iapohen, dog my*).

III. Everett also presents the so-called *gai-sai* constructions (5) as evidence for the lack of recursion within the sentential domain.

- (5) Maria hi gaisai massi ti
Maria 3Psg say-NOMINALIZER beautiful I
'Maria said I am beautiful'

According to Everett's analysis, *-sai* is a nominalizer morpheme. Hence, in (5) the matrix verb is nominalized in order to avoid a recursive structure in which one sentence is embedded inside the other. Assuming *-sai* to be a nominalizer, as it functions as a nominalizer elsewhere (6), we suggest that (5) is another instance of possessive noun phrases. Hence, (5) means (7). This is the only syntactic context in which the pronoun *hi* appear. This pronoun is also available in possessive constructions, as shown in (1). As we will also show these constructions present the same order restrictions notice above for possessive nouns phrases. Hence, these are cases in which a verb is nominalized and the whole construction is understood as a possessive noun phrase, which, as we will show, contains and embedded sentence as the complement of the verb. In Pirahã there is overt copular verb 'to be', but as we will suggest, (5)-(7) might involve a covert one.

- (6) xiohói xiboít-i-sai
wind cutter-NOMINALIZER
'Propeller'
(7) Maria's saying was I am beautiful

Keywords: nominalization; Pirahã; recursion; possessive constructions

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Domain Specificity: Early and Later Learning

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Whenever the mind applies existing structures, it is always easier to learn more about those content that these structures support. Some early learning content areas benefit from the presence of organized skeletal principles, even if they are nascent. They actively engage the environment for data sets that share examples of a given structure. For example, non-verbal counting principles and arithmetic share a structure with the use rules of counting and the resulting cardinal value. A different skeletal domain attends to and assimilates the difference between animate and inanimate items, and so on. In my talk, I also will consider why the possibility that existing domain-specific knowledge can interfere with later learning in what seems to be the same domain. I review the evidence that there is a pre-linguistic number module that generates representations of numerosity and plays a critical role in the development of the child's understanding of verbally mediated counting and numerical reasoning. The big issue is whether we can say that these accomplishments support the learning with understanding of the language of mathematics.

The Filled Gap Effect in Brazilian Portuguese in Selective fallibility and Grammatical Illusion contexts: eye-tracking and self-paced reading evidence

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The Filled Gap Effect (cf. Stowe, 1986) is investigated in Brazilian Portuguese through eye-tracking and self-paced reading experiments. Results detect the presence of FGE, suggesting that the parser is strictly syntactic in the early stage of processing. The final measures in the two experiments present discrepant results, motivating a discussion on possible good-enough effects.

In another SPR study, the filled gap effect is taken as baseline to study the behavior of the parser in the processing of nonfilled gaps and nonexistent gaps. Results indicate the rapid structural action of the parser and its fallibility in the processing of names in the function of adjuncts but not in the processing of adverbs. A similar effect is not instantiated in constructions with intransitive verbs, suggesting a sensitivity of the parser to subcategorization information. Off-line results motivate a discussion of good-enough effects.

A third SPR study presents results in which WH-constructions display active filler and active gap effects to substantiate a discussion about the interdisciplinary interaction among the fields of Theory of Grammar, Experimental Syntax and Sentence Processing. The results suggest that theta-role assignment to a target DP by a ditransitive verb is processed less eagerly than the search for theta-role receipt by the target DP, indicating an asymmetry which has not been originally predicted in the theta-criterion bi-univocal formulation (cf. Chomsky, 1981).

Domain General and Domain Specific Mechanisms in Real-time Grammatical Computation

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Linguists are impressed by the rich grammatical details that natural languages follow. There is now abundant evidence that speakers and comprehenders show fine-grained control over these details during moment-by-moment speaking and understanding, but how do they do this? To make matters more interesting, much recent research provides compelling evidence that language users make use of domain-general memory access mechanisms to retrieve words and phrases and to form linguistic dependencies during comprehension. But these domain-general mechanisms, which access information based primarily on content, are not straightforwardly compatible with pervasive constraints that focus primarily on structural configurations. I will discuss the memory mechanisms, the linguistic constraints, the current evidence on how to reconcile them, and key questions for future research.

Is it possible to bridge the gap between linguistic theory and the psycholinguistic research on language processing and acquisition?

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A brief historical overview of the relationship between the research in Psycholinguistics and in Generative theory is provided. Domain specificity is considered as a major sticking point between these areas. It is argued that the minimalist program of generative linguistics makes it easier for these fields to be reconciled. In this context, domain specificity can be restricted to universal grammatical operations and to the grammatical information represented in the formal features of functional categories. A research program is presented, which is intended to provide an algorithmic model of the syntactic computation carried out in sentence production/comprehension, and a procedural theory of language acquisition grounded in the concepts of innately guided learning that guides psycholinguistic research of infants' language processing, and the generative principle of Full interpretation at the interfaces between language and processing systems.

**PRODUCING REGULAR AND IRREGULAR VERBS IN RUSSIAN:
A PPI ANALYSIS**

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The generation of regular and irregular past tense verbs has long been a testing ground for different models of inflection in the mental lexicon. According to the dual-route view, regular forms are generated by a rule and irregular forms are retrieved from memory. The single-route view postulates a single integrated system for all forms. Behavioral studies examined a variety of languages, but neuroimaging studies rely almost exclusively on English and German data. In our fMRI experiment, participants inflected Russian verbs and nouns of different types and corresponding nonce stimuli. Russian is a morphologically rich language with a very complex verb class system, where the notion of regularity is even hard to define (in this study, we took the most frequent out of five productive verb classes and verbs from several infrequent non-productive classes, which we further call 'regular' and 'irregular').

Subtractive analysis of the data reported in (self-identifying reference) showed that functional activity within the fronto-parietal network was greater for irregular verbs than for regular ones and for nonce verbs than for real ones. A similar pattern was found for nouns. We demonstrated that the effects of (ir)regularity and lexicality were very similar and concluded that they were induced not by these factors as such, but by the increase of processing load.

In this paper, we subjected our data to a ROI – whole brain voxel-wise analysis of context dependent changes in functional connectivity (PPI analysis). Subtractive analysis allows revealing functionally segregated brain areas that change their activity in response to experimental manipulations, while PPI is a measure of functional connectivity, which provides complementary information showing how these segregated brain areas are integrated. Firstly, we found that functional connectivity between the left inferior frontal gyrus (LIFG) and bilaterally distributed clusters in the superior temporal gyri was significantly greater in regular real verb trials than in irregular ones. No other comparisons gave significant results. Secondly, we observed a significant positive covariance between the number of mistakes in irregular real verb trials and the increase in functional connectivity between LIFG and the right anterior cingulate cortex in these trials as compared to regular ones. Thus, we could dissociate regularity and processing difficulty effects.

Only one previous PPI study of inflectional morphology was found (Stamatakis et al. 2005). In this study, functional connectivity between functionally predefined ROIs was assessed during the same/different judgment task. Stimuli were orally presented pairs of English words and nonce words, in particular, regular and irregular verb pairs like *jumped– jump* and *thought – think*. Thus, the method and materials were very different from ours. Our first finding is similar to what Stamatakis et al. reported, which shows that the observed regularity effect is very robust, being valid crosslinguistically both for production and comprehension.

As for the second finding, Stamatakis et al. have similar results going in the opposite direction. This is also true for the subtractive analysis of their data reported in (Tyler et al., 2005). We hypothesize that this is because the processing difficulty goes in the opposite directions in the two studies. Tyler et al. and Stamatakis et al. looked at stimulus pairs like *stayed – stay* vs. *taught – teach*. In the regular pairs, the first stimulus was morphologically complex and the second was not, while in irregular pairs, both stimuli were morphologically simple. Thus, regular verb trials induced more processing load. Due to the nature of Russian

language, in our study all verb stimuli the participants read or produced were morphologically complex: e.g. *nyr-ja-t'* 'to dive' – *nyr-ja-ju* (1 person singular present tense form participants were asked to generate, regular) and *mol-o-t'* 'to grind' – *mel-ju* (irregular). But irregular verbs involved various alternations in the stems etc., so irregular verb trials induced more processing load.

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Keywords: MRI; Russian; inflectional morphology; functional connectivity; psychophysiological interactions; fronto-temporal brain network; dual-route theories; single-route theories.

DISCOURSE-BASED EFFECTS IN COMPREHENSION: WHEN HEARERS EXPECT NEW INFORMATION

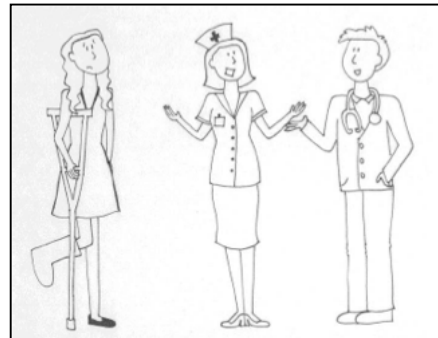
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The distribution of information in the discourse is affected by information status; for example, it has been shown that there is a strong tendency amongst many languages to place old information before new information in a sentence (see Arnold et al. 2013 for a review). In English, this ‘information shuffling’ can be achieved through the use of non-canonical syntax, such as passives and inversions. Our focus here is on English Existentials (e.g., *There’s a fly in my soup*). In this construction, the post-verbal noun after “There is” (e.g. ‘fly’) introduces information that the speaker believes to be *new* to the hearer (Prince, 1992). We investigated how quickly listeners use this kind of information during real-time language processing (see also Kaiser & Trueswell 2004 in Finnish). Can hearers anticipate that new information will be mentioned as soon as they encounter an existential, even before they have heard the noun?

Experiment: Thirty-three monolingual English speakers participated in a visual-world eye-tracking study. They heard sentences like ex.(1,2) while viewing images like the example shown.

(1) *A nurse was discussing new procedures with the doctor. There was a sad patient with a broken leg in the reception area, waiting for her turn.* [target]

(2) *A nurse was discussing new procedures with the doctor. That day a sad patient with a broken leg was in the reception area, waiting for her turn.* [control]



On targets, the first sentence introduced two out of the three pictured characters (e.g., nurse and doctor). This was followed by a second sentence, which was an Existential (ex.1) or a control sentence initiated by a temporal expression (ex.2). (Fillers involved images with differing numbers of characters, and not all of them were mentioned in the auditory stimuli.)

Predictions: If listeners are sensitive to the discourse properties of the existential construction, they should start to look at the new, unmentioned patient *even before hearing the noun ‘patient.’* In the control condition, no such anticipatory looks are expected.

Results. We analyzed the proportion of looks to the unmentioned entity during a 400ms time window starting at the onset of the existential (“There was...”). Crucially, this window ends *before* the onset of the NP. We find that during this time, participants are significantly more likely to look at the new character in the Existential than the Control condition ($p < 0.05$, see figure). Thus, even before hearing the noun, participants are able to predict that the upcoming noun will refer to a new, previously unmentioned entity.

As a whole, our results indicate that hearers expect new information to be mentioned immediately following an Existential construction, and can use this information rapidly during real-time language processing to guide their expectations about who will be mentioned next. This points to a rapid integration of syntactic and discourse/pragmatic information.

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SYNTAX FIRST MEANS CONTEXT COMES LATER: AN ERP STUDY OF THE TIME COURSE OF N400 EFFECTS

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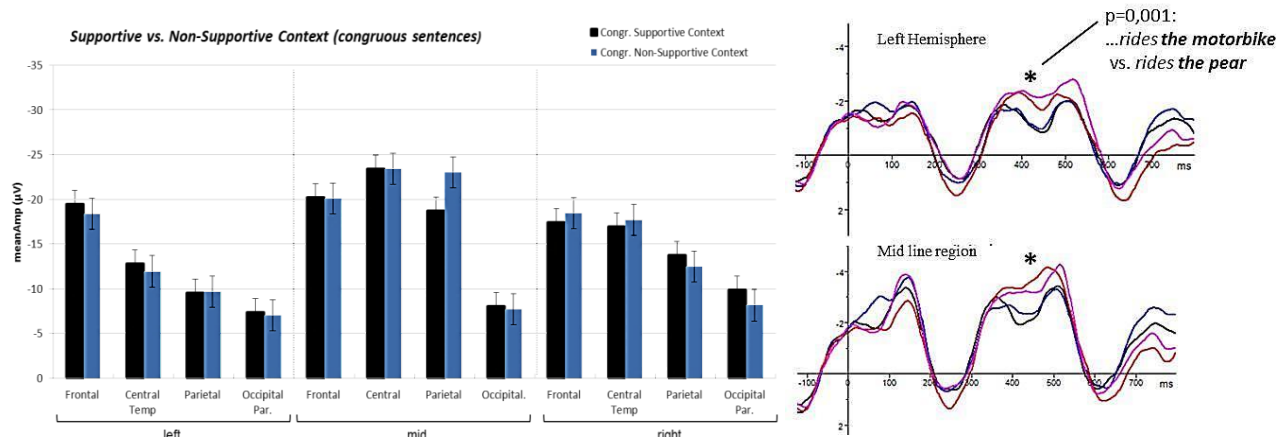
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In this study we address the time course of underlying cognitive functions of the Event Related Potential (ERP) component known as N400, a negative amplitude measured 400ms after target word presentation onset in sentence contexts. According to the N400 literature, this ERP signature may reflect difficult or facilitated integration of the target word into preceding context, given that semantically anomalous targets elicit higher N400 amplitudes (e.g. *cabin* in *John drank the cabin* (FRANÇA *et al*, 2004)), whereas contextually predictable targets (e.g. *palms* in *They wanted to make the hotel look more like a tropical resort. So along the driveway they planted rows of palms*) elicit comparably reduced amplitudes (FEDERMEIER & KUTAS, 1999; HAGOORT, 2004). Context modulated N400 effects may involve both discourse and world knowledge, which has led some authors to conclude that integration processes are the result of some kind of cognitive-general modal-free semantic processing (KUTAS, 2011). However, in these studies, crucially, presentation rates are slow (300ms per word, with a 100ms interval) compared to natural fast speech rates. This allows subjects ample time to incrementally process targets in a syntax first fashion and integrate it with world or conceptual knowledge later on. Seen in this light, the N400 effects in these studies, specifically, may reflect posterior post-syntactic processes. This is also confirmed by eye tracking studies, which show that discourse and world knowledge in garden path sentences only benefit ambiguity resolution in posterior reanalysis stages (RAYNOR, CARLSON & FRAZIER, 1983; RAYNOR, GARROD & PERFETTI, 1992).

Therefore, we argue that strictly linguistic combinatory processes, such as verb-complement merge, underlie early N400 effects. Using fast presentation rates (200ms per word, with a 100ms interval) that emulate natural processing speeds, we presented plausible and implausible target words in Brazilian Portuguese sentences in which all was maintained constant except for predictive and non-predictive contexts contained in preceding adjuncts, such as, respectively, *Even without a helmet* vs. *Every day, ...John rides **the motorbike** vs. **pear**.*

Indeed, our data show that at these rates, N400 effects are modulated by information present within the scope of the verb phrase only, but *not* by preceding predictive context. That is, we obtained a robust incongruence effect (...*rides **the motorbike** vs. **pear***), ($F(1,18)=17,157$, $p=0,001$) (see Graph 1), but *no* significance for context ($F(1,18)=0,419$, $p=0,526$) (see Figure 1).

Thus, we have been able to capture a subtle firsthand computation integrating the verb and its complement as the structural basis on which to subsequently pose accessory or contextual elements contained in an adjunct - even when placed prior to the verb in the surface sequence of the sentence.



Left: **Graph 1**: Mean amplitudes for 12 Regions of Interest (ROIs) for congruous sentences comparing predictive (in black) and non-predictive context (in blue) (e.g. *Even without a helmet vs. Every day, Jake drives↑ the motorcycle like a crazy man.*); Right: **Figure 1**: Averaged ERPs for ROIs for central and temporal electrodes comparing congruous sentences with predictive (in black, CSC) and non-predictive context (in blue, CNSC), and incongruous sentences with predictive (in red, ICSC) and non-predictive context (in pink, INSC).

Keywords: N400, syntax, ERP, context

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INDIVIDUATE, THEN MEASURE: ON THE ACQUISITION OF CONTAINER PHRASES IN ENGLISH

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Introduction: container phrases in constructions with numerals (as in ‘two glasses of water’) can be interpreted in at least two different ways (Selkirk 1977, Rothstein 2012, Partee and Borschev 2012). Firstly, a container noun can be used to denote actual containers filled with some substance; e.g. ‘glasses of water’ can denote actual glasses filled with some quantity of water (individuation). Secondly, a container noun can be used as the description of a unit of measurement; e.g. ‘glasses of water’ need not refer to actual glasses filled with water, but only to portions of water whose volume corresponds to the content of one glass (measurement). Partee and Borschev (2012) argue that when container nouns are used as measurement units they need to refer to identical and full containers. **Study:** in a felicity judgment task, we investigated whether 33 English speaking children (3 to 6 year olds) and 37 English speaking adults were aware of the distinction between individuation and measurement interpretations of container phrases in English. The participants saw a sequence of four short videos that bias the interpretation of a container phrase towards a measurement (e.g., Maria drank two cups of water) or an individuation interpretation (e.g., Mary put two bottles of milk on the table). Participants also saw a control video (substance or number mismatch). In the critical conditions, the four videos differed on whether the containers were full and identical or not (a-d).

a) Condition 1



b) Condition 2



c) Condition 3



d) Condition 4



Partee and Borschev (2012)’s analysis predicts that: 1) only conditions 1 and 2 were compatible with the measurement interpretation; 2) the individuation interpretation is compatible with all conditions. **Results (individuation):** in the adults’s group as well as for the children’s group (3 to 6 year olds) participants consistently accepted a description (Num + Container N + mass noun) 100% of time, for all conditions excepted in the control questions, independently of whether the containers were identical/full or not, as predicted. **Results (measurement):** adults accepted the description 100% of the time for condition 1, 27% of the time for condition 2, and 3% of the time for conditions 3 and 4 each. This suggests that they were sensitive to the different restrictions that individuation and measurement imposes. In the children’s group, 3 to 5 year olds did not differentiate the different conditions in measurement contexts (100% of acceptance for condition 1; 95% of acceptance for conditions 2, 3, and 4 each). That is, these children treat measurement and individuation contexts alike. However, 6 year olds distinguished measurement from individuation just like adults: 100% of acceptance for conditions 1 and 2 each; 23% of acceptance for conditions 3 and 4 each. **Discussion:** this study suggests a path in the acquisition of the interpretation of container phrases: when young children interpret phrases like “two bottles of milk” they first count the number of containers, ignoring the amounts of substance inside the containers, even in measurement scenarios. Only by 6 years of age children tease those two interpretations apart just like adults. These results support previous findings that show that children under 6 years of age present a low performance for tasks that involve the comprehension of measure words (liters, teaspoons, tablespoons (Levin & Wilkening 1989, Galperin & Georgiev 1969). Likewise, we have shown the same kind of difficulty for container nouns (that are not necessarily interpreted as measure units) by children at the same age.

Keywords: experimental semantics; container phrases; individuation; measurement.

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PROBABILISTIC FACTORS IN SPOKEN LANGUAGE PRODUCTION: A CORPUS STUDY OF RUSSIAN SPEECH ERRORS

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Phonological, semantic, and syntactic speech errors (commonly known as slips of the tongue) spontaneously produced by native Russian speakers were analyzed for probabilistic factors such as target and error word frequency, word length, age of acquisition (AoA), target-error cooccurrence strength, and word association norms to determine whether speakers use any kind of probabilistic information about lexical units and grammatical constructions during spoken language production. The analyses used the data from the Russian National Corpus, Russian Word Association Thesaurus, and experimentally obtained AoA ratings for target and error words. The study involved 657 context-free sound-based noun substitution errors, 1378 context-free meaning-based noun substitution errors, 242 context-free errors that resulted in the selection of a wrong inflectional variant of the target word, and 273 naturally produced grammatical agreement errors in [Adj/Part/Pron/Num+N] modifier-head constructions. The errors were collected by tape recording and digitally recording everyday conversations, telephone conversations, and live TV and radio programs.

In most **phonological** substitution errors, the frequency of the error noun was found to exceed the frequency of the target noun. Similarly, in most **semantic** substitutions (except antonym substitutions), error nouns have higher frequencies and are acquired earlier than target nouns. At the same time, antonym errors tend to have much higher measures of target-error associative relatedness and cooccurrence strength compared to other semantic substitution types. Word length measured in syllables, while not affecting cohyponym and antonym errors, may still be predictive of the outcome of some other types of semantic substitutions. Thus, contrary to the view that the frequency effect is located at the stage of phonological encoding (Jeschaniak & Levelt 1994; Jurafsky 2003 etc.), evidence from phonological and semantic substitution errors suggests that different probabilistic factors may play a role throughout the process of lexical selection including its earlier stages such as the stage of lemma retrieval.

In substitution errors involving **inflected word forms**, frequencies of target and error inflectional variants were compared based on the frequency data from the spoken part of the Russian National Corpus. The results indicate that speakers are more likely to select higher-frequency inflected variants of a word during language production, and that both token word form frequency and type frequency are relevant to the selection of inflected word forms. These findings provide psychological evidence in favor of usage-based models of mental grammar, suggesting that usage frequency may influence the selection of a word's inflected forms, and run counter to the claim that the selection of a word's grammatical features is an automatic consequence of lexical selection (Caramazza et al., 2001; Schiller & Caramazza, 2002).

A comparison of target and error [Adj/Part/Pron/Num+N] **agreement constructions** reveals that speakers tend to substitute more frequent constructions for less frequent constructions, indicating that agreement production may be regarded as a lexical choice in which more frequent constructions are more likely to be selected. Thus, distributional patterns of relevant constructions stored in long-term memory are used in language production.

The results provide supportive evidence for the claim that speakers make use of probabilistic information about lexical units and grammatical constructions in different domains of language production, and that probabilistic factors are predictive of speech errors.

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DEPTH OF ENCODING THROUGH GESTURES IN FOREIGN LANGUAGE WORD LEARNING

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Laboratory research¹ has demonstrated that gestures enhance memory for verbal information compared to audio-visual learning in native and foreign language (L2). The enhancement produced by gestures is often discussed in terms of depth of information encoding². However, the neural base of depth of encoding is poorly understood. The literature in the field³⁻⁴ considers mainly two possibilities: one attributes depth of encoding to increased activity in brain areas specialized in semantic processing; the other, to the recruitment of multiple cortical areas, including motor regions. A recent review⁵ provides evidence for the thesis that word encoding leads to immediate neocortical involvement, i.e., to the formation of a memory trace in which, critically, the hippocampus is not involved. Accordingly, in L2 learning with gestures, depth of encoding could be specified in terms of involvement of sensorimotor brain areas. Here we employ magnetic resonance imaging to investigate encoding of L2 words. We hypothesize that encoding novel words with different modalities leads to the immediate formation of experience-related word networks in the cortex; topographically they reflect the kind of stimulus processed.

In the scanner, 32 participants learned 30 words of Vimmi, an artificial corpus created for experimental purposes in order to avoid associations with languages known to participants. The words were presented according to three learning conditions (10 items each):

- 1) visual (V): written word in Vimmi and written word in German;
- 2) audio-visual (AV): written word in Vimmi, written word in German, acoustic presentation of the Vimmi word;
- 3) sensorimotor (SM): written word in Vimmi, written word in German, acoustic presentation of the Vimmi word, and video showing an actress performing an iconic gesture.

All contrasts among conditions provided evidence for the recruitment of stimulus-specific cortical areas during encoding. Specifically, the contrast between the baseline (silence) and V shows besides the involvement of the left Broca's area visual areas. In the contrast AV versus V, we found activity in auditory cortices. Finally, in contrasting brain activity between the SM and AV-conditions, we detected significant activity in pre-motor cortices. Our fMRI study showed experience-dependent processing that possibly leads to the immediate formation of experience-dependent word networks; however, we also found hippocampal activity. After scanning, participants completed a free-recall test. Words encoded in the SM-condition were significantly better memorized than words encoded visually and audio-visually.

Our behavioral results confirm previous studies on the positive effect of gestures on memory for words in L2. Our fMRI data provide evidence that mere observation of gestures engages sensorimotor brain areas during encoding of verbal information. Accordingly, depth of encoding through gestures involves recruitment of multiple brain areas, specifically sensorimotor cortices.

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SIMULTANEOUS INTERPRETING IN HIGH AND LOW WORKING MEMORY SPAN INTERPRETERS, AND THEIR ABILITY TO COPE WITH THE ARTICULATORY SUPPRESSION EFFECT.

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Simultaneous interpreting is a complex bilingual activity that involves different cognitive and linguistic competences, such as attentional resources, language comprehension, and multiple phonological, phonetic, semantic and pragmatic subprocesses (Morelli, 2005). During simultaneous interpreting, the verbal information is presented under conditions that restrain the amount of information that can be processed (Chernov, 2004). According to Darò (1989), working memory is considered one of the key factors of this interpretation process (Darò, 1989).

Working memory is a short term memory system responsible for the temporal storage and simultaneous processing of information (Baddeley & Logie, 1999). Baddeley and Hitch's original working memory model (Baddeley, 1986, 2007, 2010; Baddeley & Hitch, 1974; Baddeley & Logie, 1999) includes the central executive, responsible for the control and regulation of cognitive processes and of the two slave subsystems: the phonological loop and the visuo-spatial sketchpad, in charge of the temporary storage of verbal and visuo-spatial information, respectively.

The aim of this work is to study the simultaneous interpreting performance in high and low working memory span interpreters, and their ability to cope with the articulatory suppression effect, that implies that the articulation of irrelevant information during a verbal task affects the normal functioning of the phonological loop, because it prevents the subvocal rehearsal of the verbal input (Baddeley, 2007, 2010; Baddeley & Logie, 1999). For that purpose, a *Simultaneous Interpreting* task, a *Digit Span with Articulatory Suppression* task, a *Listening Span with Articulatory Suppression* task, and a *Listening Span* task were administered to an original sample of 30 interpreters (26 females -86.67%- and 4 males, mean age = 39.17, $SD = 7.81$). This sample was divided into a high working memory span (9 ss.) and low working memory span (8 ss.) group, based on their performance on the *Listening Span* task. Several one-way ANOVA were conducted. Results showed that high working memory span interpreters had better performance on the *Simultaneous Interpreting* task than low working memory span interpreters [$F_{(1, 15)} = 6.24$, $MSE = 7.79$, $p = .025$], and also at the *Digit Span with Articulatory Suppression* task [$F_{(1, 15)} = 23.50$, $MSE = 18.27$, $p < .01$], and at the *Listening Span with Articulatory Suppression* task [$F_{(1, 15)} = 21.90$, $MSE = 3.14$, $p < .01$]. These findings that high working memory capacity interpreters have better performance on the *Simultaneous Interpreting* task is an indicator that working memory capacity is one of the abilities involved on the interpreting process. Also, the results found on the comparison of both groups on the *Digit Span with Articulatory Suppression* task and on the *Listening Span*

with Articulatory Suppression task indicates that high working memory capacity can be related with the ability to cope with the articulatory suppression effect, which is highly involved on the simultaneous interpreting process.

Key words: Simultaneous interpreting; Working memory capacity; Articulatory suppression

ATTRACTION ERRORS IN CASE AGREEMENT: EVIDENCE FROM RUSSIAN

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The agreement attraction ((1) *[[The path] to the monuments] were...” underlined word is an attractor) has been a subject to scrutiny during the last decades. The main observations were the asymmetry of the error patterns (only the plural feature could elicit errors), the similarity of the effects in production and comprehension and another asymmetry between grammatical and ungrammatical sentences (only in comprehension – no effect of attraction in correct sentences). The theoretical explanations fall into 2 main groups (a) feature percolation; (b) cue-based retrieval. According to the (a) the feature of the attractor percolates upwards to the head noun, causing wrong representation, that violates the agreement. The (b) suggests that while retrieving the head noun the cues can cause the temporary agreement with the wrong noun. The Pl/Sg asymmetry was explained by the markedness of the former or the defaultness of the latter.

We report data from the production experiments on case agreement errors which are common in Russian. The attractor is a syncretic form of adjective, where Pl. Loc. = Pl. Gen (2).

(2) Mozaiki [v [novyx xramax/* xramov]]...(attractor is underlined)

Mosaic Pl Nom [in [new Pl Loc (=Gen) church Pl Loc/* Pl Gen]] ...

Design and materials. The task was to listen to the beginning of a sentence, to repeat and continue it using the words on a screen, one of which required modification for the case agreement. We manipulated the case required (Gen/Loc) and the linear distance from the preposition (close/distant), using 2*2 square design with 10 stimuli per condition, adding 80 fillers. **Results.** The results (N=21) showed, that the attraction mistakes were elicited only when the Loc was required (i. e. Gen. instead of Loc., total number of mistakes – 37), with more distant preposition eliciting more errors (errors in 18.9% of the sentences, 91.9% of all mistakes).

Discussion. The Gen/Loc asymmetry can't be explained by defaultness/markedness. We propose to use the paradigms of directional syncretism to explain this, as it provides the hierarchical structure of the case, unlike other paradigms of feature syncretism. According to it, in Russian case system the Pl Gen value doesn't have its own form and is defined through a reference to Pl Loc value. This can be compared to the defaultness/markedness effects, producing inequality of the feature values. This can be extended to the number/gender features and suggests that values within a given feature are organized in asymmetrical and possibly hierarchical way.

Comparing these results to the ones obtained in the studies of the same mistakes in comprehension, we find a striking asymmetry. In the recent self-paced reading experiments the smaller slow-down effect was observed for both Gen and Loc attraction errors, although at a different magnitude (effects for Gen are larger both in agreement and in usual mistakes). This suggests that the processes underlying the phenomenon are different for production and comprehension, and case value shows more pronounced difference. There are two possible explanations: 1) number/gender features can be different from case feature in terms of agreement mechanisms; 2) the structural relation for the studied attraction pattern is different from the one studied before with number/gender features (compare (1) and (2)), so the attraction itself can work differently in our case. It is crucial to investigate this problem further cross-linguistically.

In any account, the percolation theory cannot provide a realistic explanation for the studied pattern because the attractor itself should agree with the noun and it is highly unlikely that the Gen value can percolate to the preposition, as the prepositions don't have cases, but rather assign them. Cue-based retrieval seems to be more probable explanation, if the error occurs at the stage of the re-check when a syncretic feature of attractor creates a misleading effect.

Keywords: agreement attraction; production; cue-based retrieval; percolation

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DOMAIN GENERALITY OF LEARNING NON-ADJACENT DEPENDENCIES: EVIDENCE FROM VISUAL STIMULI

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Non-adjacent dependencies (NADs) refer to dependencies between items that are not adjacent in a sequence. Peña et al. (2002) found that adult participants were able to learn NADs between syllables in an artificial language when there were 25ms pauses before and after the NADs. Later studies using videos of human body movements showed similar learning effects, and such learning did not depend on the viewing angle of the stimuli (Endress & Wood, 2011). One could interpret these findings as evidence that mechanisms for detecting NADs are domain-general, however, human body movements may be special visual stimuli because, 1) representations and processes involving human forms may be privileged, 2) movement may facilitate detection of NADs. In six experiments, the present study further probes the constraints in learning NADs in visual sequences. The findings shed light on mechanisms involved in the detection and representation of NADs in language.

The structure of the training and testing stimuli in these experiments were similar to Peña et al. (2002), with nine syllables replaced with: nine abstract images (E1), nine rotating objects (E2), nine continuous movements and transformations of a flat surface (E3), nine images of different postures of the flat surface (E4), nine continuous body movements performed by an animated person (E5, similar to Endress & Wood, 2011), and nine images of body postures of the same person (E6). In the training set, nine triplets were created by pairing each of three pairs of NADs ($a_b_c_d$, e_f , with each letter representing an image or movement) with each of three middle items (x,y,z), and 20 repetitions of the triplets were randomly concatenated into a continuous visual stream. Each image or movement was presented for 625ms, with 125ms of pauses between the triplets, resulting in 6 minutes and 22 seconds of exposure to the stimuli. In E3 and E5, each movement started from and ended in a neutral rest positions (flat surface or upright body, respectively). In all six studies, pauses were implemented as a blank screen. The training stimuli faded in and out over 5 seconds. After exposure to the training set, participants were tested on their preference between two kinds of triplets: (1) Rule-Triplets: Three-item sequences with the correct NADs paired with unattested middle items (e.g., acb), and (2) Part-Triplets: Three-item sequences spanning two triplets (e.g., xbc). Rule-triplets and part-triplets differed in two major ways: 1) participants were exposed to part-triplets during training, but not to rule-triplets; 2) rule-triplets contained the same NADs as trained triplets.

100 native English-speaking subjects participated in six experiments, with 20 subjects per experiment. Participants considered rule-triplets to be more familiar than part-triplets when the stimuli were movements of the flat surface (E3), human movements (E5) and human body postures (E6, $p < .05$ in all three experiments). However participants did not show any preference with abstract images ($p = 0.904$). For rotating objects, there was a trend towards endorsing part-triplets over rule-triplets ($p = 0.051$).

We propose that, (1) acquisition of NADs is facilitated by detection of the edges of sequences, resulted from the pauses; (2) detecting edges in the context of rapidly changing visual material is facilitated when the sequences are linked, as with continuous movement (E3 & E5) or perceived movement (E6). This hypothesis accounts for the present data. Further, it

also suggests that results in Peña et al. (2002) might involve mapping the syllables sequences to motor sequences which produced the syllables (Liberman et al., 1967), similar to body movements. This hypothesis is supported by the findings that participants failed to learn NADs of tones with pauses bracketing the sequences. (Li and Mintz, 2014).

Key-words: Statistical Learning, Non-Adjacent Dependencies (NADs), Sequence Learning

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PHI-FEATURE INTERACTION IN PROCESSING: EVIDENCE FROM RUSSIAN

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Introduction. In a morphologically complex language, one must simultaneously deal with multiple features on many words when processing a sentence. This paper addresses the question how these features interact. We look at a certain type of case errors in Russian and try to figure out how number and gender features influence the detection of these errors.

To have case errors that have been studied before, we took the ones described by Slioussar and Cherepovskaia (2014) (henceforth S&C). In Russian, some adjective forms are ambiguous, in particular, Gen.Sg=Dat.Sg=Ins.Sg=Prep.Sg (*Prep* is *Prepositional case*) for feminine forms and Gen.Pl=Prep.Pl for all genders. S&C looked at case errors on nouns after an ambiguous adjective, as in (1a-c) (they used prepositions taking Gen, Prep and Dat/Acc as a control case). They showed that in cases like (1b) the violations were detected significantly later than in cases like (1c) and argued that the phenomenon is similar to subject-predicate agreement attraction.

- (1) a. *Neudachi v proshlyx sezonax zastavili komandu potrudit'sja* ‘failures in previous_{PREP.PL} season_{PREP.PL} made (the) team work’
 b. *Neudachi v proshlyx sezonov...* ‘failures in previous_{PREP.PL(=GEN.PL)} season_{GEN.PL} ...’
 c. *Neudachi v proshlyx sezonam...* ‘failures in previous_{PREP.PL(≠DAT.PL)} season_{DAT.PL} ...’

Our study. In (1a-c), the head noun of the subject DP is feminine plural, while the dependent noun is masculine plural. We wanted to know how number and gender features on these nouns (their values, whether they are matched) influence the detection of case errors. We conducted three self-paced reading experiments and reanalyzed data from one S&C’s experiment that were kindly given to us (where they looked at singular nouns and balanced their gender). Target sentences always had the structure in (2). The combinations of number and gender features on N1 and N2 tested in different experiments are presented in Table 1.

- (2) N1 P (taking Gen, Prep or Acc/Dat (used as control with Sg/Pl nouns)) Adj (ambiguous or unambiguous (control)) N2 + three more words

Table 1. Number and gender features on head and dependent nouns (N1 and N2) in different experiments

	N1	N2
Exp.1	Sg/Pl M/F	Sg F
Exp.2	Sg/Pl M/F	Pl F
Exp.3	Pl M	Pl M/F
S&C’s Exp.	Sg M/F	Sg F

Summarizing results from all experiments, we conclude that gender mismatch causes significantly smaller slow-down in the region following the error (i.e. M-F << F-F and M-F << M-M). As for number, combinations with plural took longer (i.e. Sg-Sg << Pl-Sg, Sg-Pl << Pl-Pl). The pattern is the same for all cases (but the results reach significance only when the data from all cases are collapsed) and for all error types (i.e. for the ones like in (1b) and like in (1c)).

Conclusions. (1) We know from agreement attraction studies that in ‘N1 P N2 + predicate’ sentences the values of number feature on N1 and N2 and whether they are matched influences the detection of number errors on the verb. In this study, we show that how errors in one feature (case) are detected is influenced by matching and values of other features (number and gender). (2) Semantically, number and gender features are of different nature: with some exceptions like *Pluralia Tantum* nouns, number has a semantic impact, while gender usually does not (we did not use animate nouns where it does in our experiments). We showed that they also behave differently with respect to case error detection: for gender, it

matters whether features are matched or mismatched, while in case of number, working with plural takes more time.

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Keywords: sentence processing; Russian; number; gender; case; attraction.

PROSODIC BOUNDARIES HELP INFANTS LEARN NON-ADJACENT DEPENDENCIES IN NATURAL LANGUAGE

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This study investigates the role of prosodic boundaries in infants' learning of non-adjacent dependencies (NAD). Previous studies demonstrated pattern learning and word categorization from artificial languages by infants and adults (e.g., Marcus et al. 1999; Peña et al. 2002; Newport & Aslin 2004; Gomez 2002; Gomez & Gerken 1999; Gomez & Lakusta 2004). With regard to natural languages, Santelmann and Jusczyk (1998) showed that 18-month-old American infants recognized non-adjacent syntactic relationship (e.g., between the auxiliary *is* and the verb morpheme *-ing*). Similar sensitivity was found in German-learning 19-month-olds (Höhle, et al., 2006). Van Heugten & Shi (2010) showed that French-learning infants at 17 months, but not at 14 months, can track NAD across a phonological phrase boundary. Gerken, Wilson & Lewis (2003) found that American 17-month-olds exposed to Russian were able to abstract distributional patterns across non-adjacent elements that corresponded to gender category agreement.

Using a preferential looking procedure, we examined 11-month-old Canadian infants' ability to track non-adjacent dependencies between determiners and noun endings when the non-adjacent elements were both at phonological phrase boundaries versus when one of the elements was not at a phonological phrase boundary. Our hypothesis was that the former should yield better learning of NAD than the latter. Accordingly, stimuli in two structures were created: noun phrase (NP) condition ([Det+Noun+Adj]) and sentence condition ([Det+Noun]+[V]). We used four Brazilian Portuguese determiners (*nossa/essa/meu/seu*, "our/this/my/your") that were divided into two sets and combined with bi-syllabic *e-* versus *o-* ending pseudo-nouns. For the third word in the utterances, we used pseudo-adjectives with *-il* ending or pseudo-verbs with *-iu* ending, both endings having the same pronunciation [iw] in Brazilian Portuguese. In the familiarization phase, infants were randomly assigned to one of the two conditions. In the NP condition, one group of infants heard utterances with *nossa* and *essa* preceding *o-* ending pseudo-nouns and *meu* and *seu* preceding *e-* ending pseudo-nouns. In both cases, pseudo-nouns were followed by *il-* ending pseudo-adjectives. Another group of infants heard the reverse pattern. In the sentence condition, one group of infants heard *nossa* and *essa* preceding *o-* ending pseudo-nouns, and *meu* and *seu* preceding *e-* ending pseudo-nouns. In both cases, pseudo-nouns were followed by *iu-* ending pseudo-verbs. Another group of infants heard the reverse pattern of pairings.

In the test phase, all infants listened to new stimuli containing the familiarized determiners preceding new *o-* or *e-* ending pseudo-nouns. The pseudo-adjectives (for the NP condition) and the pseudo-verbs (for the sentence condition) were also new. For each infant, half of the test trials were grammatical and the other half ungrammatical. The two types of trials were defined according to the familiarization pattern. The grammaticality of trials was therefore crossed for the two groups of infants under each condition.

Infants in the sentence condition ($n = 16$) yielded significant looking time differences while listening to grammatical versus ungrammatical test trials ($p = .038$). In the NP condition ($n = 16$), infants showed no looking time difference between the two types of test trials ($p = .71$). Thus, after a brief exposure to a novel language, Canadian 11-month-olds learned the NAD patterns and generalize them to new stimuli, but only when the non-adjacent elements were both aligned with phonological phrase boundaries. These results demonstrate that babies under one year of age use phonological phrase boundaries to acquire syntactic regularities.

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THE PERCEPTION OF RHYTHMIC SPEECH: DYSLEXIA AND MUSICALITY

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It has often been observed that humans tend to group tone or syllable sequences that vary in intensity as strong-weak, whereas they group sound sequences that vary in duration as weak-strong (e.g., Woodrow, 1909). Likewise, across languages and cultures, word- and (musical and linguistic) phrase-initial stress is marked by intensity, whereas final stress is marked by duration. Due to this parallel, Hayes (1995) proposed a general auditory principle that guides rhythmic perception, the Iambic/Trochaic law (ITL; Hayes, 1995).

Recent studies indicate that language experience affects rhythmic grouping. For example, French speakers have weaker grouping preferences than German speakers, especially if the stimuli are intrinsically complex (e.g., Bhatara et al., 2013). Following the stress “deafness” hypothesis (e.g., Dupoux et al., 1997), the authors suggest that French speakers, lacking word stress in their native language, encode the streams at a lower level than German speakers, who might draw on abstract prosodic representations, as their native language has lexical stress.

This account can be put under test by examining dyslexics, who are assumed to have higher-order phonological representation deficits (Snowling, 2000; Ramus, 2003). Interestingly, some aspects of phonological processing are enhanced in dyslexics if they are trained musicians (e.g., Bishop-Liebler et al., 2014), suggesting they benefit from cross-domain transfer. Hence, we hypothesized that dyslexics have weaker grouping preferences than non-dyslexics, and that musicality affects rhythmic speech perception.

Methods. 14 German-speaking adults with a history of diagnosed developmental dyslexia and 14 controls were tested (so far; goal: 20/group). We used Bhatara et al.’s (2013) grouping task: they had to listen to nonsense speech sequences in which syllables alternated in duration (e.g., ...boomuzeeli...), intensity (e.g., ...BEluMOle...), or neither (e.g., ...bezilemo...), and had to indicate whether they perceptually grouped syllables as strong-weak or as weak-strong. Afterwards, they completed standardized tests on their musical receptivity for melody and rhythm (MET; Wallentin et al., 2010) and on other cognitive abilities.

Results. A mixed logit model with fixed and random factors revealed that dyslexics gave more weak-strong responses in the duration condition, and more strong-weak responses in the intensity condition than expected by chance. In the control condition, they had no significant preference for a grouping. A second model included group, condition and musical receptivity for rhythm and melody as fixed factors. For condition, we coded a contrast comparing grouping preferences between (a) intensity- and duration-varied stimuli, and (b) between duration-varied and control stimuli. Results revealed that dyslexics had weaker grouping preferences than non-dyslexics ((a) $p < .001$, and (b) $p < .05$). Moreover, musical receptivity for rhythm ($ps < .001$) but not for melody affected grouping preferences by both groups.

Discussion. Grouping preferences are influenced by musical receptivity for rhythm, but not for melody. This meets the assumptions of the ITL as a domain-general auditory principle, but suggests that transfer between music and language is selective. Moreover, dyslexics’ grouping preferences were weaker than those by non-dyslexics. This is expected in light of their phonological deficit: it seems that dyslexics—just like the French in prior studies—do not benefit from higher-order prosodic representations when encoding rhythmic speech.

Keywords: Iambic/Trochaic Law; Rhythmic Perception; Dyslexia; Musicality; Cross-domain Transfer

TRANSFER OF THE IAMBIC-TROCHAIC LAW ACROSS AUDITORY DOMAINS IN INFANTS

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The Iambic-Trochaic Law (ITL) states that elements alternating in pitch or intensity are grouped trochaically (high-low) and elements alternating in duration are grouped iambically (short-long). The ITL grouping principle has been observed over linguistic units (Bion et al., 2011), pure tones (Hay & Diehl, 2007) and even over visual events (Peña et al., 2011). The ITL is therefore a domain general perceptual phenomenon. In language, the ITL has been proposed to account for the word secondary stress (Hayes, 1995) and for phonological phrase prominence that correlates with the word order of the language (Nespor et al., 2008). The ITL could therefore help young infants to discover the structure of their native language. However, young infants fail to group syllables alternating in duration until the very end of the first year of life (Bion et al., 2011). Here we therefore test if young infants could learn the grouping principle from another perceptual domain – namely from pure tones. We therefore tested transfer of ITL between the linguistic (syllables) and non-linguistic auditory domain (pure tones).

To do this we designed an experiment where infants listened to three examples of iambic (short-long) or trochaic (high-low) examples of tone or syllable pairs and were then presented with a test pair that could be in the same domain (syllables to syllables / tones to tones) or across domains (syllables to tones / tones to syllables). The test events could adhere to the ITL or violate it by placing the prominence on the wrong element. Because the experiment contained too many different conditions we could not use traditional looking-time measures that are too long. We therefore used the pupil size measure to investigate any consistent and statistically significant differences between auditory stimuli where the context and the target stimuli matched in prosody and where they mismatched.

When comparing the pupil response in the Syllable-to-Tone conditions where prominence is signaled through duration, the test events that adhered to the ITL showed larger pupil dilation than test events that did not adhere to the ITL between 1s and 2s after test event onset. In the Syllable-to-Tone conditions where prominence is signaled through pitch, the test events that adhered to the ITL showed a larger pupil dilation than the test events that did not adhere to the ITL during .5s and 2s window and then again at 2.5s and 3s time window. In the Tone-to-Syllable conditions where prominence is signaled through pitch, the test events that adhered to the ITL showed a larger pupil dilation than the test events that did not adhere to the ITL during .5s and 2.5s time-window. However, in the Tone-to-Syllable conditions where prominence is signaled through duration, the test events that did not adhere to the ITL showed a larger dilation than test events that did adhere to the ITL between 1.5s and 3.s time interval. We are in the process of finishing the experiment where the context and the test events fall in the same domain (syllables-to-syllables / tones-to-tones).

Because pupil dilation in these kind of tasks is related to the pleasantness of the test events in relation to the context pairs, it appears that 7-month-old infants prefer trochaic tone and syllable pairs when prominence is signaled through pitch regardless the direction of the transfer task (syllables-to-tones / tones-to-syllables), but only prefer iambic tone pairs when prominence is signaled through duration (transfer direction from syllables-

to-tones). However, they violate the ITL when the transfer is from tones to syllables and appear to prefer trochaic grouping over syllables even when prominence is signaled through duration. The results suggest that transferring prominence signaled through duration from tones to syllables would result in a violation of ITL. The results described here show that if infants would rely on their knowledge of non-linguistic sounds they would consequently fail to acquire the ITL in language.

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Early development of turn taking in vocal interaction between mothers and infants

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Infants are known to engage in conversation-like exchanges from the end of the second month after birth. These ‘protoconversations’ involve both turn-taking and overlapping vocalization. Previous research has shown that the temporal organization of adult-infant turn-taking sequences is similar to that of adult verbal conversation. It has also been shown that young infants adjust the quality of their vocalization in response to the quality and timing of adult vocalization. We present new evidence of turn-taking interaction in infants aged between 8 and 21 weeks based on the analysis of 176 samples of naturalistic face-to-face interactions from 51 dyads. We found high levels of latched turns in turn-taking at all ages as well as frequent initiation of turn-taking by infants at all ages. Our data do not support the hypothesis that turn-taking ability increases with age between 2 and 5 months but do suggest that infants are active participants in turn-taking from the earliest age and that mothers adjust turn-taking formats to infants.

Keywords: *Early mother-infant communication, turn-taking, protoconversation, vocal development*

THE COGNITIVE PROCESSING OF SYNTACTIC INFORMATION: A STUDY OF RELATIVE CLAUSES WITH SUBJECT AND OBJECT EXTRACTION IN SPANISH

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Abstract

The study of the processing of syntactic components in relative clauses with subject (S) and object (O) extraction was studied in several languages: English (e.g. Fodor, Bever, & Garrett, 1974; Wanner & Maratsos, 1978; King, & Just, 1991), French (Frauenfelder, Seguí & Mehler, 1980) and Spanish (Hoover, 1992; Betancort, Carreiras & Sturt, 2009, del Río et al., 2012), etc. In general, these studies showed differences in the processing of S and O relatives, being O a more complex clause. The accumulated evidence points that difficulties in processing the O relative could be due to a combination of syntactic, functional, discursive, semantic and experience-based factors (the frequency of occurrence). In this research, we focus on the purely grammatical aspects. The flexibility of the surface structure in Spanish provides an interesting case study to evaluate the grammatical complexity. Specifically, the aim of the study was to analyze the comprehension of relative clauses in Spanish with S and O extraction, distinguishing its various forms, and to infer the syntactic factors (such as canonical order [CO] and syntactic marking [SM]) that seem to influence in the complexity of semantic interpretation (processing costs). Also, a study on frequency of occurrence was included. The selected structures had very similar surface features, but different syntactic and semantic behaviour.

Table 1: Description of each structure (E) according to the alternatives taken for each factor.

E	Extraction		CO		SM		Examples
	S	O	Yes	No	Yes	No	
1	X		X			X	La niña que mira al hombre cruza la calle. [The little girl looking at the man is crossing the street. SVO]
2		X		X		X	La niña que mira el hombre cruza la calle. [The little girl being looked by the man is crossing the street. OVS]
3		X		X	X		La niña a la que mira el hombre cruza la calle. [The little girl to whom the man is looking is crossing the street. OVS]
4		X	X			X	La niña que el hombre mira cruza la calle. [The little girl that the man is looking at is crossing the street. OSV]
5		X	X		X		La niña a la que el hombre mira cruza la calle. [The little girl to whom the man is looking is crossing the street. OSV]

First, an analysis of the frequency of occurrence on different structures in a corpus of local language was done. Second, two experimental tests were taken: a test of spontaneous understanding (role allocation) and a forced-choice task with a time limit; then, the amount of errors was calculated. The analysis of the frequency showed E1 and E4 having higher frequency and the remaining structures having lower frequency. The data obtained in tests 1 and 2 was similar: E1 and E4 structures were easier to understand, whereas E2 was the most difficult. In sum, this revealed that the syntactic factors that facilitate the understanding of these kinds of sentences are CO and subject-extraction, while the frequency would have a favorable impact on the understanding of such sentences.

Keywords: Syntactic Processing; Comprehension of Relative Clauses; Subject and Object Extraction; Canonical Order; Syntactic Marking.

A COMPARATIVE STUDY ABOUT METACOGNITIVE LANGUAGE TRANSFER ON READING COMPREHENSION STRATEGIES IN BRAZILIAN PORTUGUESE AND IN ENGLISH AS A SECOND LANGUAGE

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Metacognition, self-monitoring of any cognitive enterprise (FLAVELL, 1981) and linguistic transfer, the transposition of knowledge from a firstly acquired language by the learner to his/her performance in the target language (ODLIN, 1989) are phenomena expressed on reading comprehension, a communicative and linguistic activity which includes cognitive and metacognitive proceedings, the last can be exemplified as a rereading a text activity (KLEIMAN, 1998). Considering this, this paper which is a result of a dissertation, aimed to develop a theoretical and an empirical alliance among metacognition, linguistic transfer and reading comprehension, by investigating the transfer of metacognitive reading strategies between Brazilian Portuguese and English as a second language, verifying types and frequency of metacognitive reading strategies use in L1 and L2 in two university courses with different formation backgrounds, besides of observing the possible manifestation of the linguistic transfer phenomenon on metacognitive reading strategies.

After a literature review, an empirical study has been implemented with 16 university students of a Language and Literature course and with 16 Business students, both groups with proficiency in English of 50% in the reading part of a sample of TOEIC. The participants solved a reading comprehension test in Portuguese and English on the computer through a retrospective written protocol, an elicitation activity in which the participants report their reading thoughts in specific parts of the texts (BROWN and RODGERS, 2002). After that, the metacognitive reading strategies used were classified through an adaptation of the taxonomy of Filho (2002), Joly, Cantalice e Vendramini (2004), Joly, Santos, Marini (2006) and Joly (2007). Accuracy on multiple-choice questions was computed and the levels of the summaries produced were analyzed through Carrell's (1992) taxonomy, top, high, medium and low level, a taxonomy that considers the presence of main and secondary ideas.

Data were analyzed quantitative and qualitatively in an inter-and intragroups analysis. The inter-groups analysis indicated a considerable padronization in type and frequency of metacognitive reading strategies used in the instruments. The main difference was in the main access to previous knowledge in both instruments by the Language and Literature group in relation to the Business group. The Language and Literature course students used more metacognitive reading comprehension strategies in relation to the Business ones in both instruments, in Brazilian Portuguese (L1) and in English (L2).

Moreover, there was a partial occurrence of metacognitive reading strategies transfer in Brazilian Portuguese and in reading comprehension in English and vice-versa. The homogeneity on type and frequency of use of reading strategies may indicate the presence of transfer of metacognitive reading strategies in an unconscious level or the existence of common reading procedures used by speakers of different languages and with different academic backgrounds, along with possible cognitive patterns on this activity.

Keywords: metacognition; linguistic transfer; reading

SELF-ASSESSMENT LANGUAGE PROFICIENCY: A STUDY OF THE RELATION BETWEEN ACADEMIC EDUCATION AND SIGNED LANGUAGE PROFICIENCY OF HEARING TEACHERS

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This paper shows the results of an exploratory study using the QueHLAP (Language history and proficiency self-assessment questionnaire) designed for bimodal bilingual hearing teachers – Libras – Brazilian Portuguese. The objective of this work is to understand the relation between teachers academic education through a self-assessment language proficiency questionnaire. To accomplish our goal we designed a questionnaire, called QueHLAP, based on the LEAPQ(MARIAN; BLUMENFELD; KAUSHANSKAYA, 2007), SLSCO - Sign Language Skills Classroom Observation (REEVES et al., 2000) the Language Attitude Questionnaire (KAUFMANN, 2010). The language instrument developed for this research was thought according to the context of hearing teachers signers of Brazilian sign language, considering seven areas to increase the efficacy and validity of the questionnaire, as follows: (1) Personal identification; (2) Family characteristics; (3) Academic Formation; (4) Language background; (5) Language Proficiency; (6) Usage and language interaction; and (7) Metalanguage. The methodology adopted the instrument validating was its application in 15 of the 19 schools in this state, reaching a total of 45% of the teachers who work in deaf schools in the state of Rio Grande do Sul. The analyzes of the results were based on the comparison between the relation of academic background, the level of language proficiency stated by the participants, their age of language learning and the language frequency of use.

Key words: Self-assessment language proficiency questionnaire- bimodal bilingual teacher training - Bimodal bilingualism

**IS PRASLI THE SAME AS PLI? ON THE POSSIBILITY OF SELECTIVE
IMPAIRMENT AT THE GRAMMAR-PRAGMATICS INTERFACE AND ITS
RELATION TO LEARNING DISABILITY**

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This work aims at investigating the specificity of Pragmatic SLI (PraSLI) and its relation to Learning Disability (LD). *PraSLI*, term coined by Friedmann and Novogrodsky to name one of the subtypes of SLI [1-2], is equivalent to what is usually presented as Pragmatic Language Impairment (PLI) [3-4], characterized by the production of well-formed linguistic expressions though inappropriate for the context in which they occur. It also includes difficulty in the comprehension of non-literal meaning, reference assignment, and inference making [5]: the last two problems largely shared by LD children [6-7]. Since the term *PraSLI* has domain specificity as one of its possible readings, in this paper, the terminological equivalence PLI=PraSLI is called into question and the possibility of an impairment specific to the language processing abilities pertaining to GPI (PraSLI as a subset of PLI) is investigated. GPI is conceived of in the context of the Minimalist Program [8-9]. It is assumed that the formal features of functional elements of the lexicon interact with Intentional Systems (ISs), insofar as they codify intentional information pertaining to illocutionary force and reference to entities and events [10]. ISs are viewed to include pragmatic knowledge, and in particular, a Relevance Theory (RT) component [11], which is accessed during on-line processing [12]. GPI accounts, therefore, for the grammatical encoding of information pertaining to reference, which is legible at the interfaces between language and the performance systems. Ostensive (marked) morphology and ostensive prosody are viewed as resulting from the interaction between RT and the lexicon at GPI in the on-line computation of linguistic expressions. PraSLI children would then show difficulties in encoding and recognizing grammatically relevant distinctions, as well as drawing inference based on them. Although there may be different unrelated causes to the same types of symptoms, it is possible that LD has as one of its causes processing difficulties at GPI. This question is investigated by examining whether LD Brazilian-Portuguese-speaking school children would behave as predicted for PraSLI. Five experiments focusing on GPI were conducted. Two of them elicited the production of definite/indefinite reference, and the other three the comprehension of inferences dependent upon grammatical contrasts pertaining to functional categories (definiteness, aspect, and mood – with/without ostensive prosody). A comprehension experiment involving inferences based on non-literal meaning (i.e. a not-GPI-task) was also carried out. 142 children (7;0-11;0) (69 LD; 73 control) previously submitted to syntactic assessment were tested in the GPI tasks, being 52 out of them also tested in the not-GPI-task. LD children had difficulty in producing definite/indefinite reference and in recognizing ostensive morphological and prosodic information. Their scores were significantly lower than those of the control group in all the tasks. The results suggest that impairment at GPI may account for 58% of LD cases. In addition, there were children whose performance in the not-GPI-task was on average, but below average in GPI tasks, and vice-versa. The possibility of PraSLI as a selective deficit at GPI cannot be discarded.

Keywords: Specific Language Impairment; Pragmatic Language Impairment; Minimalism; Functional Categories; Grammar-pragmatics Interface; Relevance Theory; Ostension; Learning disability; Inference; Reference.

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THE EFFECT OF CROSS-LANGUAGE FORM SIMILARITY ON BILINGUAL CHILDREN'S WORD RECOGNITION

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Evidence from the last 15 years of psycholinguistic research on bilingualism has shown evidence that bilingual lexical access is non-selective. This evidence is strongly founded on the finding that bilinguals are faster to recognize and name cognates (i.e. *piano-piano*) than non-cognates (i.e. *lápis-pencil*), control words. Despite the vast body of evidence suggesting a non-selective process of bilingual lexical access, most studies have been conducted with *adult* bilinguals. Nonetheless, there is still a lack in the literature for lexical access studies performed with bilingual *children*. In this study we analyzed the performance of 53 Portuguese-English bilingual children, ages 8-9, on lexical decision tasks in both their first language (Portuguese) and second language (English). In both tasks, half of the word stimuli were Portuguese-English cognate words, such as *piano*, and half were non-cognates, such as *lápis-pencil*. Cognates and non-cognates were matched in lexical frequency. Bilinguals' performance on the English task was compared to performance of monolingual English speakers. It was hypothesized that bilingual children would benefit from the form similarity of cognates, and more quickly identify words like *piano*, compared to words like *pencil*. Monolingual children, on the other hand, would should similar response times to both types of words. Results supported our hypothesis. Portuguese-English bilingual children responded faster to cognates than to non-cognates, but only when performing the task in their L2. When they performed the task in their L1, there was a marginal effect in the opposite direction: they were faster to respond to non-cognates. These results are discussed in terms of proficiency and age of acquisition of the L2 and models of bilingual language representation.

Keywords: bilingualism, lexical access, children, cognate effects

PAST TIME REFERENCE IN NON-FLUENT APHASIA

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A large number of studies in Aphasiology have analyzed the difficulty that non-fluent aphasic patients present when making a reference to a past event, investigating such difficulty mainly through controlled experimental tasks (Bastiaanse, 2008; Bastiaanse et al. 2011; Bastiaanse, 2013). However, the analysis of spontaneous speech with the purpose of improving the description of this linguistic phenomenon common to these aphasic patients is still problematic (Prins & Bastiaanse, 2004). Within this context, the present study aimed to investigate the difficulty non-fluent aphasic patients present when making reference to a past event throughout the analysis of spontaneous speech production of Brazilian Portuguese, focusing mainly on a linguistic phenomenon that results of aphasia - paraphasia. In relation to morphemic paraphasia, the goal was to examine the extent to which the participants tested were able to talk about past events using appropriate tense-aspect morphology. A total of seven participants with non-fluent aphasia who suffered an ischemic cerebrovascular accident were tested. Aphasia diagnoses were made by neurologists and confirmed by speech therapists based on the Boston Diagnostic Aphasia Examination (Goodglass & Kaplan, 1982; Radanovic & Mansur, 2002). An adaptation of the Autobiographical Memory Interview (Kopelman, Wilson & Baddeley, 1990) was used to elicit oral production. The answers given by the participants were recorded. In addition to the language skills evaluated with the Boston Diagnostic Aphasia Examination, other neuropsychological abilities were accessed through a cognitive screening battery which included subtests of attention, working memory, episodic, semantic and nonverbal memory, perception and oral and written language (*Instrumento de Avaliação Neuropsicológica Breve – Neupsilin*; Fonseca, Salles & Parente, 2008). Results indicated that when the cases of morphemic paraphasia occurred in the production of verbs, participants showed difficulty with the use of both tense and aspectual morphological markers, mainly in contexts which demanded reference to past events, omitting or substituting such morphological markers. According to our results, it was possible to observe a difficulty related to verb production and this difficulty was associated to past reference. When referring to a past event, speech time and event time do not coincide, which means that a relation should be established between speech time and an earlier event and this relation is called *discourse linking* (Bastiaanse et al., 2011; Bastiaanse, 2013; Avrutin, 2006; Zagona, 2003).

Keywords: spontaneous speech, non-fluent aphasia, paraphasia, time reference.

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BIMODAL BILINGUALISM: ANALYSIS OF THE NARRATIVES OF CHILDREN OF DEAF PARENTS

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The bimodal bilingualism has been the subject of studies by many researchers who seek to investigate how the acquisition of two languages from different modalities works, oral / auditive and visual/spatial. Aiming to understand the relationship of children with sign language (Libras – Language Sign Brazilian) and spoken language (BP – Brazilian Portuguese), the interest is in studying the narrative ability of children of deaf parents (Codas or Kodas), who are naturally acquiring spoken and signed language. The narratives used in this research are part of the database of the project "Development Bilingual Bimodal: study interlingual between deaf children with cochlear implants and hearing children signing" developed in Brazil under the coordination of Prof. Dr. Ronice Muller de Quadros in partnership with the United States, allowing the comparison of two pairs linguistic: a) LSB and BP; b) American Sign Language (ASL) and English. For this study were chosen narratives (Libras and BP) from seven bimodal bilingual children and one bimodal bilingual adult. The aim of this study is to analyze the narratives of these eighth bimodal bilingual subjects. The productions of the children were collected by the researchers of the project BiBiBi and the narratives were transcribed through the software ELAN (*Eudico Linguistic Annotator*) by transcribers fluent in Libras and BP. The narratives are generally the type of text with which children have their first contact, because in all cultures man recounts his experiences through language and in child development the action of narrating fictional or real events is observed. In this study, it is assumed the proposal Labov and Waletzky (1967), which presents the narrative as a method of summarizing experiences structurally divided into: abstract, orientation, complication, evaluation, resolution and coda. The analysis shows that the narratives exhibit typical characteristics of each modality, oral/auditive or visual /gesture and the structural elements of the Labov and Waletzky. Despite the elaborate stories, belonging to different languages, the work showed that the child is developing narrative competence in spoken language and sign language, without a language to excel the other.

Keywords: Narratives. Bimodal Bilingualism. Brazilian Sign Language. Brazilian Portuguese.

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DISCRIMINATION OF BRAZILIAN PORTUGUESE OPEN-MID VOWELS AND CLOSE-MID VOWELS BY NATIVE SPEAKERS OF ARGENTINE SPANISH: A PERCEPTUAL STUDY

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Perceptual studies have been largely conducted in Brazil since the last decade, especially the ones that shed light on identification and discrimination of English sounds by native speakers of Brazilian Portuguese. Conversely, there are few studies that focus on Spanish-Portuguese interphonology (ALLEGRO, 2010; MARCHRY DA SILVA, 2014), concerning how native speakers of Spanish perceive auditory contrasts related to the Brazilian Portuguese sound system. Given the necessity to better understand such process, the present study, which was based on the work by Feiden, Alves and Finger (2014), aimed to investigate how native speakers of Argentine Spanish perceive mid vowels of Brazilian Portuguese in terms of categorical discrimination rates. More specifically, we intended to determine whether the participants were able to discriminate between the front *close-mid* vowel [e], as in the first syllable of the word *dedo* ('finger'), and the front *open-mid* vowel [ɛ], as in the first syllable of the word *vela* ('candle'), when presented together in the pair [e-ɛ]. We also sought to verify whether the participants were able to discriminate between the back *close-mid* vowel [o], as in the first syllable of the word *boca* ('mouth'), and the back *open-mid* vowel [ɔ], as in the first syllable of the word *poté* ('pot'), when presented together in the pair [o-ɔ]. Eleven high school students ($M = 17$ years old), native speakers of Argentine Spanish, took part in the study. All participants filled in a Student Information Questionnaire, in which learners provided information on their background in the second language, as well as other extralinguistic details on their learning of Brazilian Portuguese. In order to determine their perceptual accuracy regarding the front and back close-mid and open-mid vowels, the participants performed a categorical discrimination test composed of 96 stimuli (which were presented twice), resulting in 192 stimuli heard. Regarding the preparation of the test, we selected Brazilian Portuguese minimal pairs whose words were formed by four segments and two CV syllables (the first syllable was stressed). The stimuli were recorded in a professional studio by four volunteers, two men and two women, native speakers of Brazilian Portuguese, aged 25-38 years old. After the recordings, each stimulus was edited in *Praat* (BOERSMA; WEENINK, 2012), so we could make sure they all had the same duration (approximately 0.6 seconds). During the task, participants randomly heard a sequence of three words and had to decide whether the first vowel of each word was identical in the first two words, in the last two words, or in the three words. All participants took the test individually in the Language Laboratory at the Federal University of Rio Grande do Sul, and it took them about an hour in average to complete the task. The results were interpreted based on the *Perceptual Assimilation Model-L2* (BEST; TYLER, 2007) and with the support of the literature in Phonetics and Phonology (ALBANO, 2001, 2004; KATTÁN-IBARRA; POUNTAIN, 2003; CRISTÓFARO-SILVA, 2009; REAL ACADEMIA ESPAÑOLA, 2011). Our findings suggest that the Argentine Spanish participants are able to discriminate the front close-mid vowel [e] from the front open-mid vowel [ɛ] [$t(10) = -2.316$, $p = 0.043$], indicating a possible formation of two different phonological categories. However, the same participants do not seem to be able to establish functional contrast between the back close-mid vowel [o] and the back open-mid vowel [ɔ] [$t(10) = 0.464$, $p = 0.653$], indicating that such vocalic elements possibly overlap in their phonological system.

Keywords: Argentine Spanish speakers; auditory perception; vocalic contrast in Portuguese.

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BILINGUALISM AS A POTENTIAL SOURCE OF COGNITIVE RESERVE

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A growing body of evidence suggests that bilingualism can act as a source of cognitive reserve. However, a poor control of possible confounding variables is possibly the reason why there still have been some discrepancies in the literature. Therefore, we aimed at examining the potential of bilingualism as a source of cognitive reserve for younger and older participants while controlling socioeconomic, educational and functionality levels. We tested 136 younger (40-55 years old) and older (60-71 years old) participants on the ANT task, verbal fluency tasks and N-back task. Half of the participants were bilinguals (*Hunsrückisch*-Portuguese) and half were monolinguals (Portuguese). Younger bilinguals and monolinguals performed equivalently, but older bilinguals were faster than older monolinguals in the N-back test. Moreover, the magnitude of the aging effect in the ANT test and in the phonological fluency task was smaller for bilinguals. Thus, our results suggest that bilingualism may contribute to the formation of cognitive reserve.

Keywords: Bilingualism; Attentional networks; Lexical access; Working memory; Aging

WORD ORDER COMPREHENSION IN BRAZILIAN INFANTS

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An experiment with 20 Brazilian children from 13 to 27 months old (mean age 20.14 months, 8 boys) was conducted in order to investigate young children's comprehension of Brazilian Portuguese (BP) canonical word order through the Intermodal Preferential Looking Paradigm (SPELKE, 1979). The test was adapted from another experiment by Hirsh-Pasek & Golinkoff (1996) designed to investigate word order comprehension in children acquiring English. In the authors' test, children aged 16 to 21 months were presented two simultaneous videos, displaying scenes of two familiar characters performing the same action, changing only the roles of agent and patient in each video screen; for instance, while the left screen displayed a video of Cookie Monster tickling Big Bird, the right screen displayed a video of Big Bird tickling Cookie Monster. The linguistic stimulus that accompanied each action referred to only one of the screens, as in "Cookie Monster is tickling Big Bird". The average looking time for each screen was measured to see if there was any preference for the screen matching the linguistic stimulus for four different actions. The overall results showed a preference for the matching screen, making it possible to conclude that American children comprehend English canonical word order and correlate this information with the appropriate semantic context.

The experiment proposed in the present work follows the same basic outline of Hirsh-Pasek & Golinkoff's (op. cit.); the major differences were: 1) the test was run in a daycare institution instead of a laboratory, therefore resembling a more portable version of the method (Portable Intermodal Preferential Looking, as described by Naigles & Tovar (2012)); 2) we tested a wider age group, since it was not possible to attain a significant number of children in the age group covered by Hirsh-Pasek & Golinkoff; and 3) we did not teach or access the knowledge of the verbs used in the test videos by children. The goal of this adaptation was to investigate if Brazilian children would show comprehension of word order through its correlation with semantic information. If Brazilian children performed well in the test, then we would be contributing to verify a wider hypothesis that as soon as their first birthday children can comprehend some basic syntactic informations about their native language (although, of course, it would also be necessary to test other languages, especially ones that do not have SVO canonical word order, such as German and Japanese).

The results do not show a significant preference for the matching screen for any of the four actions, although the older group (21 to 27 months, 9 children) and the girls showed a slightly better performance. Therefore, we cannot corroborate the hypothesis that young children acquiring BP can correlate structural information with the semantic roles of characters in the context. It is possible, however, that these results are due to the fact that most children did not know some or all of the verbs presented in the test, what is predicted by the fact that some more familiar verbs showed better results than others. This shows that, on the proposed test, knowledge of the verb meaning is necessary to the comprehension of syntactic structure for young children.

		pentear		çoçar		pintar		beijar		mean		p - value
		match	no-match	match	no-match	match	no-match	match	no-match	match	no-match	
sex	girls (n = 12)	2.62	2.95	1.47	3.09	2.24	2.52	3.59	1.63	2.48	2.59	p = 0,5
	boys (n = 8)	3.25	1.98	1.97	2.22	1.58	2.98	2.37	3.35	2.29	2.63	p = 0,7
age (mo.)	13 to 20 (n = 11)	2.90	2.24	1.07	2.95	1.53	2.92	2.91	2.52	2.10	2.56	p = 0,9
	21 to 27 (n = 9)	2.84	2.96	2.41	2.49	2.53	2.44	3.34	2.07	2.78	2.49	p = 0,3

Table 1 – mean visual fixation time (in seconds) by sex, age and stimulus (*pentear* (comb), *çoçar* (scratch), *pintar* (paint) and *beijar* (kiss)) to the "matching" and "nonmatching" screen during the test trials. The p-values refer to the differences (on paired t-tests) between match and no-match for the general data.

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INDIVIDUAL DIFFERENCES IN INFERENCE GENERATION DURING EXPOSITORY TEXT COMPREHENSION: WORKING MEMORY AND PRIOR KNOWLEDGE

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Expository texts are an important tool for learning. Its purpose consists of informing about new concepts, generic or abstract realities, and providing important technical information (Vidal-Abarca et al., 2002). Reinstatement inferences are an important kind of inferences generated while reading an expository text, specifically when the reader reactivates information presented previously in the text, in order to maintain sufficient causal justification for the statement that it's reading (van den Broek, 1994; van den Broek, Virtue, Everson, Tzeng, & Sung, 2002). Working memory refers to the mechanisms and processes involved in the control, regulation and active execution of complex cognitive activities, and the active maintenance of relevant information (Shah & Miyake, 1999). Cognitive processes use readers' prior knowledge to interpret linguistic stimuli while reading. Available prior knowledge about the language and about the world facilitates not only comprehension of the explicit information in the text, but also the generation of inferences about implicit information (McNamara & Kintsch, 1996). The aim of this study is to examine the relationship between the generation of reinstatement inferences and working memory, and the generation of reinstatement inferences and prior knowledge, both in expository texts. *Method.* Sample. 83 undergraduate students of both genders (20.48 % male) volunteered to participate in the study. Their mean age was 21.67 ($SD = 5.62$). *Materials and procedure.* Two texts - one about climate change and other about mars exploration- were presented. Before reading the texts a questionnaire about climate change and astronomy knowledge were completed by the participants. After reading each text a questionnaire about reinstatement inferences was presented. These questions were based on the sentences that required, from the reader, reinstatement explanations of concepts. *Results.* The correlation analysis showed that working memory task and prior knowledge questionnaires correlate with reinstatement inferences questionnaires ($p < .05$). The path analysis indicates that working memory has an important effect on prior knowledge ($\beta = .65, p < .001$), and prior knowledge is important to reinstatement inference making ($\beta = .61, p < .001$). Also working memory has an indirect effect on reinstatement inferences ($\beta = .40$). *Discussion.* These results could indicate that the capacity of reactivate information previously presented in the text, in order to maintain sufficient causal justification for the statement that he or she is reading, could be supported by working memory resources and by the reader's previous knowledge.

Key words: Inference generation ; Expository text ; Working memory ; Prior knowledge

DEVELOPMENT OF PERSON DISTINCTIONS IN THE POINTING OF BIMODAL BILINGUAL CHILDREN

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We report our finding on the development of person distinctions in pointing by Bimodal Bilingual (Bibi) children. Pointing carries pronominal functions in sign languages (Friedman, 1975). However, how different persons are realized is still under discussion. Some researchers argue that the full range of 1st, 2nd and 3rd person information is available (Barberà 2012, Alibašić 2003; Alibašić and Wilbur 2006). However, some other researchers argue that there is no distinction between 2nd and 3rd persons. In other words, 1st and non-1st is the crucial distinction for the realization of pronouns in the form of pointing (Meier, 1990; Lillo-Martin & Meier 2011). We tested these two theories against child language data. We examined how person distinctions develop in the pointing behavior of children in sign (interlocutors Deaf signers) and in speech (interlocutors hearing bilinguals) target sessions. Our report compares aspects of pointing at different ages from two children in US who are American Sign Language (ASL) / English bilingual and one child from Brazil who is Brazilian Sign Language (Libras) / Brazilian Portuguese Bilingual. The ages of the children and the number of pointing signs annotated are given in Table 1:

Child	Age	Target language	# Child IX	# Adult IX
BEN (US)	2;00-2;06	ASL	182	233
	2;00-2;06	English	156	103
TOM (US)	1;11-2;06	ASL	47	--
	2;00-2;06	English	31	--
EDU (BR)	2;02-2;07	Libras	30	139
	2;00-2;09	BP	26	54

Table 1

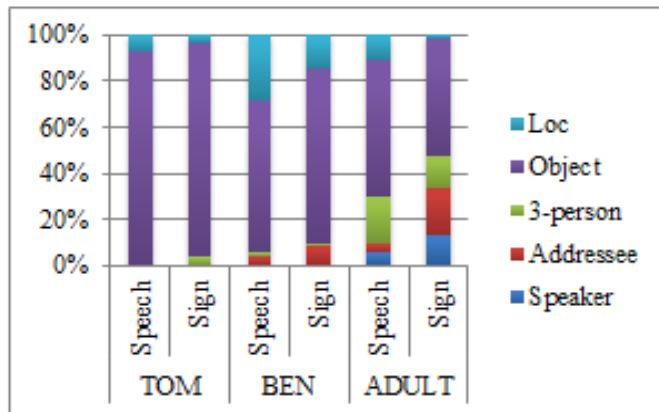


Figure 1

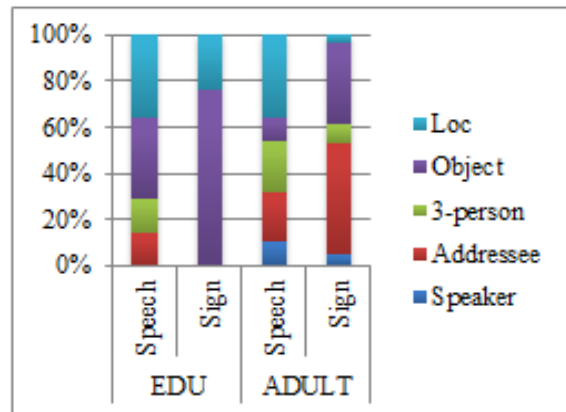


Figure 2

As Figures 1 and 2 show, our finding is in line with the 1st vs. non-1st distinction proposal for the classification of persons since the 1st person is not observed in any of the children while non-1st persons (i.e. 2nd and 3rd) are observed. Adult input cannot explain the pattern as adults are observed to use 1st person forms as we see in the figures. Also, one can't explain the pattern in terms of an overall late development of first person pronouns in child language since independent results from the development of person distinctions in the speech of our children show that 1st person develops at the same time with non-1st persons. Therefore, we can make the conclusion that although pointing to self looks like an iconic gesture which seems to be potentially easy for the child to do, it still requires the learning of the linguistic distinction for the 1st person explaining its later development than non-1st persons.

Keywords: Bimodal Bilingualism; pointing; pronominals

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**PHONEME DISCRIMINATION IN LIBRAS/PORTUGUESE AND ASL/ENGLISH
BY BIMODAL BILINGUAL CHILDREN AND DEAF CHILD USERS OF
COCHLEAR IMPLANTS**

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Studies of children with cochlear implants from hearing families (CIH) have consistently found that they perform below their hearing peers for speech perception. On phonemic discrimination tasks, CIHs have been found to exhibit shallower discrimination functions than hearing children (Geizen 2011). CIHs are typically discouraged from signing and have at most limited exposure to sign language. In contrast, a small number of cochlear implant users are children from Deaf, signing families (CID) who receive unrestricted access to a natural sign language from birth. The present study compares the performance of these two groups of CI users on phonemic discrimination tasks in their signed and spoken languages (Brazilian Portuguese (BP) and Brazilian Sign Language (Libras) for Brazilian participants, and English, and American Sign Language (ASL) for American participants). Parallel data from hearing children and adults raised by Deaf, signing families (Kodas and Codas, respectively) were also analyzed. General findings across the two countries reveal similar performance for Brazilian and American Koda participants on the spoken language task. Correct discrimination increased as participant age increased, with children from 6;0 onward performing at adult-like levels. American and Brazilian CIDs scored within the same range as Kodas in their age group. The Brazilian CIH children, in contrast, struggled with the task, with the one the child who completed the task displaying lower accuracy (27.5%) than the CID participant (87.5%). Results for the signed discrimination task were similar to those for the spoken discrimination task. Accuracy increased with age for the Koda participants, and the CID children's scores fell within the ranges for kodas of their age. The CIH children performed with significantly lower accuracy than the other groups in the sign discrimination task, though they were more accurate on this task than on the spoken discrimination task, suggesting a CIH preference for the visual channel, despite their limited sign language exposure. Our findings are similar to those of Hassanzadeh (2012), who reported that CID children have an advantage over CIH children in speech perception, resulting from early sign language exposure for the former group. In concert with this and other recent studies comparing linguistic abilities of cochlear implanted children with and without early sign language exposure (Giezen et al. 2014; Rinaldi and Casselli 2014; Seal et al. 2011), our data so far indicate that bimodal bilingual acquisition, or simultaneous acquisition of one spoken language and one sign language (for bimodal bilinguals who have access to a spoken language either naturally or through an implant), facilitates rather than hinders the development of phonemic discrimination ability in ASL/Libras or in English/PB.

Keywords: Deaf; bimodal bilingual; phonological awareness; cochlear implant

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TEXT COMPREHENSION: THE PRESENTATION OF TEXTS IN DIFFERENT MODALITIES AND ITS RELATION TO MEMORY

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This research sought to investigate the presentation of texts in different modalities (oral and written) on comprehension in a foreign language and its relation to memory. More specifically, we sought to examine, in psycholinguistics perspective, the text comprehension for students of intermediate level of proficiency in Spanish as a foreign language in different modalities of presentation (oral and written) and its relationship to long-term and work memory. The research questions were: Which modality of text presentation (oral / written) produces greater impact on reading comprehension for learners of Spanish as a foreign language at the intermediate level? What type of text structure will be recovered in greater numbers and acuity at different intervals of time after your presentation? Is there a relationship between the processing capacity of working memory (MT) and the recovery of propositions of the text? The study included two groups of Spanish students from two federal universities in the southern state of Rio Grande do Sul, with eight students in each group. Each had an intermediate level of Spanish proficiency (measured through a proficiency test of Instituto Cervantes) and all were in their fifth semester of instruction. The study took place in three stages. In the first stage, one group read a Spanish text, while the other group only listened to this same text. Both groups were then instructed to write everything they remembered after reading or listening to this text. This same procedure was repeated in the second and third stage of the study. The texts produced by the participants were divided into propositions, which were compared with the propositions of the original text. After analyzing the data, two participants in each group were selected for a test of MT. Among the results, it is emphasized that there was no significant difference ($p = 0.1$) in comprehension and recovering the contents of the text considering the modalities of presentation; the macropropositions resumed outnumber the micropropositions the three testings, but this difference was not significant; there was a significant correlation between the ability of MT and retrieving text content ($r = 0.991$, $p = 0.05$). The implementation of this research sought to contribute to the research in the interface of memory and comprehension in the study of a foreign language.

Keywords: Text comprehension in L2; Memory; Modalities of presentation;

NULL AND RESUMPTIVE PRONOUNS IN LEFT-DISLOCATED STRUCTURES IN BP: ADULTS RESPONSES IN A PICTURE MATCHING TASK

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The use of resumptive pronouns is well attested in Brazilian Portuguese (BP). In object positions, preference for an overt nominative pronoun or a null category seems to characterize levels of formality, distinguishing oral and written modalities. The processing of a resumptive pronoun, be it overt or null, is directly related to the reactivation of an antecedent. In object left dislocated structures, overt or null pronouns may be present (*O menino, a mãe abraçou ___/ele* – The boy, his mother holded ___/him/*O menino, a mãe cuidou ___/dele* – The boy, his mother took care ___/of him). In the experiment reported, Brazilian undergraduated students were asked to decide whether a sentence presented on a computer screen matched or did not match a following presented picture. Our main objective is to verify the complexity of the task as a function of the type of resumptive pronoun used and the type of picture presented as support for the planning of similar comprehension tasks for children. Indirect and direct transitive verbs were used as well as overt or null pronouns. In indirect object sentences, overt pronouns followed the preposition “*de*”(of) (see example above). Four types of pictures were presented: (1) a matched picture displaying two characters involved in the action depicted by the verb; (2) a non-matched picture displaying the reverse agent-patient performance of the action; (3) a matched picture displaying three characters, two of which were involved in the action depicted by the verb while the third character observed; and (4) a non-matched picture with three characters in which the non-mentioned character is the patient. Our hypothesis was that three characters pictures could add processing cost, especially for sentences with overt pronouns, which could be interpreted as deitic pronouns, making more plausible the search for a possible different referent in the contextual situation. Two dependent variables were considered: number of correct responses and responses reaction time. The independent variables were *type of object* (left-dislocated sentences with direct or indirect objects); *type of pronoun* (null or overt); *type of picture* (1; 2; 3; 4). Thirty-eight participants took part in the experiment. As for the number of correct responses, results show that Pict.2 is the hardest one and that more correct responses are found with overt pronouns. As for responses reaction time, an ANOVA also reveals that overt pronouns lead to shorter reaction times. An interaction between *type of pronoun* and *type of picture* shows that Pict. 4 leads to higher response times for both null and overt pronouns, as partially predicted by our hypothesis. These results might also shed light on a discussion about the type of structures involved; topicalization or left-dislocated structures. An implicit facilitation overt pronouns induce (in terms of correct responses) and the non-distinct results concerning null or overt pronouns in relation to difficulties in analysing pictures of type 4 suggest that the sentences presented have been analysed as left-dislocated structures. These results are also relevant for the investigation of the acquisition of resumptive pronouns in BP. Although it has been shown that toddlers are sensitive to non-canonical word-orders (Dautriche et al., 2014), it has been claimed that children, in BP, concerning topicalization, would resort to movement-gap constructions in production at first (before 3 years of age) (Grolla, 2005). It has also been shown, nevertheless, that resumptive pronouns may add processing cost in comprehension for older children (5 years of age) (Miranda, 2008). Being so, the results with adults presented here should be taken into account when planning comprehension tests for addressing children’s mastery of resumptive pronouns in left-dislocated structures (Rodrigues & Corrêa, 2013).

Keywords: resumptive pronouns; left dislocated structures; Brazilian Portuguese.

AGREEMENT PROCESSING IN BRAZILIAN PORTUGUESE

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Natural languages allow encoding quantities providing an inventory of nouns for exact numerosities, words for quantifying sets of elements and explicit symbols for establishing the singular/plural contrast. In the case of Brazilian Portuguese (BP), previous studies in language acquisition suggest that early perception of morphophonological distinctions in elements of the category D (Determiner) would be crucial for the identification of *number* as formal feature (Ferrari Neto, 2003, 2008). Experimental results from children aged from 18 to 28 months are compatible with the view that agreement information within the DP would be crucial in this process. However, BP exhibits variable patterns of morphological agreement that have been widely discussed, beginning with the pioneer study of Lemle & Naro (1977). Both in the nominal domain and in the subject-verb relationship, there are two different rules in the realization of plural agreement: (i) redundant marking in all the elements of the DP and in the verbal suffix; (ii) non-redundant agreement, in which the plural marking is carried by one of the DP items and can be omitted in the remaining items. According to these rules, BP licenses sentences such as: *Sumiram*-plural verbal suffix *as*-plural D *pedras*-plural nominal suffix (= *The stones are gone*) vs. *Sumiu*-singular *as*-plural D *pedra*-singular (= *The stones are gone*). Ferrari Neto (2008) investigated the comprehension of number information in the DP in the standard (number marking in all agreeing elements) and in the non-standard dialect (number marking only in D) with 2-year-olds BP speakers. These two conditions were contrasted with non-grammatical plural DPs or singular DPs with a false plural affix and infixes. The results suggest that children identify number information in D; there was no difference between their performance in the standard and in the non-standard condition, whereas children distinguish these conditions from the ungrammatical or false plural ones. Results obtained from children acquiring European Portuguese (EP), in turn, suggest that in this language standard and non-standard number marking are not treated equally: children in EP preferred the standard form (Castro, 2007). With the exception of these studies – focused on the acquisition of number features–, variable agreement in BP has been mainly investigated in the context of sociolinguistic researches. A set of favorable/unfavorable variables has been raised from corpora analysis (Almeida, 1997; Graciosa, 1991; Vieira, 1995): phonetics strength, discursive parallelism, position and distance between subject-verb, are some of the factors that seem to determine the implementation of the two rules. Sociolinguistic variables such as origin (rural/urban), educational level, gender and age, have also been identified as being relevant. This paper focuses on adult processing of variable agreement in BP in a psycholinguistic point of view. The results of a self-paced listening experiment conducted with BP speakers are reported. During the test, participants listened to a sequence of two sentences in which the relevant plural referent presented in the first sentence was retrieved by an anaphoric pronoun in the second one. Example: *No sítio da Ana, os esquilo/s desceu/eram da árvore. Eles/Ele recolheu/eram nozes no quintal* (= *In Ana's country house, the squirrels went down the tree. They gathered nuts in the yard*). The independent variables were *agreement* (standard –“*os esquilos*”– versus non-standard –“*os esquilo*”) and *congruency* (congruent pronominal retrieval (*eles*) versus incongruent retrieval (*ele*)). The dependent variables were *listening time* of each segment, *reaction time* and *number of target responses* in the comprehension question presented after the listening (Ex. *Os esquilos procuravam nozes?* = *Were the squirrels looking for nuts?*). The results showed longer listening times in the *non-standard agreement* condition and significantly more errors in the condition *non-standard agreement with incongruent retrieval*. These preliminary results suggest that – even

when the non-standard agreement rule is well accepted for higher educational level speakers – the absence of the morphologically repeated marks may be more demanding in terms of linguistic processing when compared with the redundant standard pattern.

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THE CAUSATIVE ALTERNATION IN THE MAXAKALÍ LANGUAGE

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The aim of this study was to investigate the processing of the causative alternation in the Brazilian indigenous language Maxakalí (Macro Je stock). For that purpose we applied two psycholinguistic experiments of speeded acceptability judgment, the first with visual input and the second with auditory input, both performed with native speakers of Maxakalí. The experiments presented four conditions, namely, TA (transitive with animated subject), TI (transitive with inanimate subject), IN (unaccusative) and NG (inergative). It is important to highlight that the unaccusative clauses of the language are divided into two groups (Campos, 2009): class I and class II. These sentence classes are coded in different ways, yielding different results in the experiments. The acceptability rates and yes/no response times were measured. According to the experimental results, analyzed using statistical techniques, the unaccusative sentences have higher processing costs, compared to transitive and inergative sentences. This more costly linguistic processing behavior is the result of the more complex syntactic structure of unaccusative clauses, for their internal argument moves from its base position to the external argument position to check Case. Through this study, we tried to demonstrate that the syntax has a psychological reality for speakers of Maxakalí language, namely, more complex syntactic structures generally have a higher cost of linguistic processing, as is the case of unaccusative sentences.

Examples of Experimental Sentences

TA- transitive with animated subject	<i>Tu te hām-yĩkox xõn</i> he ¹ ERG door open “He opened the door”
TI- transitive with inanimate subject	<i>Ãmuuh te hām-yĩkox xõn</i> wind ERG door open “The wind opened the door”
IN class I- class I unaccusative	<i>Ūkutut ã-pakut</i> Old man 3-sick “The old man is sick”
IN class II- class II unaccusative	<i>Hām-yĩkox yã y xõn</i> door ² ANTCAUS abrir “The door opened”
NG- inergative	<i>Kakxop potaha</i> child cry “The child cried”

Keywords: Maxakalí; Causative Alternation; Psycholinguistic Experiment;

¹ Ergative

² Anti causative

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THE USE OF PROSODY CUES IN THE SENTENCE STRUCTURE: A STUDY ABOUT TOPIC AND SUBJECT STRUCTURES IN BRAZILIAN PORTUGUESE

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In this study, we investigated if prosody cues can influence listeners when choosing the syntactic structure (Carlson et al 2001; Clifton Jr. et al 2002; Frazier et al 2003). In order to do this, we recorded 12 trials in 4 conditions, as shown in the examples below:

- A) Long Subject (LS): A carta de amor foi guardada no diário secreto.
 (The love letter was put away in the secret diary.)
- B) Long Topic (LT): A carta de amor, Lia guardou no diário secreto.
 (The love letter, Lia put away in the secret diary.)
- C) Short Subject (SS): A carta foi guardada no diário secreto.
 (The letter was put away in the secret diary.)
- D) Short Topic (ST): A carta, Lia guardou no diário secreto.
 (The letter, Lia put away in the secret diary.)

After the recording, the trials were cut after the subject or the topic (Callou et al 1993), according to each sentences' condition (see the underlined fragments above). The pairs of fragments ("A" and "B"; "C" and "D") are only different in the prosody utterance, as shown in the figures below:

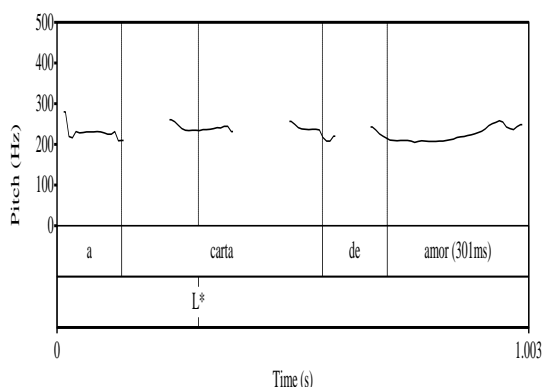


Figure 1: The fragment "A carta de amor" in the Subject Long condition.

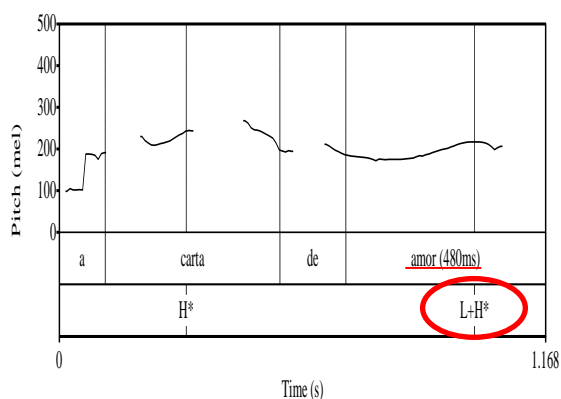


Figure 2: The fragment "A carta de amor" in the Topic Long condition.

We then applied a sentence completion task (Kjelgaard & Speer, 1999) to 24 Brazilian Portuguese native speakers, all of whom are college undergraduates. After hearing the fragment, the listeners completed the sentence with the first idea that came to mind. We measured the reaction time (RT) between the end of the fragment and the beginning of the listeners' completion. Besides the measurement of the RT, we analyzed the syntactic structure present in the listeners' completion for each trial. We found the following RT averages by condition: Long Topic 3057ms; Long Subject 2709ms; Short Topic 2514ms and Short Subject 2474ms. The RTs were normalized and then underwent a factorial anova. There was a significant difference among the RT averages by condition $F(3,274)=18,514$ $p<0,01$. In the post hoc test (Bonferroni), the Long Topic (LT) condition showed a significant difference of

the others conditions: LT vs. LS $F(3,271)= 17,237$ $p=0,009$; LT vs. ST $F(3,271)= 17,237$ $p<0,01$ and LT vs. SS $F(3,271)= 17,237$ $p<0,01$. These results point to a prosody effect in the work memory of the listeners. In analyzing the listeners' answers however, there was a preference for the subject structures even in the Topic prosody condition (LT or ST). We believe that this preference was influenced by the formality of the task and by the education level of the listeners, being that the topic structure is considered less formal in Portuguese.

Keywords: prosody; sentence processing; sentence comprehension.

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DOES ACCEPTABILITY JUDGMENT PERFORMANCE DISTINGUISH BETWEEN LOW AND HIGH L2 PROFICIENCY?

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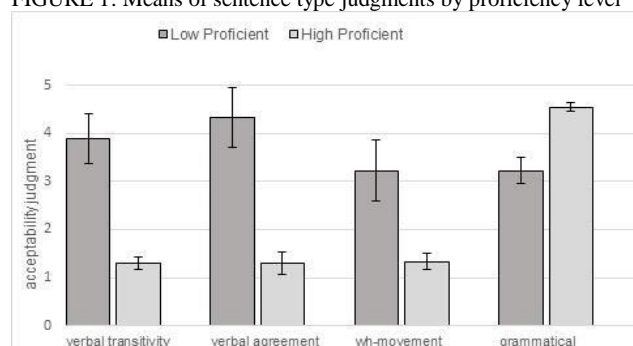
1. Introduction - Several studies have suggested the relation between vocabulary knowledge and reading, writing, listening and speaking abilities in bilinguals (Staehr, 2008, Zimmerman, 2004, Milton et al. 2010), and also between vocabulary level and the CEFR - Common European Framework of Reference for Languages (Milton, 2010). In this study, we investigated the extent of overlap between L2 proficiency level and performance in an L2 acceptability judgment (AJ) tasks. The purpose is to assess whether the latter type of task is a valid psychometric measure of L2 proficiency.

2. Methods - Thirty Brazilian Portuguese-English bilinguals participated in the experiment (age mean=25.6). An independent measure of proficiency in English L2 was obtained by administration of the Vocabulary Levels Test (VLT - Nation, 1990), a 5-band diagnosis of vocabulary size, and the Oxford Placement Test (OPT), a 60-item test that features knowledge of grammatical structure. The target sentences of the AJ task were composed of 16 ungrammatical sentences and 40 grammatical sentences. Eight of the ungrammatical sentences had argument structure realization violations, namely forged causatives with unergative verbs (1), and 8 ungrammatical sentences displaying morphosyntactic violations - subject/verb agreement (2), and WH-movement (3). To provide contrasts, we included grammatical sentences with manner-of-motion verbs in causative constructions, so-called induced movement alternation (4) (Levin, 1993), and change-of-state verbs (5) (Levin & Rappaport Hovav, 1995):

- (1) * The man laughed the children in the party.
- (2) * The girl give the cats milk twice a day.
- (3) * Who did Jane call her friend after she saw?
- (4) The instructor ran the boys around the park.
- (5) The girls melted the cheese in the bowl.

3. Results - There was a statistically significant correlation between the proficiency measures of VLT with OPT ($r = .843, p < .05$), and with acceptability judgments across the three types of violations and the grammatical sentences: $r_{(1)} = -.799, r_{(2)} = -.791, r_{(3)} = -.807, r_{(4)} = .772$ ($p < .05$).

FIGURE 1: Means of sentence type judgments by proficiency level



The judgment means by low- and high-proficient participants were significantly different across the three types of ungrammatical sentences, as well as in the grammatical sentences. It suggests that the participants' proficiency level correlates with their performance in the judgment task.

TABLE 1: Correlation between VLT/OPT across sentence types

	Vt	Va	Wh	G	Vlt
V. Transitivity					
V. Agreement	.940*				
Wh-Movement	.874*	.880*			
Grammatical	-.869*	-.902*	-.815*		
VLT	-.799*	-.791*	-.807*	.772*	
OPT	-.779*	-.720*	-.801*	.624*	.843*

These results converge with predictions about grammaticality status from the theory of grammar and suggests that the accuracy of sentence judgments were sensitive to the levels of proficiency based on VLT scores. Moreover, our results attest to the viability of employment of AJ as measures of L2 proficiency with certain L2 structures.

AN ERP STUDY OF THE KARAJA DISTRIBUTIVE *SOHOJI-SOHOJI*

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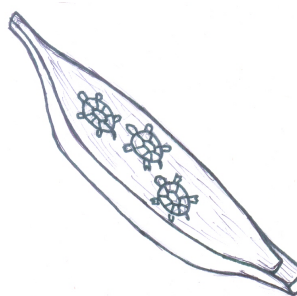
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The aim of this poster is to present some results from an EEG experiment to be run in January 2015 at São Félix do Araguaia (MT, Brazil) that intends to deepen our understanding of the semantic processing of the nominal distributive operator *sohoji-sohoji* present in the Karajá language (Macro-Jê stock). *Sohoji-sohoji* has also an interesting morphology, since it is formed by the reduplication of the numeral one (*sohoji*). According to Gil (2014), numeral reduplication is quite common in a cross-linguistic perspective (33% - WAIL map 54A). However, few Brazilian languages are discussed in this overview paper. The Karajá language, for example, was not considered nor Karitiana, another Brazilian language from the Tupi stock that has an interesting case of adverbial distributive numeral reduplication, c.f. Muller (2012). We can conclude, then, that the percentage of languages that exhibit this phenomena can be larger than what is currently known.

To observe the semantic processing of *sohoji-sohoji* we designed a picture matching EEG test (E-prime) that tries to answer the following question: Are the exhaustive, collective and partial distributive readings allowed by this operator? 48 experimental sentences were distributed by six conditions: (i) distributive; (ii) non-exhaustive; (iii) extra-subject; (iv) collective; (v) partial-distributive; and (vi) singleness. All the items were randomized in a latin square design. 48 distractors were also included in this experiment. The average RTs and the N400 signals will be analyzed within subjects. We can see bellow an example of experimental sentence and a picture scenario.

- (01) kotuni sohoji-sohoji hãwo-roki rÿireri
turtle one-one canoe-PosP COP
“Each turtle is in the canoe”



Fig(1): the collective scenario condition

Following an off-line pilot experiment realized in June 2014, we expect that the distributive condition will be processed and accepted significantly faster by the participants as a valid scenario than the extra-subject condition. On the other hand, we also expect that the singleness condition will not be considered since the distributive needs more than one relation (R) between subjects and events, neither the collective and partial-distributive scenarios will be allowed by the *sohoji-sohoji* semantic denotation.

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THE EFFECT OF EDUCATIONAL LEVEL ON SEMANTIC PROCESSING

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The aging population is growing each day, therefore it is extremely important to study the cognitive aging process. Current research appears to be taking into consideration the participants' educational level (EL). Thus, when it comes to studying language, the participants' EL may be a variable to influence task performance. The aim of our study was to investigate the impact of EL on semantic processing in healthy aging. Thirty five elderly participants took part of this study: 15 participants with low educational level (LEL), and 20 participants with high educational level (HEL), mean age of 69,33 and mean of 4,27 years of education. The HEL group had mean age of 67,50, and mean of 15,5 years of education. All participants underwent a cognitive assessment (MEEM), depression assessment (GDS), a questionnaire on reading and writing habits, and a socioeconomic questionnaire (SES). The semantic task consisted of naming 60 line drawings counterbalanced between living and non living, and less and more frequent items. The types of incorrect answers made by the participants were analyzed, together with their total naming score. The results showed that HEL participants had higher writing habits than the LEL group ($p=,009$), but both healthy groups did not differ ($p>0,05$) in reading habits and SES. HEL and LEL showed no statistical difference ($p>0,05$) in the number of incorrect answers, and their types of errors were similar. When comparing living and non living stimuli, the two groups of participants made more errors in the living items. Results suggest that the EL may not influence the participants' naming ability when their SES and reading habits are controlled, as already verified by other studies. Types of errors analyses may bring evidence to corroborate the hierarchical model, the spreading activation model of semantic organization and processing, while the analysis of living versus non living items may be explained by the sensory functional theory.

Keywords: semantic processing; healthy aging; educational level;

REVISITING THE BILINGUAL ADVANTAGE WITH THE ANT TASK

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Several studies on bilingualism suggest it can boost executive functions due to code-switching, which would enhance inhibitory and attentional control (e.g. Bialystok et al., 2004, 2005; Costa et al., 2008). However, the so-called bilingual advantage is not evident in some studies, mainly when demographic factors are controlled more strictly (Morton & Harper, 2007), or when attentional and inhibitory control are analyzed separately (Bialystok et al., 2009). This study investigates possible differences between bilinguals and monolinguals regarding three attentional networks (alerting, orienting and executive control). The participants were tested with the Attentional Network Task (ANT) (Fan et al., 2002), a non-verbal cognitive task which allows drawing a set of interesting predictions in terms of the potential conditions that may be affected by bilingualism. There were 40 highly-educated middle-aged businesspeople (20 bilinguals – mean age 48.1 – and 20 monolinguals – mean age 47.2), from cities in the south of Brazil. This specific professional group was chosen considering the strong cognitive demands of their profession, having to solve problems by making administrative and financial decisions that involve a lot of responsibility. Thus, their professional activity could strengthen their inhibitory control and problem solving skills, which could compete with the cognitive advantages brought out by bilingualism. This particular age group was chosen because no previous studies had ever investigated such population in these regards. Regarding statistics, “RT” and level of “Accuracy” were taken as dependent variables, and “Language Group” (monolingual/bilingual) was taken as an independent variable. After contrasting the normality hypothesis for all the pairs of samples with the Shapiro–Wilk and the Kolmogorov-Smirnov tests, and using the Levene test to see the homogeneity of variance, some variables were measured by Mann-Whitney, while others were measured by Independent Samples t-tests. We used a p-value below 0.05 as a cut-off point for all the statistical tests. In line with most of the studies meta-analyzed by Hilchey and Klein (2011), no significant statistical differences were found between the groups in any of the attentional networks. The discussion suggests a possible competition among the variables level of education, profession, and bilingualism, which adds evidence for the argument on the absence of coherent proof for the bilingual advantage (2013).

Keywords: bilingual advantage; attentional networks; attentional control; ANT

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FILLED GAP EFFECTS AND SELECTIVE FALLIBILITY IN BRAZILIAN PORTUGUESE SENTENCE PROCESSING

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The Filled Gap Effect (FGE) has been found in many different languages, since the findings of CRAIN & FODOR (1985) and from STOWE (1986). In Brazilian Portuguese, MAIA (2014) presents results of eye-tracker and self-paced reading experiments in which he analyzed the process of Wh-Questions in semantically plausible and implausible sentences. In sentences like (a), we can see the phrase “a tese/the thesis” filling the gap after the verb “escreveu/wrote”. In such cases, both the average reading times (SPR) and total fixation duration (eye-tracking) obtained during the reading of the phrase “a tese” lasted longer than the same phrase in sentences like (b) in which the gap after the verb “escreveu/wrote” is not filled. The same effect happens in sentences with implausible names filling such position, for example the sentence in (c).

- (a) [Que livro]_i o professor escreveu a tese sem ler t_i ontem de manhã?
Which book the professor wrote the thesis without read yesterday morning?
- (b) [Que livro]_i o professor escreveu t_i sem ler a tese ontem de manhã?
Which book the professor wrote without read the thesis yesterday morning?
- (c) [Que professor]_i o aluno escreveu a tese sem consultar t_i ontem de manhã?
Which professor the student wrote the thesis without consult yesterday morning?

CLIFTON & FRAZIER (1989) analyzed the FGE as an epiphenomenon of a more comprehensive principle of sentence processing, the Active Filler Principle, part of the economy strategies of the Garden Path Theory. In the present study, we sought to find experimental evidence about the psychological reality of the FGE but this time comparing transitive verbs, like sentences in (d) and (e), and comparing intransitive ones, like sentences in (f) and (g). Moreover, the present study questions if the parser, which is guided by the Active Filler Principle, would incur in misanalysis motivated by a grammatical illusion, analyzing an adjunct DP as an argument DP.

- (d) Que jogo / o idoso / gravou / **quinta** / sem ouvir / em casa / antes?
Which game / the elder / recorded / **Thursday** / without listen / at home / before?
- (e) Que livro / o escritor / lançou / **aqui** / sem rever / domingo / de manhã?
Which book / the writer / released / **here** / without review / Sunday / in the morning?
- (f) Que jogo / o idoso / morreu / **quinta** / sem ouvir / em casa / antes?
Which game / the elder / died / **Thursday** / without listen / at home / before?
- (g) Que livro / o escritor / veio / **aqui** / sem rever / domingo / de manhã?
Which book / the writer / came / **here** / without review / Sunday / in the morning?

Applying a self-paced reading experiment in 24 subjects, we investigated the preference of the parser for an object argument in sentences in which the adjunct was close (or not) to the verb (transitive or intransitive). We found out that there is the FGE in Brazilian Portuguese only after transitive verbs, therefore showing a rapid access to the verb subcategorization grid. Furthermore, this effect only occurs when a name functioning as an adverb is filling the gap, not occurring with real adverbs. Thus, the parser showed a quick access to the grammatical category of the syntactic constituent, indicating selective fallibility.

Key-words: Filled Gap Effect; Good Enough Hypothesis; Grammatical illusion; Sentence Processing; Transitivity effects; WH-constructions.

THE ROLE OF THE ORDER OF REFERENTIALLY DEPENDENT ELEMENTS ON COREFERENCE RESOLUTION IN BRAZILIAN PORTUGUESE

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This research aims to contribute with empirical data to the generative research in aspects of coreference and pronominal resolution in Brazilian Portuguese. This is a research in the field of experimental syntax, and it focuses on the role that the order of referential dependent elements can play in coreference resolution, being that done either inside the scope of the sentence (strict syntactic coreference) or outside of it (a field that would mingle with pragmatics of discourse).

We report a total of four experiments, three online and one offline. The online ones are two self-paced reading experiments and an eyetracking experiment. The offline experiment is an elicited production experiment, done using paper forms.

In the offline experiment, we used three types of preambles: a *pro*, a pronoun (*ele* ou *ela*, *he* or *she*), or an R-expression. We tested what type of element in the preamble would elicit a higher production of sentences that were coreference-driven. In addition, we compared the elements used on production according to the type of preamble offered.

The first online test was a self-paced reading experiment, which tested the Principle C (permission versus blocking), and morphological gender (match versus mismatch) in sentences with potential and mandatory backwards anaphora. The second self-paced reading experiment tested the position of the pronoun (backward versus forward anaphora) and the phonological material (lexical pronouns versus *pro*). The eyetracking experiment tested the elements order (backwards versus forwards anaphora), the phonological material (lexical pronoun versus null) and the syntactic Principle blocking (either B or C).

Overall, the set of experiments allows us to say that there is an effect caused by the order of elements, leading to a difference between forwards and backwards anaphora/cataphora. The presence or absence of phonetic material in the pronouns also seems to play an important role in the comprehension of potentially coreferential structures in Brazilian Portuguese. Besides, the structural licensing as stated in the Binding Theory (Chomsky, 1981) was shown to be validated as for its restrictions in the results we found.

Keywords: coreference; backwards anaphora; pro-drop; experimental syntax.

COMPARING GOOD AND POOR READERS' COMPREHENSION

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Reading comprehension is a multicomponent process that requires the efficiency of text-based representation and the construction of a situational model (KINTSCH, 1998). The first highly relies on word recognition, linguistic knowledge and memory capacity. The second depends more on world knowledge, integration and inference generation. A good text understanding is reached when readers are able to represent the main propositions in memory but also to integrate the text content to their previous knowledge and experience. This research aims to investigate if good and poor readers' comprehension differs on text-based representation and/or situational model by assessing their reading comprehension through literal and inferential questions in reading and listening comprehension tasks. The participants were 139 students at the 8th grade of public schools recruited from a group of 336 8th graders. They all accomplished a reading and a listening comprehension task with 6 texts (3 oral and 3 written) each followed by 5 multiple choice questions, summing up 30 points, 15 for each tasks. The groups were classified according to their performance in the reading task: good readers had scores at least 1 standard deviation above the mean and poor readers at least 1 standard deviation below the mean. After selecting the groups, their performance on literal and inferential questions was compared. The comparisons were done by non-parametric statistical tests, as the variables were not normally distributed. The results showed that both groups were better answering literal questions as compared to inferential ones on reading ($Z = -6,97$; $p = 0,001$) and on listening ($Z = -2,80$; $p = 0,001$) task. Table 1 presents the means and standard deviations of the percentage of right answers for each group. Good readers had significant better performance in literal and inferential questions.

Table 1. Percentage of correct responses

	Good Readers (n. 75)	Poor Readers (n. 64)
	Mean (SD)	Mean (SD)
Reading - literal questions	93.11 (9.52)	39.32 (22.29)**
Reading - inferencial questions	80 (10.80)	21.52(11.69) **
Listening - literal questions	84.66 (14.69)	58.59 (26.39)**
Listening - inferencial questions	56.14 (17.70)	34.54 (16.45)**

** $p < .001$

The results seem to confirm the hypothesis that poor readers have difficulty in inference generation. According to Kintsch's Construction Integration theory, building a coherent situational model is a complex task and may be challenging even for good readers. On the other hand, it was surprising that poor readers also have low performance on literal questions, which reflects problems on text-based representation. This study showed that Brazilian young readers with low reading ability even after eight years of formal education still struggle on basic reading processes as text-based representation. It also shows that poor readers have difficulty in generating inferences while resolving reading and listening comprehension tasks. These results have important educational implications pointing to the necessity of providing poor readers with instruction on complex as well as on simple reading processes. Moreover, instruction on inference generation may be extended to oral text comprehension activities.

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LEARNING HUMAN WORDS

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The fact that human adults can effortlessly store tens of thousands of words in their long term memory is remarkable, since other arbitrary signs like telephone numbers or dates are hard to memorize. Some other mammals and birds can understand a reasonable number of human words and/or gestures, but only after extensive training carried out by humans. There has been controversy whether those species learn lexical items or just some kind of simple symbolic system (Terrace et al. 1979; Pinker, 1994). According to many theoretical views, the human lexicon is not only composed of meaningful units, but also of features that restrict the way these items can be combined into phrases and sentences. Furthermore, lexical items undergo morphological processes such as inflection and composition. It is still an open empirical question to determine if other species can interpret at least some of these lexical features.

In order to better visualize the human/non-human distinction in word learning, let us consider three basic properties of a human lexical item: (1) it is stored in the long-term memory, (2) it can be conventionalized, and (3) it can be categorized through formal features. The main purpose of my work is to review results from studies involving human language training in non-human animals and thus verify the hypothesis that no species but *homo sapiens* shows any evidence of knowledge of the third property in comprehension or production.

Some data is given by studies with the adult bonobo Kanzi (Savage-Rumbaugh et al. 1993). When told to “make the snake bite the doggie”, Kanzi correctly picked up both toys, but he put the snake in the dog's mouth. It can be argued that he recognized the referents and the event expressed in the utterance. However, he had not distinguished the agent and the patient related to the action encoded in the order of the verb arguments. As for humans, experiments on language acquisition show that infants can relate word order and semantic roles from the age of 16 to 18 months (Hirsch-Pasek & Gollinkoff 1996).

A similar example comes from a chimpanzee named Sarah, who was taught to interpret plastic tokens on a board (Premack & Premack 1972). After reading the sequence of symbols meaning *Sarah-put-apple-pail-banana-dish*, she acted according to the instructions and put an apple in a pail and a banana in a dish. The authors came to the conclusion that Sarah could understand sentence structure, since she did not put the apple, the pail and the banana altogether in the dish. However, this conclusion may be questioned because there is no mention of controlling for other linear or structured interpretations contained in the sequence besides *apple-pail* and *banana-dish*.

Although the experiments were not explicitly designed to check human grammatical features present in the learned lexical items, a few authors showed some concern about it. The chimpanzee Sarah, for example, is said to adequately use relational words such as “same” and “different”, and she could also distinguish words for class and individuals, which suggests that she was able to understand different (human) categories of words. It is hard to tell if these artificially induced behaviors match the conceptual way in which non-human animals perceive the world. At least some semantic categorizing (individual, class, agent, quality) may be part of their competence, but if only formal features of linguistic structure (argument structure, headedness, finiteness) are considered, then no evidence seems to be available in the results.

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The Production of Long Distance WH-Questions in Brazilian Portuguese by Typical Developing Children and Children with Specific Language Impairment
Maria de Lourdes Servilheira Valezi / Elaine Grolla/ USP São Paulo

This paper investigates how two populations (typical developing children (TD) and children with Specific Language Impairment, SLI) produce Long Distance WH-questions (LD-WH), as in (1). This kind of structure has already been studied with children in several languages and, in general, it is found that TD 4-year-olds have no difficulty in producing them. However, together with adult-like questions such as (1), children in these studies also produced some non-adult questions, like (2). Studies on how children with SLI produce and comprehend WH-questions have also been reported in Portuguese [1], [2], English [3] and French [4], among others. In these studies, children were significantly impaired in producing WH-Questions and showed difficulty in comprehending them. Correa & Augusto's (2011) experiment [5] tested 300 children with SLI from 7;8 to 9;10 to check their comprehension abilities relating to complex structures, such as WH-questions. They report that, when faced with complex structures, children made use of cost minimization strategies, such as short-distance WH-questions where a LD-WH was appropriate. In the present study, we investigate how children with SLI produce LD-WH Questions in BP and compare their productions to those of TD children. An experiment modeled after [6] has been conducted with 22 children with SLI from 5;0 to 11;0 and 19 TD children from 4;0 to 6;6 (data collection for age-matched subjects still in progress). For the TD children, there were a total of 334 LD-WH-questions produced. 321 (96%) were adult-like. 6 (1.8%) were partial WH-movement questions and 7 (2.2%) were WH-copies. Examples of children's productions are shown in (3). For children with SLI, there were a total of 347 WH-questions produced. 100 (28,8%) were LD WH-questions, 155 (44,6%) were short-distance questions and 92 (26,2%) were other types (such as yes/no questions, sequence of questions, etc). Out of the LD-WH questions, 95 (27,3%) were adult-like; 1 (0,3%) was WH-copy and 4 (1,15%) were partial WH- movement. Examples of children's production are shown in (4). On one hand, our data confirms Correa&Augusto's results, that is, children with SLI make use of strategies to minimize the processing cost of complex structures, such as WH-in-situ to avoid movement and short-distance questions to avoid LD movement. On the other hand, our data differs from Correa&Augusto's, given that our SLI subjects did produce a considerable amount of LD WH-questions (27,3%). This leads us to assume that this structure is present in their grammar, although SLI children resort to it far less frequently than TD children do.

(1) [CP O que você acha [CP que o João comeu ___]]?

What you think that the John ate 'What do you think John ate?

(2) English (Thornton 1990):

- a. **What** do you think **who** jumped over the can? (partial WH-movement question)
- b. **Who** do you think **who** is in the box? (copy WH-question)

(3) Brazilian Portuguese (TD children)

- a. **O que** você acha **o que** está dentro da panela? (copy WH-question) FR (4;11)
 What you think what is inside the pan 'What do you think is inside the pan?'
- b. **O que** você acha **onde que** a Poli foi? (partial WH-movement) CL (4;3)
 What you think where that the Poli went 'Where do you think Poli went?'

(4) Brazilian Portuguese (SLI children)

- a. **O que** você acha **onde que** tá a formiguinha? (partial WH-movement) NB (5;11)
 What you think where that is the little-ant? 'Where do you think the little ant is?'
- b. **O que** você acha **que** tem no caminhão? (LD WH-question – adult-like) VB (9;0)
 What you think that is in the truck? 'What do you think is in the truck?'
- c. **O que** tem aqui dentro? (Short distance WH-question) GB (6;4)
 What has here inside? 'What is inside here?'

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ACTING-OUT THE CONCEPT OF A NOVEL VERB AND ITS INFLECTIONAL VARIATIONS: A PRELIMINARY STUDY WITH FOUR-YEAR-OLD BRAZILIAN CHILDREN

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This work investigates the acknowledgement by children acquiring BP (Brazilian Portuguese) of the root as the part of the verb that has the permanent meaning, despite inflectional variations of affixes. Previous studies suggest that children on an initial period of lexical acquisition treat words that have different phonological forms as completely different words (JUSCZYK; ASLIN, 1995; BORTFELD et al., 2005; SHI; LEPAGE, 2008; JUSCZYK; HOUSTON; NEWSOME, 1999). In this sense, morphology could represent a challenge to lexical acquisition, as morphological processes (derivation and, mainly, inflection) create phonologically different words that share part of their meaning. With regard to verb acquisition, Shi & Cyr (2010) and Molina (2014) showed emerging but limited knowledge of morphological alternations by children at 24 months. Our hypothesis is that children proceed to verbal internal segmentation between root and affixes and assign the permanent concept to the root by recognizing recurrent verbal affixes. An experimental activity using the Act Out Technique was developed to verify if four-year-old children acquiring BP would act out the concept of a novel verb (“mepou” – simple past) just after a brief presentation of its meaning. We also seek to verify if an inflectional variation of this novel verb (“mepa” – simple present) would be treated as sharing the same concept. With the purpose to test how children would treat a word phonologically but not morphologically related to the novel verb, we used the form “mepu” (since –u is not a verbal morpheme of Portuguese). We expected that children at this age would recognize the pseudo-word as a verb by using distributional cues and by perceiving in “mepou” a frequent verb suffix (-ou). They would also deal with “mepa” as a variation of “mepou” because –a word ending, in this case, would be recognized as a frequent verb suffix of Portuguese. On the other side, “mepu” would not be treated as a morphological alternation of “mepou” even though these words are phonologically similar. Preliminary results indicate that children (n=10) perceived the pseudo-word “mepou” as a verb and mapped the concept previously shown to this word. Besides, “mepa” was treated as an inflectional variation of “mepou”. On the other hand, children acted out to “mepu” as semantically related to “mepou” at the chance level. Paired comparisons were significant between “mepou” and “mepu” conditions ($p=.04$) but not significant between “mepou” and “mepa” ($p=.17$). It suggests that children at this age map an action into a novel verb and treat morphologically but not phonologically related words as having the same basic meaning. It can also be interpreted as evidence of verbal internal segmentation and the consequent acknowledgement of verbal root as the part of the word that has the basic meaning by 4-year-old children. The result is consistent with Phonological Bootstrapping (MORGAN; DEMUTH, 1996; CHRISTOPHE et al., 1997) and Syntactic Bootstrapping (GLEITMAN 1990) hypotheses, since they showed the passage from a phonological and distributional analysis to a syntactic treatment of the linguistic input on verb acquisition.

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CONSTRUAL OF RELATIVE CLAUSES: AN INVESTIGATION ON THE REFERENTIALITY PRINCIPLE IN BRAZILIAN PORTUGUESE

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The Construal Hypothesis (FRAZIER & CLIFTON, 1996, 1997) proposes that the processing of relative clauses does not involve an immediate attachment on basis of structural principles, such as Late Closure, but, in fact, a syntactic operation of association that may leave some structural relations unspecified, which will be determined using nonstructural and structural information. According to Gilboy, Sopena, Clifton and Frazier (1995), a nonstructural principle that has the potential to influence the relative clause interpretation is the Referentiality Principle, which predicts that, when two hosts for the relative clause are available, perceivers will prefer hosts that are referential in the sense that they introduce or refer to a discourse entity, assuming that a head noun is referential when introduced by a determiner. These authors, with data obtained from a questionnaire study done in English, provided support for the mentioned principle by the evidence that in complex NPs of substance interpretation, such as “the sweater of cotton”, the N_1 is most likely to be referential and the N_2 is most likely to be nonreferential, with a general preference for the N_1 as host of a following relative clause (“Yesterday they gave me the sweater of cotton that was illegally imported”). Most importantly: when a determiner is added to N_2 , making it referential, there is a significant increase in chance of it being selected as host of a following relative clause (“Yesterday they gave me the sweater of the cotton that was illegally imported”). In order to investigate this influence of the Referentiality Principle in Brazilian Portuguese, two experiments were conducted: the first was a self-paced reading task and the second was a questionnaire study. In the first experiment, two independent variables were manipulated, namely, the referentiality of the N_2 and the gender of the participle that appears in the relative clause, resulting in four experimental conditions: “O policial apreendeu/ a bolsa de couro/ que foi irregularmente importada/ pela empresa”, “O policial apreendeu/ a bolsa de couro/ que foi irregularmente importado/ pela empresa”, “O policial apreendeu/ a bolsa do couro/ que foi irregularmente importada/ pela empresa” and “O policial apreendeu/ a bolsa do couro/ que foi irregularmente importado/ pela empresa”. After each experimental item, there was a comprehension question that focused on N_1 , like “A bolsa foi importada?”. In the second experiment, just the referentiality of the N_2 was manipulated, resulting in two experimental conditions: “O policial apreendeu a bolsa de couro que foi irregularmente importado pela empresa” and “O policial apreendeu a bolsa do couro que foi irregularmente importado pela empresa”, which were followed by a comprehension question like “O que foi importado?”. Focusing initially on the results of the first experiment, the Analysis of Variance (ANOVA) did not reveal influence of the Referentiality Principle on the processing of relative clauses, but reveal a significant effect of gender information ($F(1,31) = 8,31$ $p < 0,007$), showing that the participants prefer the N_1 as the host of the relative clause and answer YES to the final question even when this answer was incorrect. These results are discussed in terms of the Construal Hypothesis and in terms of the Good-Enough Theory (BRYSSBAERT & MITCHELL, 2000; FERREIRA et al., 2002; CHRISTIANSON et al., 2001; RIBEIRO, 2008, 2010, 2012; SWETS et al., 2008). Turning now to the results of the second study, the Chi-squared test was able to capture an influence of the Referentiality Principle ($X^2 = 7, 88$; $p < 0,05$), evidencing that the number of N_2 responses was significantly higher when this noun was referential than when it was nonreferential, as predicted by Gilboy et al. (1995). The online and offline data obtained from the two experiments reported are considered in a discussion about types of information and analysis mechanisms that are associated with early and late stages of language processing.

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TRANSLATION OF A LINGUISTIC WORKING MEMORY TASK

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This study presents a Portuguese translation of a working memory task developed originally in English by Waters and Caplan (1987), and an investigation of its correlation with reading comprehension. Working memory (WM) is responsible for the processing and temporary storage of information, and it is essential in the simultaneous process of extraction of information and construction of meaning while reading a text. The information processed during reading is usually lost almost instantaneously, yet it can also be stored in long term memory (Baddeley, 2000). The original working memory task by Waters and Caplan (1987) is constituted by 80 sentences, divided in four categories: cleft subject, cleft object, defining relative clause after subject, defining relative clause after object. The items are also subdivided into acceptable and unacceptable, with the unacceptable being the ones containing the inversion of animacy of the subject and object noun phrases, whereas the acceptable ones have those phrases in proper order. The translation we propose aims to further the Brazilian studies on working memory by providing a more precise and more complete task than the ones available today in Brazil (Bateria de Avaliação de Memória de Trabalho, UFMG, 2001). Therefore, while translating it, we sought to preserve the linguistic criteria of the original task, as well as to adapt its elements to the Brazilian context, in order not to cause participants any kind of unfamiliarity, for example we ensured that the last word of each sentence had no more than three syllables, and also that they were phonologically distinct. In addition, to investigate whether our translated WM task correlated with reading comprehension as in the original study (Waters and Caplan, 1987), 20 participants completed the translated WM task along with a reading comprehension task. In this task participants read short passages and had to verify whether a set of statements about them was correct. Preliminary results suggest that participants' working memory capacity is positively correlated with reading comprehension, such that participants with higher capacity scored higher on the reading comprehension task.

Key Words: Working Memory. Linguistic Task. Reading Comprehension.

The Comprehension of Passive Sentences in terms of Exclusive Syntactic Cost and Discourse Continuity: Implications for Language Acquisition

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This study aimed at investigating to which extent periphrastic verbal passives in Brazilian Portuguese are syntactically costly for comprehension. Secondly, it has been questioned how well this computational cost -if any- may be adequately captured by the available syntactic analyses. The main results of two experiments are reported. The first one examines the existence of syntactic cost in passives by eliminating factors such as *animacy* of the DP-subject and *reversibility*. The second one explores the role of *discourse continuity* in reducing the processing burden concerning the structures at stake. The hypothesis is that verbal passives are syntactically challenging for children to comprehend, independently of other additional sources of cost (eg., *reversibility*). It is also claimed that favorable conditions of processing are relevant for the acquisition of verbal passives to occur (eg., *discourse continuity*). For many years, different syntactic mechanisms have arisen as possible reasons to explain children's low performance on verbal passives. Maturationist theorists claimed that this has been so for specific syntactic principles would be subjected to maturation (see Borer & Wexler, 1987; Fox & Grodzinsky, 1998). Thus, a delayed acquisition process of passives was characterized. More recently, in the light of various results of *priming experiments* (Messenger et al, 2012; Bencini & Valian, 2008; among others) and of tests adjusted to be pragmatically adequate (O'Brien, Grolla & Lillo-Martin, 2006; but see Lima Júnior & Corrêa, 2014 for different results), it has been assumed that the acquisition of passives is not specially delayed. It is not completely clear, however: (i) if it is possible to characterize specific syntactic cost apart from more general conditions of processing; (ii) if the absence of pragmatic adequacy can fully explain the reported difficulty *typical* (Lima Júnior, 2012; and reference therein) and *impaired* children (Van der Lely, 1996) -as well as *aphasic individuals* (Grillo, 2008)- have with verbal passives across languages. **In order to explore (i)**, inanimate subject-DPs have been used as to eliminate the possibility of strategic attribution of the agent-role to the subject DP (Ferreira, 2003; and reference therein) *in experiment 1*. Irreversible sentences were created bearing in mind that *reversibility* may play an independent role in processing (Richardson, Thomas & Price, 2010), possibly adding cost to it (Lima Júnior & Corrêa, 2013). Verbal passives (*o copo foi quebrado por minha irmã/por minha causa*) were, then, contrasted to the *adjectival* ones (*o copo está quebrado por minha causa*) in a self-paced reading task. 25 adults were tested. The residual reading time of the segment auxiliary + participle and of the PP-region was taken as the dependent variable. The results indicate that verbal passives take longer to read in the AUX+PART region; the by-phrase (*por minha irmã*), on the other hand, is more quickly read than the causal prepositional phrases (*por minha causa*). Taking these results into account, two proposals are presented and contrasted: Snyder & Hyams (2014) and a second one based on Lima Júnior & Augusto (2014). It is believed that the results obtained in this study favor the last proposal. **In order to explore (ii)**, discursive information was manipulated in a test involving children. In the task proposed in *experiment 2*, kids had to select a picture after hearing a short story (taken as the referential context), in which there was a coincidence between the topic of the story and the subject of the target sentence; namely, *discourse continuity*. The independent variables were structure (active x passive) and maintenance of the topic of the story given and the subject of the sentences tested (maintained x not-maintained). 60 children between 4-6;6 were tested and divided into two groups according to their age. The results of this last experiment showed that passives are more costly than actives and that this difficulty tends to decrease in groups of older children. Moreover, it seems that younger children can benefit from the maintenance of the topic of the referential context by the subject of the target sentence. **In sum**, the results confirm the costly nature of verbal passives, and reveal that certain pragmatic conditions, as *discourse continuity*, may diminish the processing burden for the recognition of the relevant information concerning these structures.

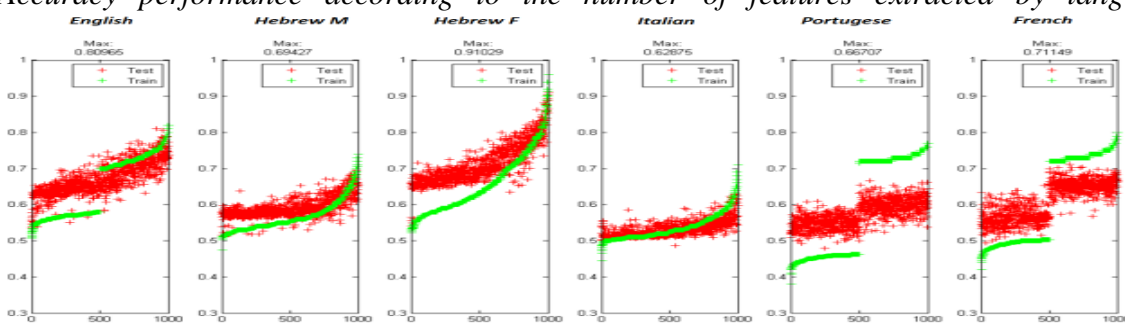
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THE UNIVERSALITY OF MOTHERESE PROSODIC CHARACTERISTICS

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Introduction. Motherese, also known as infant-directed speech (IDS) or “baby-talk”, refers to the spontaneous way in which mothers, fathers, and caregivers speak with infants and young children (Saxton, 2008). General linguistic and prosodic characteristics of IDS were found in a variety of languages, and IDS is not restricted to mothers. Phonological, lexical and syntactic properties of IDS contribute to infants’ language acquisition and comprehension (Soderstrom 2007). Perform cross cultural studies use computational and multidisciplinary approaches to investigate social interaction (Meltzoff et al., 2009). Since during IDS, caregivers do not constantly use speech with the emotional prosodic characteristics of IDS (that we will further call motherese in this paper), we recently develop a motherese classifier based on machine learning methods that could distinguish emotional prosodic IDS sequences typical of motherese from prosodic IDS sequences that were not (Mahdhaoui et al, 2011). This algorithm allowed us to study in home movies, caregivers’ adaptation when interacting with an infant that will later develop autism (Cohen et al., 2013). Here, we aimed to study several data bases of IDS with machine learning algorithm based on acoustic components both in uni-language condition (motherese classifier trains in one language and tests the same language) and cross-over language condition (motherese classifier trains in one language and tests another language). **Méthode.** In the current study, we used 6 databases corresponding to five different languages: English, French, Hebrew, Italian, Brazilian Portuguese. Here, we aimed to study several data bases of IDS with machine learning algorithm based on acoustic components both in uni-language condition (motherese classifier trains in one language and tests the same language) and cross-over language condition (motherese classifier trains in one language and tests another language). We used Sound Forge 9.0 to extract the vocal segments from each video sequence. Hebrew, Portuguese and French vocalizations were automatically segmented (with Matlab) from manual annotations timeline performed through ELAN. The speech segments are typically between 0.5 seconds and 4 seconds in length. The verbal interactions of the caregivers were carefully annotated by two blind psycholinguists into two categories: motherese and normal speech. **Resultats.**

Accuracy performance according to the number of features extracted by languages



Discussion. Since all testing results were significant and above chance recognition, the study shows that some common prosodic features are enough to determine what emotional prosodic IDS is. We found that accuracy scores of testing another language that during training were lower than in the one to one condition in 90% of the cases. However, we are aware that the current results have many limitations. Data bases were obtained from diverse sources and quality of recording. Infant ages were not similar across data sets, and this can have influenced the quality of IDS.

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DEVELOPMENT OF A LANGUAGE BACKGROUND QUESTIONNAIRE FOR RESEARCH WITH BILINGUALS

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Research investigating different aspects and effects of bilingualism has shown divergent results over the years about the cognitive outcomes associated with bilingualism. Many studies have documented advantages for bilinguals on cognitive tasks; however, other studies have reported negative, null or mixed effects of bilingualism (ADESOPE et al., 2010). One possible reason for this unconformity may be the fact that there is a great discrepancy between the bilingual participants selected for these studies (GROSJEAN, 2006). These inconsistencies may be enhanced by the lack of uniform instruments to assess bilingualism; therefore, there is a need for the use of standardized language self-assessment tools that combine experience variables and proficiency. In order to contribute with research about bilingualism in Brazil, this study discusses the development of a language background questionnaire that aims to evaluate the linguistic profile of Brazilian adult bilinguals participating in research on bilingualism. Thus, we present some definitions of bilingualism and discuss the three criteria for evaluating the bilingual experience that we consider most important for understanding the linguistic experience of individuals, based on the literature on the subject: (i) age of acquisition; (ii) domains of use; and (iii) proficiency. In order to take into account the individual differences of bilingual speakers it is important that these aspects are included in the language background questionnaire used for selection of research participants. Based on the criteria defined, we analyzed three language background questionnaires: (i) *L2 Language History Questionnaire* (LI; SEPANSKI; ZHAO, 2006); (ii) *Language Experience and Proficiency Questionnaire* (LEAP-Q) (MARIAN; BLUMENFELD; KAUSHANSKAYA, 2007); and (iii) *Language and Social Background Questionnaire* (LSBQ) (LUK; BIALYSTOK, 2013). Even though the questionnaires have as their goal the creation of a standardized instrument that comprehends the fundamental questions in order to measure the bilingual experience to be used in research, we found that they do not include questions that address satisfactorily all the essential criteria discussed. Finally, we propose a language background questionnaire containing quantitative and qualitative questions reflecting the theoretical discussions made. The questionnaire is divided in five parts: (i) personal information; (ii) languages history; (iii) functions and uses of language; (iv) proficiency; and (v) other information. The target population is Brazilian adult bilinguals with different bilingual experiences and levels of proficiency. The questionnaire is now in the process of validation, and there will be a correlation between the self-rated proficiency of Brazilian bilinguals in their L2 English and their results on the TOEFL ITP.

Keywords: bilingualism; bilingual experience; language background questionnaire.

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RECOGNITION OF OWN NAME, FOR BABIES FROM 6 TO 7 MONTHS OLD.

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INTRODUCTION: The recognition of the own name is indicative of the acquisition process of the child's language, it provides data about hearing acuity, the phonetic-phonological and prosodic perceptual factors of language and the child's relationship with its surroundings. **OBJECTIVE:** To correlate data obtained through the evaluation of hearing, language and recognition of child's own name with findings in literature. In addition, we sought to identify the characteristics of the responses provided by children 6 and 7 months old when they respond to the evocation of their own name in experiments controlled by pre-established parameters. **METHODS:** After approval by the Ethics Committee (0418.0.203.000-11), 36 children who were evaluated at Universal Newborn Hearing Screening (TANU) participated in this study in charge of research institution. Exclusion criteria: to have a neurological and / or visual impairment; have a compound name; didn't sign the free and informed consent form; to have any alteration in the assessment of TANU; answer affirmative for the items in Questionnaire about Child and Family Linguistic Experience Concerning First Name. After the selection of subjects a list of first names was created and organized into 3 categories, by pairing, about phonological parameters in First Name (FN) and Other Name (ON). Afterwards, children were re-evaluated by Transient otoacoustic emissions to verify the hearing and the following tests: Early Language Milestone (ELM) and adapted protocol for children's Assessment (0 to 24 months old) for language investigation , babies were routed for specific test for Own Name Recognition Assessment in a sound -treated room .The child stayed in mother's lap, and while watching a children's DVD, was exposed to sound stimuli of FN and ON in a random alternated and bilateral way .We used "look for the sound source" and "duration of attention for source" as criteria for analyzing the children's response . **RESULTS:** The babies paid attention for a longer period and searched harder for their own name when alternated with another name, best observed in the category 1 of stimuli. In this category, the phonological duration and components were different.

Topic investigated	Category 1 (n=21)		Category 2 (n=18)		Category 3 (n=9)		
	FN	ON	FN	ON	FN	ON	
amount of look for the sound source	0 – 1	4,8%	9,5%	11,1%	11,1%	0%	11,1%
	2 – 3	95,2%	90,5%	88,9%	88,9%	100%	88,9%
	Valor-p	0,55		1,00		0,30	
duration of attention for source	average time seconds	6,32	6,13	4,90	5,94	5,05	5,49
	Valor-p	0,70		0,35		0,95	

FN : first name (own name) /ON : other name . category 1 : duration and different phonologicals components / category 2 : similar duration and different phonologicals components /category 3 : duration and similar phonologicals components

CONCLUSION : This study confirmed data in literature that babies are aware of the phonological properties of the language . The subjects of 6 and 7 months old used the suprasegmental characteristics: rhythm, intonation of speech and duration to recognize the name. The clinical significance of the findings of this research is the application of the assessment of recognition of own names in clinical practice in order to equip professionals in the primary health care to identify possible alterations in development of hearing, language and child's psychic constitution.

Keywords: child development, speech perception, hearing, language, cognition

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ORAL NARRATIVE PRODUCTION AND REFERENTIATION IN ALZHEIMER'S DISEASE

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Language deficits tend to occur since the initial stages of Alzheimer's disease (AD) and the advancing establishment of the disease brings significant communication impairment, leading to the participant's progressive loss of autonomy (AHMED *et al.*, 2013). Among language deficits, the discourse represent a major problem, demanding support from the interlocutors (SOARES; BRANDÃO; LACERDA, 2012). Text references are amongst the elements which bring coherence to the text by introducing or recovering a referent (KOCH, 2011; KOCH, 2012; KOCH; ELIAS, 2012). Research has indicated elderly with AD may have issues in producing narratives with visual aids. When speaking about pictures of a sequence of a story, elderly tend to present not only reduced content vocabulary, pronouns without references, few information units, excessive use of deixis. But also other characteristics that may disturb the flow of the narrative (DIJKSTRA *et al.* 2004; CARLOMAGNO *et al.*, 2005; SKA; DUONG, 2005; SAMARA 2005; WALES, 2006; MARCH, PATTISON, WALES, 2009; MURRAY, 2010; ZRAICK *et al.*, 2011; DE LIRA *et al.*, 2011; SOARES; BRANDÃO; LACERDA, 2012; DE LIRA *et al.*, 2014). It has not been known any research regarding the investigating of oral productions of the News. It corresponds to a neutral stimulus text which does not present any visual aid, neither is based on personal experience. Thus, the aim of this study is to analyze elderly's reference processing in two types of oral production: narratives with the aid of a sequence of pictures and free narration of a news type of text. 19 healthy participants' performance was compared to the outcome of 4 case studies diagnosed with AD. The groups' age varied between 60 and 88 years old and they all ranged from 2 to 6 years of schooling. The research is in progress and the preliminary results indicate that elderly diagnosed with AD produce fewer referents, referential chains and recalling process, and more referents deictic, compared to healthy elderly. Even though the results seem to be still exploratory, it might be a key point to consider the understanding the narrative oral production in healthy aging and in AD since it brings.

Keywords: Alzheimer's Disease, narrative production, referentiation

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**AN HPSG ANALYSIS OF THE SPANISH INCHOATIVE MARKER 'SE' ON THE
INTERLANGUAGE OF ENGLISH AND BRAZILIAN PORTUGUESE SPEAKERS:
PSYCHOLINGUISTIC EVIDENCE**

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This work is a part of my doctoral dissertation and aims to contribute with empirical data for formal research in second language acquisition investigating linguistic typology as a central issue in this process. We seek to establish a connection between a representational theory for second language acquisition: The Multiple Grammars Theory (Amaral & Roeper, 2014) and a formal lexicalist descriptive model: HPSG (Head-Driven Phrase Structure Grammar), originally proposed by Pollard & Sag (1987), in order to clarify the relationship between lexicon and grammar. The research focuses on the similarities and differences in morphosyntactic processing of Spanish as a second language (L2) on the advanced interlanguage of adult English and Brazilian Portuguese (BP) speakers, as a first language (L1). We investigate the inchoative use of the clitic pronoun 'se' in Spanish, which has multiple semantic nuances and structural possibilities, as in '*La flecha se rompió*' (The arrow broke). An Auditory Acceptability Judgment Test with the inchoative 'se' was conducted to verify the acceptability of sentences with and without the inchoative marker 'se' in Spanish, contrasting *La flecha se rompió* vs. *La flecha rompió*. It was performed with 16 native Spanish speakers, of various nationalities, 16 BP speakers and 16 English speakers, as L1, advanced learners of Spanish (L2), in a within subjects design. We tested the hypothesis that there are typologically sensitive differences between those L2 languages when compared to the native Spanish grammar. Results of this experiment point to an L2 morphosyntactic processing sensitive not only to the use of clitics, as well as to the close or distant typology of the languages in relation to Spanish. The relevance of this work is precisely given by the lack of studies trying to establish a dialogue between linguistic representation and processing in the context of bilingualism, focusing on linguistic typology. Thus, we aim to contribute to the viability of such connection, leading, as a consequence, to a greater understanding of the competence of advanced learners of Spanish L2 having a typologically closer L1, as Portuguese, and a typologically less related language, such as English.

Keywords: Acquisition of Spanish as a second language (L2); Experimental Psycholinguistics; Multiple Grammars; Linguistic Typology; HPSG.

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THE ONE-STEP ANAPHOR PROCESSING IN BRAZILIAN PORTUGUESE

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Introduction: The aim of this study is to discuss the existence of two steps in anaphor processing. There is some evidence that in English the anaphor processing takes place in two stages (Sturt, 2003; Kennison, 2003): an initial stage called Bonding, when the principle A of the Binding Theory (Chomsky, 1981) is applied and a final stage, Resolution, when non-structural information could be taken into account. Oliveira, Leitão & Henrique (2012), in a self-paced reading experiment which manipulates the availability of the antecedent, showed that there was no interference of non-structural information in the anaphor resolution of the form "*a simesmo(a)*" in Brazilian Portuguese (BP), at any moment of the coreferential processing. As for BP, Nicol & Swinney (1989) found evidence that initially only the structural information counts in the intrasentential processing. Déchaine & Wiltschko (2002), by assuming the Binding Principles as epiphenomena, argue that reflexives DP (in which class the reflexives *himself/herself* would fit) are bound to an antecedent through coreference assignment. In case there is no local antecedent available, they behave as logophors, which could explain the facts for English. As for the BP data, we believe that the results have to do with particular traits of the *se/si* reflexive in this language, since studies on this subject (Brito, 2009) show that *se/si* can have antecedents of any grammatical specification (phi features), as long as they are in the same local domain. Thus, for the processing of *se/si* reflexives in BP, only the structural information is taken into consideration. Aiming to contribute and expand this discussion, we replicated Oliveira, Leitão & Henrique (2012)'s reading comprehension task experiment, now using a more accurate technique, a 1000Hz eye tracker.

Materials & Methods: We asked 26 participants to read sentences which had both an unavailable and an available antecedent for the complex anaphora "*a simesmo(a)*", followed by comprehension questions that required the choice of the antecedent for the anaphor. We divided the experimental sentences into six different sets of stimuli (24 experimental sentences between 48 fillers – a 3 x 2 design of repeated measures). The tests were recorded on an Eye Link 1000Hz. The independent variables were gender of the unavailable antecedent, gender of the available antecedent and gender of the anaphor.

Results & Conclusion: We analyzed four reading metrics: first pass reading time, total reading time, number of fixations and regression-path duration. 91% of the comprehension questions were answered correctly. We observed a main effect on the interaction of gender of the available antecedent and the anaphor on the first pass reading time ($F(1,25)=7.378$, $p = 0.007$) and on the regression-path duration ($F(1,25)=5.156$, $p = 0.02$). Concerning the reading time, the main results show roughly an initial processing of the binding principle A during the reading of the anaphor "*a simesmo(a)*". The results move towards to the assumption that the restriction occurs on the first step of processing, contra Badecker and Straub (2002), who claim that unavailable antecedents are taken into consideration in the online processing. Our results show no relevant variation in the processing of the different experimental conditions, which corroborates the results of the self-paced reading paradigm found by Oliveira, Leitão & Henrique (2012). It seems that the two-step anaphor processing in English (*himself/herself*) diverges from the one-step anaphor processing in BP (*a simesmo(a)*).

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VOWEL HARMONY AND VOWEL RAISING: EVIDENCE FROM ACQUISITION

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Brazilian Portuguese (BP) has seven stressed vowels /i, e, ε, a, ɔ, o, u/ which neutralize to five in pre-tonic position /i, e, a, o, u/ (Câmara Jr 1970[1999], Wetzels 1992). This position is also the locus of instability for being affected by phonological processes, including vowel harmony of height (VH) by which /e, o/ optionally assimilate to [high] when either /i, u/ are in the immediately following syllable (me'nino ~ mi'nino, kuruʒa ~ kuruʒa, bo'nito ~ bu'nito) (Bisol 1981). However, studies suggest that /e/ and /o/ raisings occur for different reasons: while /e/ raising results solely from phonological assimilation, /o/ raising is also highly conditioned by surrounding velar and labial consonants and may even dispense with the presence of a high vowel (mo'derna ~ mu'derna, go'vernu ~ gu'verno, bo'laʃa ~ bu'laʃa) (Yacovenco 1993, Viegas 2001, Callou et al 2002). This study compares the acquisition of vowels in tonic and pre-tonic positions based on Miranda (2013) according to which children are sensitive to the instability of pre-tonic vowels in BP. It also investigates the acquisition of pre-tonic raising as shown in (1) and (2) and verifies its effects on the acquisition of pre-tonic vowels. Finally, it examines whether the children's productions of /e/ and /o/ in pre-tonic position can shed light on the difference between /e/ and /o/ raising. Our hypotheses are: given that the pre-tonic system is affected by phonological processes, it will stabilize later than the tonic system; however, assuming that only /e/ raising is affected by a phonological process, the acquisition of pre-tonic /e/ will take place later than the acquisition of pre-tonic /o/.

Data are from three children acquiring BP from 1;0 to 2;11 (year;month). Two corpora were formed for each child: one including vowels in the tonic position and another in the pre-tonic position. The data totaled 6,911 productions with tonic vowels and 4,381 with pre-tonic vowels. The methodology proposed by Ingram (1981, 1989) was used to determine when vowels had been acquired.

The results for /e/ show that this vowel in pre-tonic position is acquired later than its counterpart in tonic position by the first two subjects and it is still not acquired by Subject 3 at 2;11 (Table 1). We have also noticed that deviant productions of pre-tonic /e/ come to an end once the conditions that govern VH in BP are mastered by Subjects 1 and 2, suggesting that its acquisition is correlated with the acquisition of a phonological rule by which affects it is affected. As for tonic and pre-tonic /o/, results show that they are acquired simultaneously by Subjects 1 and 3, and with a one-month difference by Subject 2 (Table 2). We have also seen that overgeneralizations of /o/ raising persist even after vowel harmony is mastered, affecting strictly forms with labial or velar consonants.

This suggests that (a) /e/ and /o/ do indeed behave differently regarding their raising in the pre-tonic position in BP as pre-tonic /e/ is acquired later than pre-tonic /o/ and (b) segments affected by phonological processes take longer to be acquired.

Table 1: acquisition of /e/ in tonic and pre-tonic position:

	Tonic	Pre-tonic
Subject 1	1;7	2;7
Subject 2	1;8	2;0
Subject 3	1;11	-

Table 2: acquisition of /o/ in tonic and pre-tonic position:

	Tonic	Pre-tonic
Subject 1	1;8	1;8
Subject 2	1;6	1;7
Subject 3	2;4	2;4

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**DIFFERENCES BETWEEN OLD BILINGUAL AND MONOLINGUAL
INDIVIDUALS REGARDING EXECUTIVE FUNCTIONS, WORKING MEMORY
AND LONG-TERM MEMORY TASKS**

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Researches related to bilingualism and aging are recent. Regarding the increase of population's life expectation is a statistically proved fact, it is interesting to propose ideas that make people get older with a higher life quality. The aspect which may cause a higher life quality is the protection against the pathological aging, once several ways to protect elders against neural degeneration may exist. It has been recently investigated the influence of bilingualism on people's cognition. Because of that, the aim of the investigation is to verify the existing differences between healthy bilinguals and monolinguals on performances in non-verbal cognitive tests related to executive functions, working memory and long-term emotional memory. To execute this, a research in an elder Center was developed, counting on, in average, 18 bilingual individuals and 20 monolingual individuals. According to the general aim, it has been investigated if there are differences on performances between both groups involving inhibitory control, working memory and long-term emotional memory. To verify the aim of this research, the data was collected through laptop computers, being used by the researcher and assistants because this project is part of a bigger one whose goals are investigate young, adult and old monolinguals and bilinguals. This research agrees with the dynamic view of language that consists of a complex system in constantly interaction. Some criteria has been used to exclude some people from the research. For example: general interview through questionnaire, depression inventory, socialeconomy test and neurological test. If the subjects have got the allowed score, they would go to the selection tests. There tests were: linguistic questionnaire, Simon task, word span and Cahill test. Although in the Simon task were not found any relevant differences regarding reaction time, a subtle difference related to accuracy was significantly in the statistics level. In the Word Span test divergences between the two groups were not found, despite of being different in terms of quality during the test execution. But in the Cahill test, differences were found. Although the hypothesis, which predicted bilingual performances would be different from monolinguals in some manner, were not corroborated, the findings are still useful to discuss about variables interfering in the results, such as schooling degree, reading skills in all languages, professions, habits. Thus, this project contributed to focus on the importance of the context to investigate languages and, besides that, to increase the number o research about the topic.

Keywords: Bilingualism, elderly, protection

FOCUS CONSTRUCTIONS AND COGNITIVE COMPLEXITY: EVIDENCE FROM A PRIMING EXPERIMENT

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This poster presents the preliminary results of a psycholinguistic experiment of priming with probe recognition. It was developed in order to identify the degree of cognitive complexity, measured in terms of processing time, of a number of Brazilian Portuguese focus constructions. This language has numerous focus constructions. In this poster there are highlighted three strategies that include a “to be” verb form and/or WH word: Canonical *It-clefts* (Foi Pedro que chegou atrasado); *to be* + WH Constructions (Pedro é que chegou atrasado); WH constructions (Pedro que chegou atrasado).

Cognitive complexity is one of the criteria that allows the identification of the element unmarked in a grammatical category, as well as frequency distribution and structural complexity (Givón 1995). The latter feature allows to categorize WH Constructions as less marked structures, since they are less complex. However, it does not allow us to distinguish, in terms of markedness, the Canonical *It-clefts* of the *to be* + WH Constructions, since both require the presence of the verb *to be* and WH word.

Regard to the second criterion, frequency distribution, ongoing research focused on the investigation of the mentioned strategies, in a speech database of synchronic speech, reveals that the WH Constructions are more frequent. It reaffirms its unmarked status. However, statistical results to the Canonical *It-clefts* and to the *to be* + WH Constructions are not conclusive, whereas both have the same statistical distribution.

Given this frame, we proposed a priming experiment with probe recognition, which aims at testing, primarily, the processing time of the aforementioned focus constructions as opposed to neutral clauses (without clefts). Subsequently, the experiment aimed at identifying differences of processing time between all the focus constructions studied. 36 subjects participated in the experiment. Each one should identify probe words (written on the computer screen), after the various sound stimuli being presented to him.

Preliminary results indicate that the focus constructions studied here may permit focused elements to remain longer in the working memory of the subject, compared to the neutral constructions. Furthermore, considering the processing differences between the focus constructions, it was found that the Canonical *It-clefts* and WH Constructions showed more significant results of processing time than *to be* + WH Constructions. It suggested to us the preparation of a second experiment priming with probe recognition involving only this type of construction, to be developed in early 2015.

Keywords: Focus; Functionalism; Processing; Cognition; Priming; Psycholinguistics; Experiment; Probe Recognition.

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BIMODAL BILINGUALISM: A STUDY OF LEXICAL ACCESS OF BRAZILIAN SIGNED LANGUAGE INTERPRETERS

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The study of signed languages presents a different window to understand language processing. The use of language in highly demanding situations such as simultaneous interpreting can be seen as a further opportunity to understand how cognition plays an important role in communication. This paper looks at how lexical access in Brazilian signed language interpreting helps us understand language processing in bimodal bilingualism. The objective of this work is to discuss to what extent bimodal bilingual semantic relatedness of lexical items is affected by different semantic conditions during a translation task involving Brazilian signed language and Brazilian Portuguese. To accomplish our goal we developed a translation task in E-prime where a Deaf native signer presents signs followed by a word in Portuguese which could fit the following conditions: a translation of the sign, a non-translation semantically related, or a non-translation non-semantically related. We asked Brazilian signed language interpreters from different language history and experiences to answer whether the words in Brazilian Portuguese were the correct translation of the signs or not by pressing Yes or No on the keyboard of the computer. Participants were also asked to fill a language history questionnaire to show their language acquisition and experience as interpreters have developed. We analyzed the answers by looking statistically at response time and accuracy. Results were also contrasted to results in the language history and interpreting experience questionnaire.

Key words: bilingualism, lexical access, signed languages, simultaneous interpreting

A STUDY OF MONOLINGUAL AND BILINGUAL CHILDREN ON THE STROOP TEST

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Transfer is one of the key concepts which have withstood many shifts in trends in Second Language Acquisition research over the last forty years. Therefore, the underpinnings of cognitive transfer involving bilingualism and executive functions are viewed through a dynamic systems perspective in this study, which aims at comparing the performance of monolingual and bilingual children in tasks involving executive functions, namely inhibitory control and attention. According to the literature, when a bilingual individual engages in code switching, the control required to inhibit the language(s) not recruited during a specific part of a linguistic interaction may enhance his/her performance in several tasks requiring executive control. Therefore, the increase in executive functions gained during code switching could also favor the processing, control and inhibition of different stimuli in competition during any other verbal task. The main goal of this study was to ascertain whether bilinguals are more accurate and faster in their answers, compared to the monolinguals, when doing the Stroop test. The participants are 80 children: 40 Brazilian and 40 Scottish, 20 of each group monolingual and 20 bilingual. The monolingual Brazilian children speak Brazilian Portuguese and the bilinguals are speakers of Pomeranian and Brazilian Portuguese. The 20 Scottish monolingual children speak English and the 20 bilinguals are speakers of German and English. The task used to measure the children's attention and inhibition is a verbal test called the Stroop Test very well known in Psychology studies. This test was done in laptop computer and children had to press a key (0 or 1) to decide which color the word was written and ignore what the word was saying. The results suggest that bilinguals are faster and more accurate than monolinguals as can be seen in the table below.

Table 1. Comparison of the reaction time and accuracy between monolinguals and bilinguals

GROUP	1 st COND (ms)	Acc (%)	2 st COND (ms)	Acc (%)
Monolinguals	3195,08* (380,36)	97,6* (0,8)	2580,88* (222,30)	94,2* (0,4)
Bilinguals	2093,52* (407,30)	95,6* (0,5)	2057,12* (433,62)	97,0* (0,9)

The results on the table above show statistics difference in the scores when the participants did a verbal test suggesting some advantage for the bilingual group. This study corroborates Bialystok's ones, specially the 2001 and 2004.

Key words: bilinguals; executive function; verbal task

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Pronominal resolution processing in complex structures in Brazilian Portuguese (BP).

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This work aims to investigate some factors involved in pronominal coreference processing with subordinate clauses in Brazilian Portuguese (BP) such as (i) the structural position of the antecedent, (ii) the syntactic parallelism, (iii) the sentence order and (iv) type of anaphoric expression, manipulating gender and number features of the pronouns.

Two self-paced reading experiments were held testing the sentence order “main clause-subordinate clause” and “subordinate clause-main clause”. The subordinate clauses were concessive and the pronoun was always in the subject position in either in its full or null forms. On the other hand, the pronoun antecedents (common nouns) could be either in the subject or object position.

In the first experiment, the number features of the pronouns were manipulated (singular and plural) and the results indicate that the number agreement features interfere significantly in the pronominal resolution in BP.

- (1) [O zelador defendeu os professores no curso] [embora **ele/eles/Ø** fique(m) sempre muito mal com todos.]
- (2) [Embora o zelador defenda os professores no curso] [**ele/eles/Ø** fica(m) sempre muito mal com todos.]

In the second experiment, the structures used were similar to the ones of the first experiment, but at this time, gender agreement was systematically manipulated. The results indicate that gender is relevant for coreference resolution as well as number.

- (3) [O zelador defendeu a professora no curso] [embora **ele/ela/Ø** fique sempre muito mal com todos.]
- (4) [Embora o zelador defenda a professora no curso] [**ele/ela/Ø** fica sempre muito mal com todos.]

In both experiments, 32 undergraduate students at Universidade Federal do Rio de Janeiro and native speakers of Brazilian Portuguese were tested. Each participant was exposed to one of the eight versions of the experiment, which was composed by 96 sentences (32 experimental and 64 distractors).

After analyzing Anova statistical data, the results in both experiments point out that the full and null pronoun forms are neutralized in BP. Moreover, the sentence order “main clause-subordinate clause” displays facilitated processing when compared to the opposite order.

The conclusion is that, differently from other languages pro-drop such as Italian and European Portuguese (EP), the full and the null pronouns are used without distinction in BP. However, the full form is preferred.

Finally, the results found in both experiments indicate that factors like sentence order, pronoun agreement features and antecedent position affect the pronominal coreference processing in BP.

Keywords: Coreference; Processing; Pronoun

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THE PROCESSING OF GENDER AND NUMBER AGREEMENT FEATURES AND STRUCTURAL CONSTRAINTS IN PRONOUN RESOLUTION IN BRAZILIAN PORTUGUESE

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Pronoun resolution can be influenced by structural constraints (related to Principle B) as well as by agreement features (gender and number). Wing-Yee Chow, Shevaun Lewis & Colin Philips (2014) and Parker (2014) investigated the relationship between agreement features and structural constraints in pronoun and anaphor resolution respectively in English. Chow et al (2014) concluded that although some non-structural candidates displayed pronoun feature matching (known as “attractors”), they were not responsible for facilitated pronoun resolutions. Parker (2014) studied attraction effects in anaphora resolution manipulating number and gender. He explains that the parser can be misled by “misalignments”, known as illusions of grammaticality, which are formed when morphological or semantic compatible materials in non-structural positions mislead parser during processing. He concluded that when the reflexive mismatches the structural material in one feature, such as number (not gender), there is interference of the attractor, but when it mismatches in two features, stronger interference is noticed.

Two eye-tracking experiments will be held in Brazilian Portuguese aiming to investigate whether the results found by Chow et al (2014) and Parker (2014) in English, a poor agreement language, would be equivalent to Brazilian Portuguese data. Our hypothesis is that the agreement features did not influence a lot in filtering antecedents candidates because English, differently from Portuguese, do not display visible agreement features. Thus agreement features matching would be stronger in languages with visible agreement features such as Brazilian Portuguese. This work will investigate whether pronoun resolution is sensitive to gender and number features interference in Brazilian Portuguese.

Gender Experiment: *A empresária [*fem*] uma vez contratou um açougueiro [*masc*] que cortou ele [*mas*] com uma faca. A empresária foi ferida?

Number Experiment: *O engenheiro_{*i*} [*sg*] conhecia muito bem os empregados_{*j*} [*pl*] do empresário_{*k*} [*sg*] que acusou eles_{*i,j,k*} [*pl*] de assassinato. O engenheiro foi acusado?

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THE LEARNABILITY OF THE RESULTATIVE CONSTRUCTION IN ENGLISH L2: A COMPARATIVE STUDY OF TWO FORMS OF THE ACCEPTABILITY JUDGMENT TASK

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The acceptability judgment (AJ) task is a crucial method in experimental syntax. This study compares two forms of the task – Likert-scale and magnitude estimation – in the investigation of the learnability of the English resultative construction for bilinguals of Brazilian Portuguese and English. The English resultative construction is a potentially complex structure for bilinguals of this particular linguistic profile. Not only does its licensing depend on semantic composition of subtle configurations of event structure, but also the surface syntactic structure it maps to is ambiguous with respect to the Portuguese language, in which the same order of constituents links to a different meaning. In Experiment 1, a group of high proficient bilinguals performed an AJ task with a Likert-scale, whereas in Experiment 2, another group of high proficient bilinguals performed an AJ task with the magnitude estimation paradigm. In both experiments the target sentences were grammatical resultatives <One of the classrooms was very dirty, so Desiree swept it clean> and ungrammatical resultatives <Mary had straightened her hair, but her little brother watered it curly>. Our data (TABLE 1) demonstrated that both a traditional Likert-scale judgment task and a magnitude estimation task were equally successful at revealing the learnability of the resultative construction in English L2 by native speakers of Brazilian Portuguese. These findings attest to the psychometric potential of these techniques for the context of bilingualism studies. The magnitude estimation paradigm has been proposed as a technique that qualitatively surpasses Likert-scale AJ tasks, especially because it may be both more powerful to capture acceptability gradience and more readily adequate to parametric statistic tests. However, the results of the present study actually suggest that the Likert-scale AJ task provided a finer distinction of the acceptability difference in question. Thus, the present study fails to depict the alleged promises of the magnitude estimation paradigm for acceptability judgment tasks as truly justifiable.

TABLE 1: Means and standard deviation of the judgment data sets from the two tasks.

Judgment data	Means	SD
Grammatical resultatives – Likert scale	0.70	0.23
Grammatical resultatives – Magnitude Estimation	0.70	0.14
Ungrammatical resultatives – Likert Scale	0.49	0.17
Ungrammatical resultatives – Magnitude Estimation	0.59	0.12

Keywords: likert-scale; magnitude estimation; resultative construction; L2 learnability.

PROSODIC BOUNDARIES ON LEXICAL ACCESS BY SPEAKERS OF BRAZILIAN PORTUGUESE AS L2

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The acquisition of a second language (L2) has served as a theme for the development of research in different areas. Focusing on the role of prosody in lexical access, we have, for instance, the studies of Coughlin & Tremblay (2012; 2011) that point to the use of prosodic cues by speakers / listeners of French as L2 in the identification of lexical items. In the opposite direction, Silva (2010) suggested that acoustic information available in the boundaries of prosodic constituents is not used by L2 Brazilian Portuguese (BP) speakers in situations of syntactic ambiguity. However, although there is evidence that prosodic cues constrain on-line lexical access by BP native speakers (ALVES, 2010), there are no studies showing whether this same pattern occurs with learners of BP as L2. In order to fill this gap, the current study focuses on the role of prosodic boundaries in lexical access in BP as a second language. More specifically, we focus on phonological phrase boundaries (ϕ), which are acoustically characterized in BP by increased duration and variation in intensity and fundamental frequency of the syllables adjacent to the edge of the boundary (Alves, 2010; Silva, 2010). As for the theoretical basis, we assume that speech is organized in hierarchically structured prosodic constituents which interact with the syntactic and the morphological levels (cf. *Prosodic Phonology*; NESPOR & VOGEL, 1986). This possibility of interface between prosodic phrases and other grammatical levels is considered as a facilitator of the language acquisition process, as proposed by the *Prosodic Bootstrapping hypothesis* (MORGAN & DEMUTH, 1996; CHRISTOPHE *et al.*, 1997).

Hence, based on the aforementioned bodies of evidence, we proposed two research questions to guide this study: (1) Do the acoustic cues of phonological phrase boundaries in BP guide phonological lexical access of non-native speakers, dialoguing with the results found by Coughlin & Tremblay (2012; 2011) in French? Or, on the other hand, (2) are speakers/listeners of BP as L2 not guided by such prosodic cues in lexical access, as they are not in syntactic processing as shown by Silva (2010)? In order to answer the questions proposed here, a pilot experiment was developed as an adaptation of a previous study conducted by Alves (2010). Considering that lexical items compete and are inhibited as the phonetic information is being uttered (MCCLELLAND & ELMAN, 1986), we manipulated the effect of temporary local ambiguity (bar vs. barco) superimposed over a phonological phrase boundary and compared with an unambiguous control situation:

(i) Test: A Simone passou o reveillon num **BAR**] ϕ [CUbano de Copacabana (barco)

(ii) Control: A Simone passou o reveillon num **BAR**] ϕ [Famoso de Copacabana (*barf...)

In a word-monitoring task, participants were asked to press a button as quickly as possible as soon as they identified in the audio of a sentence the target word (e.g. "bar") they had previously heard. In order to ensure that participants had both set of words in their mental lexicon (target: BAR vs. competitor: BARCO), a lexical knowledge test was previously applied. Consistently with the evidence found for native speakers of BP, the results we have obtained so far suggest that the lexical access by L2 learners also seems to be guided by the acoustic cues of phonological phrase boundaries, since the effect of local ambiguity was restricted by these boundaries as indicated by the proximity of the mean reaction time values of test (759,4ms.) and control (760,7ms.) sentences. With the testing of more participants, we intend to corroborate these results with statistical analyses (*t*-Student test) and

strengthen our hypothesis that prosodic cues are relevant not only for the initial acquisition process of a native language, but also for the adult processing in first and second languages.

Keywords: Phonological Phrase boundaries; Lexical Access; Bilingual processing.

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BRAZILIAN PORTUGUESE ADULTS USE INTONATIONAL PHRASE BOUNDARY CUES ON SYNTACTIC PROCESSING

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This study investigates the influence of prosody on syntactic processing in Brazilian Portuguese (BP). The prosody-syntax interface has been studied in several languages since early seventies (e.g., Lehiste, 1972; Price, Ostendorf, Shattuck-Hufnagel, & Fong, 1991; Kjelgaard & Speer, 1999; Clifton, Carlson, & Frazier, 2002; Millotte et al. 2007, 2008; DeDe 2010) using different methods. But, there are only a few studies in BP in this domain. In a completion sentence experiment, Silva (2009) showed that BP native speakers identify the lexical category of words inserted in syntactically ambiguous sentences guided by prosodic cues. Using self-paced listening task, Fonseca (2012), Araújo (2012) and Silva (2014) demonstrated that adults exploit phonological and intonational phrase boundary cues to disambiguate temporarily ambiguous sentences. However, this technique has the disadvantage to show segmented sentences and this could disrupt participants' natural processing, although sentences were segmented in prosodic phrases.

Inspired by Stoyneshka, Fodor & Fernandez (2010) work, we conducted two experiments using phoneme restoration effect in a visual word choice task, in order to evaluate whether BP adults use intonational phrase boundary cues on syntactic parsing. Pairs of NP coordination constructions were created, where the subject of the second verb may be a singular NP (1a) or a conjoint NP (1b) (in boldface in the examples):

- (1a) [O juiz intima João e Pedro]IP [e **Lucas** aguarda o resultado final]IP
(The judge intimates João and Pedro and Lucas awaits (for) the final result).
(1b) [O juiz intima João]IP [e **Pedro e Lucas** aguardam o resultado final]IP
(The judge intimates João and Pedro and Lucas await (for) the final result).

An intonational phrase (IP) boundary is placed after Pedro in (1a) and after João in (1b). In both cases, it marks the end of the first clause. The last syllable of the second verb – consequently, its morpho-phonological number agreement – is masked by a noise. Thus, the two sentences differed only in their prosodic contours.

In the first experiment, following Stoyneshka et al. (2010), participants (n=12) were asked to identify, as quickly as possible, which word (*aguarda*-sg or *aguardam*-pl verb suffix, for the examples above) they had heard in the sentence. 89,6% of the preferred words were congruent with the prosodic contour. We also conceived a second experiment in which participants (n=12) were asked to choice between “Pedro e Lucas” and “Lucas”. As they had heard both, we tested whether prosodic contour would facilitate not only the sentence parsing but also temporarily storage information about the second verb subject. Again, their choice was congruent with the prosody on 91,7% of 96 trials. Binomial tests were conducted to ensure that null hypothesis was rejected ($p < .001$). These results showed that participants' decisions were significantly different from chance. A third experiment is being done using minimally informative, flat prosody and we are expecting to find results at chance level.

Taken together the results of the three experiments, we expected to find additional evidence that BP adults use intonational phrase boundary cues on syntactic processing.

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READING FLUENCY IN A GROUP OF SPANISH SPEAKING CHILDREN

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Fluent oral reading has been traditionally measured by the ability to read isolated words with speed and accuracy because rapid and automatic word decoding releases limited working memory resources that become available for comprehension (LaBerge & Samuels, 1974; Posner & Snyder, 1975; Speece & Ritchey, 2005). However, even if automatic word recognition is necessary, it is not sufficient to construct a mental model of a text. In fact recent studies suggest that fluency could be considered as a general indicator of the efficiency of the processes (Fuchs et al., 2001) and have proposed words in context as a more accurate measure (Eason et al., 2013; Klauda & Guthrie, 2008). In fact, reading is a complex process that implies different components such as decoding, lexical access, extraction of syntactic and semantic information from sentences, inferencing (Bashir & Hook, 2009; Perfetti & Stafura, 2014; Pikulski & Chard, 2005).

The current study assessed the relationship between variables in a group (N=317) of Argentinian beginning readers (2nd, 3rd, and 4th grade). A theoretical model about fluency in an orthographically consistent language (Spanish) was developed (Figure 1) and structural equation analytical methods were employed to evaluate within- and cross-grade relations among theoretically relevant variables: RAN, letter naming, word decoding, pseudoword reading, working memory, vocabulary, and comprehension. Results of structural equation modeling analyses suggested the hypothesized model adequately fit the data. The model explained 41%, 29%, 78%, 71%, 39%, and 41% of the variance in comprehension, vocabulary, words in text, isolated word reading, letter naming, and pseudoword reading, respectively. Working memory, vocabulary and words in context were significantly related with comprehension while isolated word decoding showed a negative coefficient. Vocabulary was related with both comprehension and words in text outcomes. RAN was related significantly with pseudoword reading and letter knowledge, but did not predict isolated word reading and words in text. Furthermore, pseudoword reading was related with isolated word recognition and words in text. Mediation tests indicated that pseudoword reading mediated relationships between RAN and both, isolated words reading and words in text. Results are discussed in relation to the relevance of phonological processing in Spanish and interrelation of processes while reading words in context.

Keywords: oral reading; fluency; comprehension; automatic word recognition

THE PROCESSING OF GENDER TRANSPARENT AND GENDER OPAQUE NOUNS IN BRAZILIAN PORTUGUESE: AN EVENT-RELATED BRAIN POTENTIAL STUDY

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A hot debate within the psycholinguistic literature focusing on the processing and mental representation of grammatical gender addresses the issue of whether gender transparent and gender opaque inanimate nouns are processed by distinct or by the same neurocognitive mechanisms. While results of some studies (TUCKER; LAMBERT; RIGALT; SEGALOWITZ, 1968; GOLLAN; FROST, 2002; BATES *et al.*, 1995) suggest that gender transparent forms are computed on the fly and gender opaque forms are retrieved from an associative memory, other results (DESROCHERS *et al.*, 1989; TAFT; MEUNIER, 1998) show a frequency effect for the processing of both categories of nouns, suggesting that, regardless of the noun's form, gender processing is memory-based. Most of these studies have adopted a behavioral paradigm as research method, specially the traditional gender assignment task paradigm. In the present study, we propose to investigate the processing differences (or similarities) between gender transparent and gender opaque forms in Brazilian Portuguese by assessing their electrophysiological effects using a sentence reading task. Event-related brain potentials (ERPs) were recorded from 59 scalp sites as 16 subjects read 256 different sentences with gender transparent and gender opaque nouns as critical words. Sentences were presented one word at a time. Half of the sentences contained a gender agreement incongruence in two conditions: between an article and a noun (**o casa*, **o noite*) and between a noun and an adjective (**casa bonito*, **noite claro*). The other half of the sentences presented were congruent sentences as regards gender agreement in both conditions. Our objective was to see if the difference waves of congruent and incongruent sentences elicit the same or different ERP components for gender transparent and gender opaque forms.

We found a left anterior negativity (LAN) effect as well as a P600 effect for agreement with gender transparent and gender opaque forms in the article-noun condition, but only a P600 effect for the noun-adjective gender agreement condition with gender transparent forms. Results suggest that gender transparent and gender opaque forms are processed by the same neurocognitive mechanisms in the article-noun condition. Further, the presence of a biphasic LAN/P600 indicates that both categories of forms are involved in automatic morphosyntactic agreement processing (cf. MOLINARO; BARBER; CARREIRAS, 2011). On the other hand, the P600 effect found only for the gender transparent forms in the noun-adjective condition indicates that i) there are differences between the processing of article-noun and noun-adjective gender agreement, and that ii) the processing of gender agreement between a noun and an adjective does not involve the recruitment of mechanisms associated with automatic processing.

Keywords: Grammatical Gender; ERP; Brazilian Portuguese.

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THE ACQUISITION OF COORDINATION AND RECURSION OF PPs: HOW TO FARE THE DEVELOPMENT OF THESE COMPUTATIONS?

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Recursion, a computation that is implemented by tucking a constituent into another, is widely recognized as a fundamental cognitive capacity. An interesting discussion tries to define the domain specificity of recursion, that is, if it lies in the underpinnings of language capacity or if it is an integral part of general cognitive resources and is called into action as an external factor. Naturally, an important element in this discussion is the knowledge of when recursion is acquired. This study wants to contribute to this wide investigation by focusing on the acquisition of one recursive instance – that of Prepositional Phrases (PPs) in Brazilian Portuguese.

A significant factor that can shed light onto this discussion is the acquisition of recursion. How and when exactly do children start processing recursion? On one hand it does not seem to be present in children's earliest utterances (ROEPER; SNYDER, 2004, 2005; ROEPER T, 2011). Contrastingly, coordination, appears as an earlier acquisition in language comprehension and production (PÉREZ-LEROUX et al., 2012). Clearly the evaluation of most economical choices can be readily attested in adult language, but how do children acquiring language start implementing these choices?

In order to verify children's processing of recursion, this study will focus on a highly recursive structure: prepositional phrases (PP) in Brazilian Portuguese. The aim here is to contrast PP recursion to DP-PP coordination in acquisition. To do this, this research will try to assess children at the earliest moment that recursion of PPs becomes an available property of their grammar, so that coordination can be compared at this very point.

An oral sentence picture matching test was produced to be applied to sixteen 3 y-o and sixteen 4 y-o children, following a between-subject distribution. Children heard a sentence and had to match it with one of two pictures: one depicted a situation of a coordinated list and the other depicted a situation of embedded nouns hierarchically organized (i.e., recursive condition). The prosodic contour of phrases was controlled, such that the only cue used for interpretation was syntactic: we left no pauses and suppressed all prosodic modulations so that there were no biases that could confound participants.

Using a preferential looking paradigm, participants listened to test sentences either in the recursive or coordination condition (e.g., Recursive condition: "There is a banana in the box on the tray on the chair" or Coordination condition: "There is banana in the box and on the tray and on the chair"). At the same time, children were presented with two images displayed side-by-side on the computer screen. One image was associated with the coordinated representation of the sentence (e.g., three bananas: one placed in the box, another on the tray, and another one on the chair) and the other with the recursive representation of the sentence (e.g., only one banana on top of the three containers).

Then, when listening to the test sentence, children had to point toward the best match. All the while there was a camera filming children's gestures from behind so that the experimenters could have an after-test response control besides the register taken down by the experimenter's assistant during the test.

Taken all together, we found a significant effect of condition $F(1,34) = 6.38, p < .01$; children pointed more toward the recursive image than to the coordination image when they heard the recursive sentences, and vice-versa for the coordination condition. Crucially, we had also an marginal interaction between group and condition, ($F(1,34) = 3.92, p = .055$) indicating that while 4-year-old children pointed more toward the recursive image than toward the coordination image when they heard the test sentences with the recursive structure (and vice-versa for the test sentences with the coordinated structure), 3-year-olds always pointed more toward the coordination image for both conditions (recursive, coordination). Thus, we observe that the proportion of pointing responses toward the recursive image in the recursive condition was above chance for 4-year-olds (60%), but for 3-year-old children the average was below chance (40%), ($t(34) = -3.164, p < .01$). No other effect or interaction reached significance.

The number of recursive layers – two or three – was not a significant factor statistically speaking. Nevertheless since 3 year olds do not appear to use PP recursion meaningfully and they were tested for layers together with 4 year olds, another test focusing on 4 year olds and multiple layers should be applied to verify if their acquired computation seems to be similar to that of adults in this respect.

In term of future perspectives, other linguistic phrases should now be tested in a similar fashion. Another desirable advancement is to use online testing to discriminate between automatic and reasoned upon processes.

Most importantly, since 4 years of age is the moment that PP recursion becomes available, other types of recursive computations should be tested involving linguistic and other cognitive domains so that it is possible fare if recursive structures arising from interface effects derive from more primitive properties than those verified in linguistic computations.

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The role of context and syntax on co-reference

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According to Principle B of Binding Theory, a grammatical construction should have a free pronoun/pro in its domain. In some cases, the pronoun may look for a reference within its sentence or within its context, triggering an ambiguity. In the sentence below, the parser is forced to analyze each NP as its potential antecedent (Kazanina, 2007).

Ana chamou Maria enquanto ela chorava.

Ana called Maria while she was crying.

The present experiment proposes an investigation on the following questions: Once the parser finds an ambiguity, which cues does it follow and which are their impact in on-line sentence processing? Which are the mechanisms interacting with syntax in the coreference resolution? Can the context be observed by on-line measures in coreference processing?

For this purpose, we ran a self-paced reading test in Psyscope B57 with 32 participants. Materials were distributed in four versions of the experiment, in a latin square design, so all participants could be presented to all conditions. Our task consists in an interpretative question in which the subjects choose the antecedent of the verb between its subject and its complement. The independent variables were (i) the type of the pronoun (overt pronoun or pro), and (ii) the semantic bias of the verb (subject bias / no bias). The dependent variables were (a) the reading times for each verb, (b) the response rate and average answers to the task.

1) Pronoun + Semantic bias

a. O frentista ajudou o cliente enquanto ele checava o motor no posto.

The gas attendant helped the client while he was checking the motor.

2) pro + Semantic bias

b. O frentista ajudou o cliente enquanto ____ checava o motor no posto.

The gas attendant helped the client while (pro) was checking the motor.

3) Pronoun + No semantic bias

c. O frentista ajudou o cliente enquanto ele tomava uma coca no posto.

The gas attendant helped the client while he was drinking a coke.

4) pro + No semantic bias

d. O frentista ajudou o cliente enquanto ____ tomava uma coca no posto.

The gas attendant helped the client while (pro) was drinking a coke.

In our predictions, sentences with pronouns would present higher verb reading times than sentences with a pro. We expect no relevant effects of semantic bias on verb RTs. As for the task, we expect a higher response rate for the subject in sentences presenting semantic bias (1 and 2).

On-line data analysis of sentences with a *pro* (2 and 4) presents higher reading times for the verb in sentences with semantic bias (ANOVA; $p < .0015$). No relevant effects were found for sentences with pronouns. Off-line data analysis confirms our hypothesis with the following response rates: (1) 76,4%; (2) 88,9%; (3) 52,8%; (4) 59,7%. The sentences (3) reveals a double ambiguity were the choices are almost equally distributed. The *pro* in Brazilian Portuguese tends to choose subjects as its antecedents (Luegi, Costa & Maia, 2014). The higher response rates for subjects in sentences (2) corroborate these findings. Finally, we conclude that the semantic bias does not present an early effect in the way the pronoun/pro behaves in the first step of coreference processing.

Key words: coreference, semantic bias, sentence processing, context.

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RECURSION THROUGH PROSODY: A PSYCHOLINGUISTIC STUDY

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In this research, based on the minimalist framework of Generative Grammar (CHOMSKY, 1995), we ran forced choice psycholinguistic experiments with auditory input in Brazilian Portuguese (BP), to investigate how prosody maps syntax and its components, such as recursion.

This framework considers the faculty of language as a computational system, composed of two parts: the *Faculty of Language Narrow* – FLN and the *Faculty of Language Broad* – FLB (HAUSER, CHOMSKY, FITCH, 2002). The FLN is believed to be responsible for the syntax and lexical issues, as it is more specialized. The FLB is composed of two interfaces: Sensory-Motor (S-M) and Conceptual-Intentional (C-I), which work with the Phonologic Form (PF) and the Logical Form (LF), respectively. The S-M is responsible for the phonetics and phonology. And the C-I is responsible for the semantics and pragmatics. We intend to find clues about how the information sent from the syntax derivation is read in the S-M interface. More specifically, our goal is to study how the prosody maps syntax when it uses a very complex mechanism, such as recursion (cf. CHOMSKY, 1965; HAUSER, CHOMSKY, FITCH, 2002; NEVINS, PESETSKY, RODRIGUES, 2009; SAUERLAND, 2010; MAIA *et al.*, 2015).

Ladd (cf. LADD, 1986, 1988) proposes a whole organized system to prosody, in which syntax would be properly mapped. He proposes that *Intonational Phrases* (IPs) are distributed into two types: *Major Phrases* (MPs) and *Tone Groups* (TGs). He postulates MPs as bigger IPs, marked by phonetic characteristics. It is composed by TGs. Its frontier is marked by a reset on the intonation. And when it is inside a bigger domine, which he calls *Utterance*, that reset is partial. Thus, partial declination reset is a good clue to identify IPs frontier. When studying recursion through prosody, a perfect recursive structure would not show a partial declination reset, for the lack of a frontier in recursive merge (WAGNER, 2007, 2010).

In previous research, we investigated how the mapping between syntax and prosody work, by running an experiment of reading in Portuguese and in Hebrew (RIBEIRO, 2015). We found that recursive structure, such as “John ate cake [by the table [in the kitchen [at home]]]”, was marked prosodically by the absence of declination reset, and coordinate structure, such as “John ate cake [by the table] and [in the kitchen] and [at home]”, was marked by the occurrence of declination reset, for both languages.

Now, we’re interested in investigate how this relation described above works during comprehension processing. Our hypothesis is that prosody maps syntax, and that it uses occurrence/ absence of declination reset to mark recursion/ coordination (cf. LADD, 1986, 1988; RIBEIRO, 2015); we also assume that declination reset is useful for the parser during sentence processing as a bootstrap (cf. CHRISTOPHE, 1997).

In order to check our hypothesis, we elaborated a psycholinguistic experiment of forced choice with auditory input. Our independent variables are prosodic mark in the intonational curve, which can be: i) Absence of declination reset – prosody to recursive structure (SR), and ii) Occurrence of declination reset – prosody to coordinate structure (CR); and the type of the verb, which can be: i) light verb (verbo de ligação – VL), ii) transitive verb (VT), and iii) intransitive verb (VI). From that 2x3 design we have six conditions: SRVL, SRVT, SRVI, CRVL, CRVT, and CRVI. 10 stimuli for each condition was made. We distributed them in a latin square, which generated 6 lists of stimuli. That is because, as we

are manipulating prosody, the same linear construction has to different prosodies, and we are not interested in letting our participant have access to two different prosody structure to the same linear construction. Each stimulus has three PPs in adjunction position. Examples:

(1) *O cachorro abana o rabo [para o dono [no quintal [em casa]]]*.

‘The dog wags its tail [to his owner [in the yard [at home]]].’

Condition SRVT: absence of declination reset in the intonational curve; transitive verb.

(2) *O cachorro abana o rabo [para o dono] [no quintal] [em casa]*.

‘The dog wags its tail [to his owner] [in the yard] [at home].’

Condition CRVT: occurrence of declination reset in the intonational curve; transitive verb.

We also made up 20 fillers, which were the same for each stimuli list. For the subject task, we elaborated a hundred illustration that were shown to the participant, after the auditory input, by pairs. The participants were previously instructed to choose which of the two pictures most match with the sentence heard right before. Therefore, our dependent variables were response indexes and response time, so that we could evaluate how the intonation interfered in comprehension of the sentences. Our prediction is that the prosody will help the processing of recursive sentences and the processing of coordinate sentences, by displaying different intonational marks to each type of attachment. We are running the experiment with 32 participants.

This experiment is part of a bigger research interested in investigating Recursion within Prosody.

Keywords: Recursion; Generative Grammar; Prepositional Phrase (PP); prosody; syntax.

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INVESTIGATING ANIMACY HIERARCHY: A PSYCHOLINGUISTIC STUDY

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The main topic of this study is the role of animacy in lexical access. We organized an experiment to assess if different animacy categories - human beings, animals, plants (vegetable), and objects - play a role on a lexical decision task. The hypothesis is that an animacy hierarchy measured by the RT's will surface from the results of the online test.

The study seems interesting because animacy is manifested in different domains. Under a biological and neuroscience framework, Lorenz (1949) showed animacy is an instinctive concept in humans and other species (*genetic imprinting*), as also observed in Hinzen and Poeppel (2011), and França and Lage (2013), among others. Further, newborns are known to be able to distinguish between animate beings and inanimate ones and this raises really interesting questions about the fundamental question of nature-nurture and the impact of world knowledge in the cognitive development (Legerstee, M. 1992; Molina et al, 2004).

In Linguistics, animacy is classically considered a semantic property. However, studies show that it is possible to find morphological manifestations caused by the involvement of animacy as a formal feature in syntax. Sedighi (2005) observes this phenomenon in Persian; Osenova (2003), in Bulgarian; Rappaport (2003), in Russian; Bobaljik (2008), in the Hindi-urdu; Sugisaki (2007), in Japanese; Woolford (1999), in Swahili, Ruwund, KiRimi and Maasai.

The hypothesis proposed in this study is that animacy is a syntactic parameter that carries some semantic features that cannot be exhausted in syntax. Thus, subject to different kinds of computation, animacy should impact processing in different ways entailing computations and semantic features that still have to be interpreted by the Conceptual-Intentional Interface (C-I), one of the two performance interfaces (Lage, 2010, 2011; França and Lage, 2013, and Santos, 2013).

In this test we propose a simple lexical decision task of *bare nominals* applied to 30 native speakers of Brazilian Portuguese (BP), undergraduate students of Federal University of Rio de Janeiro (age bracket 18-29). Using an *E-Prime (Psychology Software Tools, Inc.: Solutions for Research, Assessment, and Education)* script we

presented 40 *stimuli* in each condition (human beings, animals, plants (vegetable), and objects), controlled for frequency and size, and 320 distractors (non-words in BP) in pseudo-random order.

The results showed that there was a statistically relevant RT average between Nouns (N) with the feature [+HUMAN] and Nouns with the feature [+ PLANT]/ [+ VEGETABLE]. In other words, our results show that Nouns [+ *human being*] features are more easily processed than Nouns with features of [+plant/vegetable].

Now we are analyzing the same data through other statistical crossings, to verify processing differences between [+ ANIMATE] and [- ANIMATE] Nouns. The ontological speaker expectative in a SVO language, like Portuguese, is that the first Noun of the sentence is [+ ANIMATE] and has the thematic role [AGENT], and the most prototypic [AGENT] has the feature [+ HUMAN]. We are also elaborating a similar experiment, but using the priming technique.

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