Language and Neuroscience Conference

ABSTRACTS

Universidade Federal de Santa Catarina
Florianópolis, Santa Catarina, Brazil
November 29 – December 1, 2012
Universidade Federal de Santa Catarina - UFSC
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Acknowledgments
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Welcome to the Language and Neuroscience Conference

Dear Colleagues,

The Organizing Committee feels proud and happy to welcome you to one of the first conferences on neuroscience of language held in Brazil. We are particularly proud of our keynote speakers, who are pioneers in this field with a worldwide renown and whose insights and presence at this conference will be a stimulus for all of us. We are also proud of the fact that so many more junior participants have been able to join us to show their results and put them up for discussion. We hope that they will find inspiration in this conference to carry on with their good work and make a well-deserved career for themselves. Neurolinguistics is a burgeoning field, touching on many aspects of human nature and of nature in general, but it also faces profound theoretical and philosophical problems and huge technical obstacles and thus needs support from both the physical and the human sciences. It is hoped that this modest conference, and its possible perhaps less modest sequels, will contribute to the success of this new field and will help to marshal the supporting disciplines into greater integration and mutual collaboration in Brazil.

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Language and Neuroscience Conference

PROGRAM

November 29 – Thursday
09:30 – 10:00 – Opening Ceremony (Henrique Fontes Auditorium)
10:00 - 11:00 – Plenary Session (Henrique Fontes Auditorium)
    Peter Hagoort (Max Planck Institute for Psycholinguistics, Nijmegen, NL)
    The language-ready brain
11:00 - 11:30 – Discussion
11:30 - 13:30 – Lunch
13:30 - 15:30 – Paper presentations (Henrique Fontes Audit. & Hassis Room)
15:30 - 16:00 – Coffee break (Hall of CCE Building B)
16:00 - 17:30 – Paper presentations (Henrique Fontes Audit. & Hassis Room)
17:35 – 18:35 – Plenary Session (Henrique Fontes Auditorium)
    Leticia Maria Sicuro Corrêa (Pontifical Catholic University of Rio de Janeiro, Brazil)
    On the relationship between Linguistics, Psycholinguistics and Cognitive Neuroscience in the light of the three-level hypothesis and minimalist assumptions
18:35 – 19:05 – Discussion

November 30 – Friday
09:00 - 10:00 – Plenary Session (Henrique Fontes Auditorium)
    Marta Kutas (University of California, San Diego, USA)
    An electrophysiological look at language: Knowing what happens when, to what degree, and in what context when something is happening almost all the time
10:00 - 10:30 – Discussion
10:30 - 12:00 – Paper presentations (Henrique Fontes Audit. & Hassis Room)
12:00 - 14:00 – Lunch
14:00 - 15:30 – Paper presentations (Henrique Fontes Auditorium)
15:30 - 16:30 – Poster Session (coffee break area)
16:00 - 16:30 – Coffee break (Hall of CCE Building B)
Abstracts

16:30 - 17:30 – Plenary Session (Henrique Fontes Auditorium)
Aniela Improta França (Federal University of Rio de Janeiro, Brazil)
*The N400 in lexical access and in sentence processing*

17:30 - 18:00 – Discussion

20:00 – Conference dinner at Ponta das Caranhas Restaurant

**December 1, Saturday**

09:30 - 11:00 – Paper presentations (Henrique Fontes Auditorium)

11:00 - 12:00 – Plenary Session (Henrique Fontes Auditorium)
Pieter Seuren (Max Planck Institute for Psycholinguistics, Nijmegen, NL)
*The implementation of conceptual structures in the brain: a hopeful perspective*

12:00 - 12:30 – Discussion

12:30 – Closing Ceremony
KEYNOTE LECTURES

The language-ready brain
Thursday, November 29, 10:00 – 11:00, Henrique Fontes Auditorium

Speaker: Peter Hagoort, Max Planck Institute for Psycholinguistics, Nijmegen, NL

Our capacity for language is deeply rooted in our biological make-up. We all share the capacity to acquire language within the first few years of life, without any formalized teaching programme. Despite its complexity we master our native language well before we can lace our shoes or perform simple calculations. This is all based on the universal availability of a language-ready brain. I will discuss the brain organization underlying our remarkable capacity for language. Three components need to be in place for this system to work. These are a Memory (M) component, a Unification (U) component and a Control (C) component. I will present evidence from neuroimaging studies specifying the neurobiological infrastructure of the MUC model. Which brain areas are recruited? Why are they crucial? How is their interplay? These are the sorts of questions that I will address.

On the relationship between Linguistics, Psycholinguistics and Cognitive Neuroscience in the light of the three-level hypothesis and minimalist assumptions
Thursday, November 29, 17:35 – 18:35, Henrique Fontes Auditorium

Speaker: Leticia Maria Sicuro Corrêa, Pontifical Catholic University of Rio de Janeiro, Brazil

The role of Linguistics (the generative enterprise, in particular), psycholinguistics and cognitive neuroscience of language in the development of a theory of human cognition is characterized
in relation to Marr’s three level approach to information processing systems – computational, algorithmic and implementational. Relatively independent research at each level is expected to eventually converge into an integrated theory. Difficulties for such integration and major controversies are pointed out and it is argued that the minimalist program enables a closer relationship between mainstream generative linguistics and psycholinguistics to be established. A model of on-line computation and a procedural model of grammar identification are briefly presented to illustrate this point. Perspectives for further integration between computational/functional models and brain implementation are considered with a particular focus on SLI (Specific Language Impairment).

**An electrophysiological look at language: Knowing what happens when, to what degree, and in what context when something is happening almost all the time**

Friday, November 30, 9:00 – 10:00, Henrique Fontes Auditorium

*Speaker: Marta Kutas, University of California, San Diego, USA*

Acknowledging that language processing is a brain function requires some appreciation of how brains are built (anatomical and functional organization) and how they work – as far as I can tell generally speaking, as it seems that from the brain’s point of view, language is just another input/output which it needs to understand relative its current goals. The brain is neither a linguist nor a psycholinguist, but it can provide data relevant to both – just which input streams belong to the language and which do not, and why – and when and how, and how to put them together to understand, communicate, persuade, etc. The how and the when -- i.e., the mechanisms and dynamics of language processing can be investigated by probing or tasking the brain in ways that lead it to reveal its mysteries via small but systematic changes in electrochemical current flow that penetrates the scalp, can be picked up by electrodes, amplified, stored for safe-keeping, and
analyzed for reliable correlations with stimulus, task, response, and individual variables. I will start with a brief overview of event related brain potentials (ERPs) as dependent measures in studies of language – neurophysiology, methods, analyses, and inferences they allow. Next will come a selective and cursory catalogue of ERP components (especially N400, P3/P600, MMN, LRP) that have proven useful in language research, followed by a few more detailed examples of how ERPs have been used to study language processing – studies that reveal that language is predictive, incremental (albeit not always fully), and intricately intertwined with semantic memory, engages both hemispheres (not always in the same way), that resources (hard constraints in timing and memory) may define competence possibilities not just performance, that it matters when you look at a dynamic system, that the neurobiology of language includes more than just where in the brain things happen, and that though language is very special from the brain’s point of view it’s just another set of noisy, incomplete, ambiguous set of regularities that it needs to understand as appealing, aversive, requiring of some reaction/response or not.

The N400 in lexical access and in sentence processing
Friday, November 30, 16:30 – 17:30, Henrique Fontes Auditorium

Speaker: Aniela Improta França, Federal University of Rio de Janeiro, Brazil

The first event-related brain potential studies of linguistic stimuli appeared in the 1980’s reporting the N400, a negative-going wave, whose enlarged amplitude was believed to indicate frustration of a linguistic expectation during processing: ‘I prefer my coffee with socks’ (Kutas & Hillyard, 1980a). It also became clear from the early studies that this ERP seems to appear in relation to the access of any word, be it congruous or incongruous, surprising or plain, but the wave amplitude would be significantly increased when it is related to a semantically incongruous or unexpected word (Kutas & Hillyard, 1980b). Following the classical N400 tests, a myriad of linguistic
ERP studies started being developed in different natural languages exploring different aspects of the wave up to the years around 2000 (Kutas & Hillyard, 1982, 1983, 1984; Van Petten & Kutas, 1990; Osterhout & Holcomb, 1992; Van Petten, 1993; Federmeier & Kutas, 1999a, b, 2001). There have been reported findings of N400 related both to lexical access and to sentence processing in several experimental protocols. Nowadays, these studies are recognized as a crucial tool in tracking the architecture of language, by testing precise theoretical hypotheses, which reveal a detailed chronology of computations involved in lexical access and in sentence processing (Friederici & Frisch, 2000; Gomes & França, 2008; Pylkkänen, Stringfellow & Marantz, 2002; Pylkkänen & Marantz, 2003; Pylkkänen & McElree, 2007; Lau et al., 2006, 2009). For instance, lexical access studies relate modulations in the N400 to three main factors: (i) lexical frequency, (ii) phonological similarity versus morphological identity: spin-spinach, versus spin-spinning or (iii) semantic relatedness: pork-beef. In contrast, sentence processing studies propose that the N400 is a measure of syntactic integration, which on its turn is modulated by one more factor: (iv) the level of semantic predictability of verb selection. Granted these very different factors cited in the literature, the field of N400, in its state of the art, still lacks a unified reasoning: is the N400 related to the context available for the access of lexical information in the memory or does it relate with syntactic integration efforts that are in action after lexical access (Gomes & França, 2008)? These are the questions this study aims at addressing by testing a set of stimuli distributed into three lexical access and three sentence processing conditions, all of them using the same noun as target. The idea is to verify what is modulating the N400, when the target noun is rejected, accepted or strongly anticipated both for the lexical and for the sentential conditions.
The implementation of conceptual structures in the brain: a hopeful perspective
Saturday, December 1, 11:00 –12:00, Henrique Fontes Auditorium

Speaker: Pieter Seuren, Max Planck Institute for Psycholinguistics, Nijmegen, NL.

The big question in neurolinguistics, both from a theoretical and a practical point of view, is how to “connect” the language system and language use with hardware cerebral structures and processes. We expect each specific language system to be physically implemented in terms of brain structures, and the actual, active and passive, use of language in terms of brain processes. Since both language systems and the actual use of language involve “consciousness” to some extent (even though most of the systems and most of what goes on during speech is below any threshold of possible awareness), this question is closely related to the question of how what we experience as “consciousness” can arise out of physical brain structures and processes. These questions, though of central concern, are far from solved, though we have the feeling that we are gradually closing in on them. Neurolinguistics aims specifically at getting a grip on these questions. One great obstacle in this regard is the simple fact that the discipline of linguistics as a whole has failed to come up with an authoritative, generally accepted theory of the systems underlying language and language use in non-hardware terms, which makes it hard for neurolinguists to know what to look for. A reasonably precise specification of the software underlying language systems and language use would be of great help in this regard. In other words, if linguistics is to “feed” neurolinguistics with useful information to go by, it should strive for maximally formalized statements of linguistic systems and their use in daily speech.
# Abstracts

## PAPER PRESENTATIONS – THURSDAY – NOVEMBER 29 – 13:30-15:30

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<td>L2 processing presents native-like ERP activation after a period of non-exposure</td>
<td>A behavioral and ERP study of verbal mode activation as a function of time</td>
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<td>Lexicalization of motion verbs in English for Portuguese speakers: How might instruction impact on conscious processing and L2 oral production?</td>
<td>Relative clause processing in Chinese and English</td>
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| 16:00 | Henrique Fontes Auditorium | Noun phrases in bimodal bilingual development  
Ronice Quadros, Diane Lillo-Martin, Helen Koulidobrova, Deborah Chen Pichler³ |
| 16:30 |                     | Beyond linear compositionality: The role of roots in the processing of Brazilian Portuguese compound words  
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Augusto Buchweitz |
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Gicele Prebianca, Kyria Finardi, Janaina Weissheimer |
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### Abstracts

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<tr>
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<td>ERP markers of semantic and grammatical statistical information processing in the absence of learning</td>
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<td>11:00</td>
<td>Narrative text processing in right hemisphere brain injury</td>
<td>Talking about concepts of emotion in natural language: preparation for interface research</td>
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<td>11:30</td>
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<td>Henrique Fontes</td>
<td>The interplay of phonology and orthography in visual cognate word recognition: An ERP study</td>
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<td>Montserrat Comesaña, Rosa Sánchez-Casas, Ana Paula Soares, Ana P. Pinheiro, Andréia S. Rauber, Sofia Frade, Isabel Fraga</td>
<td>Neuroanatomical representation of grammatical processing: Specifying Broca’s Area with a fMRI-study</td>
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<td>15:00</td>
<td>Nadja Brandner, Mechthild Grummich</td>
<td>Allocation of cognitive effort in metaphor translation and post-editing: an eye-tracking study</td>
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<td>Arlene Koglin</td>
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**POSTER SESSION – FRIDAY – NOVEMBER 30 – 15:30-16:30**

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<td>Laura M. Baltazar, Mailce Mota</td>
<td>Frequency effects and the processing of verbal morphology by L1 and L2 speakers of English</td>
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<td>Daniela Brito, Mailce Mota</td>
<td>Investigating the relationship between memory systems and distinct levels of L2 proficiency: a psycholinguistic study</td>
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<td>Alvaro Cabana, Camila Zugarramurdi, Juan C. Valle Lisboa</td>
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<td>Ísis Costa, Cristina Moreira, Maria Cristina Cardoso</td>
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<tr>
<td>Raquel Eloísa Eisenkraemer</td>
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<td>Carolina Andrea Gattei, Alejandro Wainselboim, Luis Paris</td>
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<td>Denise Cristina Kluge, Melissa Bettoni</td>
<td>The relationship between working memory capacity and speech perception: testing the validity of a categorical discrimination test</td>
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<td>Procura-PALavras (P-PAL): A Web application for a new European Portuguese lexical database</td>
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<td>Camila Zugarramurdi, Álvaro Cabana, Juan Carlos Valle Lisboa</td>
<td>Pragmatic priming in Spanish</td>
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### PAPER PRESENTATIONS – SATURDAY – DECEMBER 01 – 9:30-11:00

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<td>Childhood bilingualism: An investigation about inhibitory control</td>
<td>Inhibitory control in multilinguals: a longitudinal study</td>
<td>Is sameness a primitive function in language processing?</td>
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<td>Luciana Brentano, Ingrid Finger, Ana Areas da Luz Fontes</td>
<td>Marta Bandeira, Márcia Zimmer</td>
<td>Juan Valle-Lisboa</td>
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13:30 – Crossing morphological violations of agreement and word emotionality using the ERP technique

Isabel Fraga, Marcos Díaz-Lago, Carlos Acuña-Fariña
Universidade de Santiago de Compostela, Spain
isabel.fraga@usc.es, marcos.diaz.lago@gmail.com, carlos.acuna.farina@usc.es

In Fraga, Piñeiro, Acuña-Fariña, Redondo, and García-Orza, (2012) the authors manipulated the emotional dimension (valence and arousal) of the nouns in a complex noun phrase (NP) that precedes a relative clause (RC), as in the classic ambiguity Someone shot the servant of the actress who was on the balcony. The aim was to see whether nouns such as orgy or genocide affect the well-established high adjunction preference of Spanish (to servant, instead of actress, in the above example; Acuña, Fraga, García-Orza, & Piñeiro, 2009; Carreiras & Clifton, 1999; Cuetos & Mitchell, 1988). In this series of completion studies the authors found that the RC is preferably linked to NP2, the lower noun, whenever this is both pleasant and high in arousal. Previous studies using ERPs have provided electrophysiological evidence of the brain’s sensitivity to gender agreement violations during sentence comprehension (Barber & Carreiras, 2005; Hagoort, Brown, & Groothusen, 1993; Osterhout & Mobley, 1995; Wicha, Bates, Moreno, & Kutas, 2003; Wicha, Moreno, & Kutas, 2005), as well as of the processing differentiality of emotional words in isolation (Herbert, Kissler, Junghoefer, Peyk, & Rockstroh, 2006). Given this background, it seemed possible that the emotional dimension of nominal
antecedents might also modulate the amplitude of the P600 component in a syntactic comprehension task, so the authors ran an ERP study similar to that of Carreiras et al. (2004), mixing emotional and neutral words. However, the Carreiras et al. results were replicated, as well as the preference for NP1 that has typically been observed in Spanish both in off-line and on-line measures. Thus, contrary to what was found in the completion studies, the emotional dimension of the nouns did not seem to change attachment decisions. In a further attempt to check a possible influence of the emotional content of words on syntactic processes, we carried out a new ERP study in which gender agreement was manipulated. Four experimental conditions were created: neutral gender agreement, neutral gender disagreement, emotional gender agreement, and emotional gender disagreement, all words having been selected from standardized databases (Davis & Perea, 2005; Ferré, Guasch, Moldovan, & Sánchez-Casas, 2012; Redondo, Fraga, Padrón, & Comesaña, 2007). Overall, the results showed an early component (P100/N100) elicited by the emotional conditions (both grammatical and ungrammatical), a left anterior negativity (LAN) sensitive to the grammaticality of the sentences (in the ungrammatical conditions), and a late positivity (P600) which was sensitive to emotional words and to grammaticality, but with no interaction between these two factors.

14:00 – L2 processing presents native-like ERP activation after a period of non-exposure

Ingrid Finger¹, Kara Morgan-Short², Sarah Grey³, Michael T. Ullman³
¹Federal University of Rio Grande do Sul, Brazil, ²University of Illinois at Chicago, USA, ³Georgetown University, USA
finger.ingrid@gmail.com, karams@uic.edu, seg43@hoyamail.georgetown.edu, michael@georgetown.edu

The present study examines whether the neurocognition of adult-learned second language (L2) changes after a substantial period of non-exposure
to the language. The experiment was structured as a follow up to a recent eventrelated potential (ERP) study of an artificial language, in which subjects were trained to actually speak and understand Brocanto2, a language which refers to pieces and moves of a chess-like computer game and is a variant of another artificial language (Brocanto) which, when learned to high proficiency, shows L1-like brain patterns. In the initial study, subjects received either explicit (classroom-like) or implicit (immersion-like) training in the language, and underwent behavioral and ERP testing at both low and high proficiency. In this follow-up study, a subset of the subjects (19 of 30) returned 3 to 6 months later. After a brief warm-up practice period, subjects again underwent behavioral and ERP testing. Behaviorally, d’ scores revealed no differences between the two training groups or between the two test sessions, showing that proficiency did not decrease during this delay. In contrast, the ERP patterns in response to phrase-structure violations differed between high proficiency (post-treatment) and 3-6 months later (post-delay), revealing an increase in native-like neural processing of syntax, as evidenced by earlier, more reliable, and more left-lateralized anterior negativities, and more robust P600s. Moreover, both the explicitly and implicitly trained groups showed increased native-like ERP patterns over the delay, indicating that such changes can hold independently of L2 training type. The results demonstrate that substantial periods with no L2 exposure are not necessarily detrimental. Rather, benefits may ensue from such periods of time even when there is no L2 exposure. Interestingly, both before and after the delay the implicitly trained group showed more native-like processing than the explicitly trained group, indicating that type of training also affects the attainment of native-like processing in the brain. Overall, the findings may be largely explained by a combination of forgetting and consolidation in declarative and procedural memory, on which L2 grammar learning appears to depend. The study has a range of implications, and suggests a research program with potentially important consequences for second language acquisition and related fields.
14:30 – A behavioral and ERP study of verbal mode activation as a function of time

Cecilia Imperioso¹, Silvano Zanutto¹, Virginia Jaichenco², Alejandro Wainselboim¹

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Two basic questions in psycholinguistic research are i) which information is activated after a linguistic stimulus is presented, and ii) how long is this information activated or present in working memory. In this study we aimed to analyze these two questions regarding a specific feature of Spanish verbs that had not been previously studied: verbal mode. To do so we carried out three lexical decision experiments with priming. In each of them 100 relevant prime-target pairs and 100 prime-target fillers were presented in pseudo-random order. All prime and relevant target words were Spanish verbs in 3rd person plural form, while 100 target non-words were fillers obtained by changing one or two initial letters of existing Spanish verbs. 50 of the relevant prime-target pairs shared all verbal syntactic information (Same condition), while the other 50 differed only in verbal mode between prime and target (Different condition). Primes and targets were matched in mean frequency of use and length, and shared no semantic or formal relation. Each trial consisted of a 3000 ms resting period followed by prime presentation (200 ms); inter-stimulus interval (Exp 1: 100; Exp 2: 250 ms; Exp 3: 450 ms) and target presentation (until response). Participants were instructed to respond as quickly as possible whether target stimuli were real Spanish words or not. Electroencephalographic (EEG) recordings were gathered during the task. EEG measures have proven to be a valuable tool to study the fast dynamic changes that underlie cognitive processing, because of their high
temporal resolution. In addition, EEG recordings can be decomposed into oscillatory components, which allow to analyze the signal as a function of time and frequency. Increases (event related synchronization, ERS) and decreases (event related desynchronization, ERD) in frequency band power after stimulus presentation are considered a measure of the degree of synchronized neural firing over the analyzed regions. Results showed that the percentage of correct responses increased and reaction time decreased when prime and target words shared the same verbal mode. Furthermore, the magnitude of the priming effect was modulated by the inter-stimulus interval presented during the experiment, with a maximum value in Exp 2. Global mean potential value measured 50-250 ms after target presentation increased in the Same compared to the Different condition. Similarly to behavioral results, the magnitude of the effect was modulated by the inter-stimulus interval used, with a maximum in Exp 2. Finally, a significant ERS of theta and alpha rhythms was found early after prime presentation, while a significant ERD of these same frequencies was found approximately 400 to 1000 ms after target presentation. In this period a greater ERD was obtained in the Same compared to the Different condition. These differences are similar to those seen during visual n-back tasks in which a stronger alpha ERD is found after presentation of targets compared to non-targets. Again, this measure was modulated as a function of the inter-stimulus interval, with a maximum value in Exp 2. Therefore, both behavioral and EEG measures coincided to show that in the present experiments verbal mode seemed to attain a maximum value within 350 ms after prime presentation.
Here we investigated synchronous speech (also known as ‘choral speech’), the ability of two or more people to read or recite aloud a known text simultaneously. We placed participants in an MRI scanner (1.5T Siemens Avanto, 32-channel head coil) equipped with a custom-built system allowing two-way, low-latency vocal communication between the participant in the scanner bore and an unseen experimenter in the control room. Visually-presented sentences were preceded by a prompt to (i) speak synchronously with the experimenter, (ii) speak the sentence without the experimenter, (iii) listen to the experimenter read the sentence, (iv) read the sentence aloud while a different sentence was spoken by the experimenter, or (v) rest. The synchronous speech condition comprised twice as many trials as the other conditions - half of these required the participant to synchronize live with the experimenter, while the other half used recorded speech from the same experimenter. However, the participant was not informed of this manipulation. Functional magnetic resonance imaging data were collected using a dual echo, sparse clustered EPI pulse sequence with a 15-second ITI that included a 6-second silent period to allow speech production and the presentation of auditory stimuli in quiet. The degree of inter-speaker synchrony was computed post-hoc, using Dynamic Time Warping to perform trial-wise time alignment of recordings from the two talkers. Early behavioral data confirm Cummins’s (2001) finding that speakers can synchronize closely with a recording, but even more closely to a live person who can also adapt their timing. The neuroimaging results show that synchronous speaking recruits temporal regions, Rolandic operculum, and cerebellum, with subregions of this network showing differential modulation depending on the degree of synchrony achieved in the behavioural task.
13:30 – Losing a language in childhood: a longitudinal case study on language attrition

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This paper is based upon a longitudinal study of language attrition in a bilingual (female) child, who grew up in Germany, and moved to Portugal at the age of 9. Before the return to her parent’s home land, the informant was highly proficient in German, the language of environment, but the exposure to German was drastically reduced after arriving in Portugal. The present study aims to analyse effects of language loss in the language which was no longer used on a daily basis. Data collection started three weeks after her immersion in the Portuguese setting and ended 18 months later, at a point when the informant was totally integrated in the «new» Portuguese environment and refused to speak German. The data base consists of spontaneous and elicited oral production, collected in individual sessions, where the informant and the researcher had conversations about topics focused mainly on the differences between Germany and Portugal. The informant was also asked to retell a story and comment on pictures. The oral data was recorded, transcribed and coded for analysis, which focused especially on word order in German. Results show first effects of language attrition after five months of reduced exposure to German, namely ungrammatical subject omissions and non-required verb-subject inversion. First effects of attrition regarding verb placement, i.e. V2 and OV word order patterns, emerged 8 months after the informant experienced the break with the German-dominant setting. After 13 months the girl was still able to produce sentences with grammatical word order, but she produced also high rates of
ungrammatical sentences. Finally, 18 months later the informant showed severe word retrieval difficulties and was unable to produce complete sentences in German. The findings, thus, confirm the conclusions of other studies on child language attrition, which suggest that there is a critical period for language retention in childhood (Flores, 2010; Hyltenstam et al., 2009; Kuhberg, 1992; Pallier et al., 2003). If a bilingual child loses the contact with one language during this period (before puberty), s/he may forget this language rapidly. Additionally the results of the present study show that the decline of linguistic knowledge may happen in a very limited period of time, i.e. in a time span of 18 months only.

14:00 – Lexicalization of motion verbs in English for Portuguese speakers: How might instruction impact on conscious processing and L2 oral production?

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Languages differ typologically in how space and motion events are expressed linguistically. English, a satellite-framed language, encodes manner of motion in the verb and indicates path of motion on satellite phrases. Portuguese, a verb-framed language, encodes path, and only rarely manner of motion in the verb (Negueruela, 2004; Slobin, 1996; Talm, 1985, 2000). Following the assumptions of cognitive semantics (Talm, 1985, 2000), this paper reports the results of a preliminary study on the effects of instruction on the lexicalization patterns of motion verbs in English for Portuguese speakers learning English as a second language (L2). The study sought to investigate whether there is relationship between noticing (Schmidt, 1990, 1995, 2001) features of English motion verbs and oral production of such verbs. It also aimed at finding whether overt instruction on the lexicalization of motion verbs in English culminates
in any development of the participants’ oral performance. Speakers of
different kinds of language (satellite-framed and verb-framed languages)
have different ways to express themselves and convey meaning when it
comes to motion events (Talmy, 1985). Research has shown that even very
proficient L2 speakers have difficulty in shifting their thinking-for-speaking
patterns when conveying the idea of movement (Negueruela, 2004; Slobin,
1996). Considering the assumptions that conscious processing plays an
important role in second language acquisition (Schmidt, 1990, 1995, 2001)
and that individuals who feature higher levels of noticing perform better
in oral tasks (Bergsleithner, 2007; Mota, 2000), the present study aimed
at investigating whether there is correlation between the participants’
awareness raising over the typological difference of how languages express
motion events and spatial description, and the emergence of these patterns
in their oral production. The experiment was conducted in a Binational
Center, located in DF, with a group of intermediate level learners of English
as an L2. The research design consisted of four phases: (1) a pretest phase
aimed at measuring noticing of the lexicalization pattern through an oral
protocol, and accuracy and lexical choice in oral production through a
narrative of a sequence of images containing the idea of movement; (2)
an instructional treatment phase in which participants received a Planned
Form-Focused Instruction (FFI) (Ellis, 2001) on the lexicalization pattern
for motion verbs in English; (3) an immediate posttest phase aimed at
measuring noticing through an oral protocol, and accuracy and lexical
choice in oral production through a narrative right after treatment; and
(4) a delayed posttest phase aimed at measuring noticing and assessing
the participants’ accuracy and lexical choice in oral production, two
weeks after treatment. The results suggest that participants who present
higher levels of noticing had better oral performance regarding the use of
the L2 pattern of lexicalization of motion verbs and those with lower levels
of noticing benefited more from the instructional intervention, since they
showed significant improvement in oral production after treatment.
14:30 – Relative clause processing in Chinese and English

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The processing of relative clauses (RC) has been an important focus of research on a multitude of languages in linguistics and psychology over the past two decades because such clauses, with their structural complexity and morpho-syntactical differences among diverse languages, provide rich and unique data for linguistic analyses from typological studies investigating language universals to neuro-linguistic experiments examining memory mechanism in language comprehension. The present study investigates the well-documented, controversies notwithstanding, processing asymmetry (c.f., Gibson, 2000) between subject and object RCs and uncovers important factors underlying such asymmetry. While most prior RC research focused on studies of sentences or reading comprehension of a particular language, the present analysis is based on data drawn from oral and written discourse in Chinese and English. By examining the occurrence and distribution of relative clauses in discourse between the two historically unrelated and morpho-syntactically very different languages, the study aims to explore how cognitive operations conspire with semantic and discourse-pragmatic factors to generate the often skewed distribution of syntactic types of RCs in discourse, as observed in many languages. The study argues that RC construction is used mainly as a grounding and reference-tracking device in discourse (c.f., Givón, 1993). In deploying a RC to modify a given NP, speakers are perpetually faced with decisions on when to ground a particular referent and what particular RC to use for the hearer to uniquely identify the referent in discourse processing. This decision-making process is determined largely by the interaction of several factors: speakers’ own cognitive demands during discourse production and their assumptions about the hearers’ state of knowledge on the referent of the head NP under
discussion, the semantic properties of the head NP, and the discourse and situational context in which the entire construction occurs. The study explores further each of these factors and how they operate and interact to warrant the use of a given RC that serves a particular discourse function. The study demonstrates that relative-clause distributions between Chinese and English discourse are remarkably similar: While RCs modifying subject head NPs are used almost as frequently as those modifying object NPs, subject RCs are used much more frequently than object RCs; while subject RCs modifying subject head NPs are by far the most frequently used RC construction in discourse, object RCs modifying subject head NPs are extremely rare. Although the asymmetry between subject RCs and object RCs, as found in prior research, do exist in both languages, it is much more complex than a clause-level phenomenon but due largely to the cognitive advantage of subject RC processing and the semantic and discourse-pragmatic properties of the head NP that subject RCs modify. Furthermore, the study investigates the similarities and differences of RCs produced between spoken and written discourse in both languages, and explores language-universal as well as language-specific characteristics of RCs in discourse production.

**November 29 – Thursday**
**Paper presentations – 16:00-17:30 – Auditorium**

**16:00 – Noun Phrases in bimodal bilingual development**

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For child and adult bilinguals, both languages are always activated (Kroll et al., 2006), and therefore, the languages may interact with each other
in numerous ways, including the phenomena known as cross-language influence and code-switching. We argue that these phenomena are essentially non-distinct, and simply fall out from the architecture of the language faculty as instances of what we call ‘language synthesis’. We start with a modified version of the ‘minimalist friendly’ view of code-switching by MacSwan (2000). On this view, bilinguals have an additional set of vocabulary items with their associated feature values. Code-switching results from spelling-out items from both vocabularies, permitted as long as all featural specifications are satisfied. It is also possible to generate a ‘structure’ from one language using ‘words’ drawn from the other vocabulary, or insert a null functional item from Language_x in an utterance which otherwise consists of words from Language_y (Cantone, 2007). Despite claims that these language synthesis phenomena are purely developmental and are eventually outgrown (Hulk & Müller, 2000), they persist in certain adult contexts (González-Vilbazo & López, in press). We support this view of language synthesis by examining Noun Phrases produced by bimodal bilinguals, children simultaneously acquiring a sign language (American Sign Language (ASL) or Brazilian Sign Language (Libras)) and a spoken language (English or Brazilian Portuguese (BP)). We examine the use of determiners in the spoken languages and the ordering of nouns and adjectives in both the spoken and sign languages, including longitudinal spontaneous production data from four children ages 1;06-4;09, and a larger group of 4- to 7-year-olds in elicited production. Libras and ASL are different from BP and English (respectively) in not requiring an overt determiner in most NP contexts. Despite the prevalence of determiners in the spoken languages, two-year-old children frequently omit them in required contexts (Lopes, 2006; Lleó & Demuth, 1999). If the bimodal bilingual children in our study are using determinerless structures from their signed languages in their spoken languages, it might be expected that they would persist in the non-target use of noun phrases with article omission past the age at which such usage disappears for monolingual children. Indeed, this is what we found, with determiner omission continuing into the fifth year in the children and also in adult code-blending contexts. A different finding emerged from our study of adjective placement. Libras and English are strict in the placement
of adjectives after or before nouns, respectively. PB occasionally permits prenominal adjectives, and ASL more freely allows postnominal ones. Thus, if the children show synthesis in this domain, we might expect to see prenominal adjectives in Libras, and more likely, postnominal ones in English. However, we did not find this usage, even though the US children did occasionally use post-nominal adjectives (appropriately) in their ASL. This finding supports the conclusion of Cantone and MacSwan (2009) that word order of noun/adjective sequences in code-switching is determined by the language of the adjective, if our code-synthesis model is adopted.

**16:30 – Beyond linear compositionality: The role of roots in the processing of Brazilian Portuguese compound words**

Joyse Medeiros¹, Daniel Brandão¹, José Henrique Góis¹, Aniela França², Sidarta Ribeiro¹

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Identifying the minimum building blocks that constitute language expressions that are computed, processed and uttered, to these days, remains a major question in linguistic research (Chomsky, 2000). How do we pair up sensory information (acoustic, visual or tactile) to the representations stored in the lexicon? Is the way we access words influenced by how the lexicon is organized? Full parsing models suggest that, at the time of lexical access, the words are decomposed into smaller units, namely morphemes. The central assumption of these models is that words are stored in our memory in the form of minimal significant units. Fiorentino and Poeppel (2007) showed with a lexical decision test, that compound words elicited shorter reaction times and were correctly evaluated as real words at higher rates than single words (i.e., simple words provoked more errors). They also found that pseudoword foils were correctly rejected in greater
proportion. In a priming test with Brazilian Portuguese simple words, Garcia et al (2012) found that primes which shared the same morphological identity (ie, words that have the same roots) with their targets facilitated recognition. These results indicate that there are qualitative differences in the processing of items whose morphological structure is more complex, and that there is a role for morphological decomposition even in familiar and frequent words as it is proposed by models of full decomposition. Within this line of investigation, compound words may contribute enormously for their specific dual nature: they have an atomic meaning and yet they can be segmentable like phrases, “reflecting both the properties of linguistic representation in the mind and grammatical processing” (Libben, 2006). In this present work, we investigate the lexical access of compound words of Brazilian Portuguese (BP). Our first objective is to verify, with a lexical decision test, whether there is any psychologically relevant and empirically measurable difference in how we handle simple and compound words in BP. We believe that this information may shed some light on how the mind represents these different categories of words. Ultimately, we analyze if superficial differences on the structure of the languages influence processing, which might help in discriminating what is innate versus learned in the language faculty.

17:00 – Commonalities in the bilingual neural representation of the meaning of words

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Brain imaging has shown that similarity in bilingual brain activation for language processes in different languages increases generally as a function of language skill. In the study, we hypothesized that the semantic neural representations of nouns would have a high level of cross-language commonality for the proficient bilinguals investigated. The goal of the
study was to identify the neural representation of a noun's meaning in one language based on the neural representation of that same noun in another language. Machine learning methods were used to train classifiers to identify which individual noun bilingual participants were thinking about in one language based solely on their brain activation in the other language. The study shows reliable pattern-based classification accuracies for the classification of brain activity for nouns across languages. This neural representation would help reveal a semantically-rich mental content of the representation in either language. In other words, the pattern-based classification would reveal that the neural representation can be related to the semantic properties of the nouns (e.g. their purpose, how people interact with them).

November 29 – Thursday
Paper presentations – 16:00-17:30 – Hassis Room

16:00 – Working memory capacity across languages and proficiency levels

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This study investigates whether working memory capacity varies across languages and in the course of L2 speech proficiency levels. Following suggestions in Finardi and Weissheimer (2009) and Prebianca (2010), who found that working memory capacity varied as a function of L2 speech proficiency, the present study assessed three proficiency levels (elementary, intermediate and advanced) and two languages (L1 and L2). Departing from Information Processing Theory (for example, McLaughlin & Heredia, 1996), L2 speaking is conceptualized as a
complex skill requiring both automatic and controlled processes working in tandem for its execution (Fortkamp, 2000; Shiffrin & Schneider, 1977). Controlled processes require attention, which is assumed to be limited in working memory. Limitations in working memory constrain the processes involved in L1 speech production (Daneman & Green, 1986; Daneman, 1991), L2 speech production (Finardi & Prebianca, 2006; Prebianca, 2007; Fortkamp, 2000), and L2 speech development (Bergsleithner, 2007; Finardi & Weissheimer, 2009; Weissheimer & Mota, 2009; Weissheimer, 2011; Finardi & Mota, 2012). Two working memory tests were used, one in the L1 and another in the L2, both in the speaking mode. Sixty-three adult learners of English as a foreign language participated in the study: 22 elementary, 19 intermediate and 22 advanced learners. Preliminary results of T-tests and correlations corroborate Prebianca (2010) and Finardi and Weissheimer (2009) suggesting that working memory capacity measured with a speaking span test in L2 seems to conflate proficiency level and working memory capacity.

16:30 – Looking for computational cost in sentence planning: An eye movements study

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Griffin and Bock (2000) monitored speakers’ eye movement as they described pictures of simple events and found that they gazed at a certain object immediately before mentioning it. After a short period of event apprehension speakers tended to fixate more on referents that will be mentioned first (N1) prior to speech onset, and then on those that will be mentioned in second place (N2). As the same pattern emerged for
active and for passive sentences, G&B concluded that the eyes anticipated
the order of mention regardless of sentence structure. However, as the
grammatical subject always comes first in English, the Active-Passive
contrast is not appropriate for distinguishing if the eye movements are
tapping into linear or structural order planning processes. Drawing on
the relative flexibility of Spanish regarding word order, we designed
an experiment aimed at distinguishing N1 from grammatical subject
(linear vs. structural order) by opposing Passive sentences to Clitic Left
Dislocated (CLLD) sentences, where the grammatical object is placed
at the beginning of the sentence. Furthermore, the Active vs. Passive/
CLLD contrast allowed for separating not only conceptual order from
linear order but also the presence of movement effects in the syntactic
derivation. Using a picture description task in which the three different
sentence structures were elicited, we intended to determine the influence
of these variables on speech latencies and eye movements during sentence
planning. The results showed that, as observed by G&B, a gist-extraction
stage, during which the relation between entities involved in the event
is assessed, precedes the formulation. After this apprehension period,
participants gazed at a certain object immediately before mentioning it,
irrespective of its conceptual role and its structural position. This confirms
G&B’s findings according to which eye movements reflect linear order of
constituents. In other words, eye movements seem to be closely related
to lexical access and seem to reflect positional processes of sentence
formulation. However, results also showed that more gazing time is spent
on N1 referents for passive and CLLD sentences, where the linear order
is derived by movement, than for active sentences. This fact suggests that
lexical access is not the only process being carried out during the gaze
to the first constituent. The difference between conditions indicates that
eye-movements may also reflect an additional computational cost for
structures derived by movement.
This study investigates the consequences of code-switching on the bilingual brain. Code-switching, the use of another language during speech production, demands a greater executive and attentional control, leading to strong effects on nonverbal tasks as well. Studies on bilingualism have proved that bilinguals tend to show better scores on tasks which measure their executive functions – cognitive processes such as planning, working memory, attention, problem solving, inhibition, mental flexibility, and initiation and monitoring of actions. The bilingual advantage has been found in different age groups in what regards some executive functions (Bialystok et al., 2004; Bialystok, Craik & Freedman, 2007; Bialystok, Craik & Luk, 2008; Martin-Rhee & Bialystok, 2008), but data involving young adults are still controversial. Therefore, we decided to repeat some of the experiments made previously with other types of population focusing on inhibitory and attentional control (alerting, orienting and executive control networks). For that, we interviewed and tested businesspeople between 30-49 years old, highly educated, who are naturally faced with strong cognitive demands in their daily lives, constantly having to solve problems by making important decisions and taking great responsibility for them, and therefore would profit considerably from enhanced executive functions. It is important to highlight the fact that no previous work has addressed such population in this regard. Our study contained 24 participants (12 monolinguals and 12 bilinguals) occupying executive positions in different kinds of companies in Porto Alegre, Canoas, São Leopoldo, Portão, Pelotas and Rio Grande, in the state of Rio Grande do Sul, Brazil. They were tested in two non-verbal cognitive tasks, the Simon Task (Simon & Wolf, 1963) and the Attentional Network Task (ANT) (Fan
et al., 2002). In both tasks, participants are supposed to ignore irrelevant stimuli and both reaction time and levels of accuracy are measured, as well as the Simon Effect, Alerting, Orienting and Conflict Effects. We expected to find better scores for bilingual businesspeople. However, the results found revealed no significant statistical differences between the groups, corroborating some previous studies with the same age group. Furthermore, our findings lead us to consider that variables such as level of education and type of professional activity might interfere with the bilingual advantage.

November 30 – Friday
Paper Presentations – 10:30-12:00 – Auditorium

10:30 – ERP markers of semantic and grammatical statistical information processing in the absence of learning

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First language acquisition occurs by mere exposure to the linguistic context. During this process, infants must solve among other problems, two basic issues: i) infer word meanings by pairing specific aspects of their perceptual experience with particular segments of the concurrent linguistic input (semantics); and ii) acquire the combinatorial rules that allow to convey a coherent message within that language (grammar). The ability to solve these issues requires to statistically analyze cross-situational information,
i.e. to associate information that is concurrent along multiple events or situations. Experimentally, it has been shown that adults are able to infer new noun meanings by cross-situational pairings of images and auditory non-words (Yu & Smith, 2007). Similarly, we analyzed whether adults are also able to infer new verbal meanings by associating concurrent visual and formal information (Lopes da Cunha et al., 2010). In this experiment training consisted of 70 different visual scenes presented on a computer screen (two geometrical figures, one static and the other performing one of 6 possible movements). A sentence describing the scene in an artificial language was presented audio-visually in simultaneous. Participants had to learn which word denoted each movement. During testing 80 new scenes were shown, 40 of them presented a mismatch between the movement and the presented “verb”. Subjects decided on-line whether each sentence correctly described the scene. Simultaneous EEG recordings were obtained in this stage. Most subjects responded significantly above chance level during testing. In those who learned, the appearance of a mismatch between verb and referent elicited an N400-like wave. Thus, under controlled experimental conditions, subjects infer new verbal meanings by conscious cross-situational pairing of images and audiovisual non-words, if they are given the explicit instruction to learn the presented terms. In a second experiment we studied if new verbal meanings could be learned in the absence of intention to acquire regularities between linguistic and contextual information. 22 right-handed healthy adults volunteered for the experiment. The training protocol followed that of Lopes da Cunha et al 2010, but participants were told not to pay attention to the sentences and concentrate on classifying the movements they saw as horizontal or non-horizontal. During the test stage (as in Lopes da Cunha et al. 2010), subjects were told to decide on-line whether each sentence correctly described the scene. Simultaneous EEG recordings were obtained in this stage. Results showed that participants were completely unable to classify the sentences as correct or not. Nevertheless, the appearance of a mismatch between verb and referent elicited an ELAN-like potential. Thus, although no behavioral evidence could be found of new semantic knowledge, at
the neurobiological level evidence was found that an association was achieved between movements and their corresponding terms. Finally, in a third experiment we eliminated the semantic (visual) referent and asked participants to learn the combinatorial rules of the artificial grammar. During testing, subjects were asked to classify as grammatical or ungrammatical 160 new sentences that followed or not the trained combinatorial rules. Results showed that certain sequence types elicited a late positive component which was modulated by different factors in two distinct time windows. In an earlier window, the component was higher for sequences which had a low or null probability of occurrence during training, while in a later window, the component was higher for incorrect than correct sequences. Although the late window effect was absent in subjects that were unable to learn the trained rules, these subjects presented the earlier positive component that was sensitive to the probability of occurrence during training. Thus, even in the absence of knowledge, neurobiological evidence was found showing that statistical information was acquired of the possible combinations between items.

11:00 – Narrative text processing in right hemisphere brain injury

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Advances in neuroscience have allowed us a more refined study of language processing, and hemispheric specialization. In relation to text processing, recent research (Dehaene et al, 1997; Mazoyer et al, 1993; Tomitch et al., 2004; Loaches, 2008) has indicated a greater involvement of the left hemisphere (LH), associated with text integration, which means, the understanding of macrostructure, and the creation of an appropriate situational model to the text; whereas other studies (St. George et al., 1999; Robertson et al., 2000; Hough, 1990; Joanette et al., 1986) focus on a more
effective engagement of the right hemisphere (RH) in this processing. Considering the understanding of the microstructure, it seems to be consensual that the LH is largely responsible for it (Ellis et al., 2005; Crinion et al., 2006; Hough, 1990; Joanette et al., 1986). This research aims to determine how right hemisphere brain-damaged (RHBD) participants process narrative texts in the three levels of comprehension: micro, macro and situational model. We bring the following questions: how do an individual with RHBD process a narrative text? Is there any difference between this individual and the control group concerning the reading comprehension of micro, macro and mental model of a narrative? Is there any relation between a good performance in tasks of memory and executive functions and higher accuracy in narrative comprehension? We are searching for answers to these questions through the implementation of this study. A control group and a RHBD case individual participated in the study. These participants underwent a neuropsychological evaluation, followed by linguistics tests. The results support the view that the RH has a special participation in the understanding of the macrostructure and the situational model of the texts. This research provided data to extend our understanding of the language pathology functioning, its relation to the cerebral hemispheres, as well as their interrelationship with other cognitive processes of working, episodic memory, and executive functions.

11:30 - Does mental lexicon exist?

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One of the central components of language processing and most intriguing to researchers is the mental lexicon. The term was used for the first time by Ann Triesman in 1961 and we still do not have clear answers to how it is structured and how much information it contains, or even if
there is something to be called a mental lexicon. For some time, mental lexicon has been compared to a mental dictionary, since both store word knowledge; however, they are surely different in structure and quantity/quality of information. Neuroimaging studies have also tried to bring contributions to these questions. Some researchers believe that there are many lexicons, one for each level of stored information (Ullman, 2007): orthographic, phonological, semantic and syntactic lexicon. Another group of researchers (McClelland, Rogers, 2003, Seidenberg, 1997, etc.) postulates the existence of only one lexicon where all information levels are integrated. Recently, a new audacious proposal has been done by Elman (2009), the inexistence of a mental lexicon. In this paper, we discuss the different views of mental lexicon structure and content. We try to proceed on the discussion of Elman's new proposal and confront it to data obtained by behavioral, neuroimaging and computational studies.

November 30 – Friday
Paper presentations – 10:30 - 12:00 – Hassis Room

10:30 – Text processing in Alzheimer’s disease and its relation with memory: a systematic review

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The study of cognitive characteristics in healthy aging and in dementia as in Alzheimer’s Disease (AD) is relevant in the current Brazilian scenario, where an increasing rate of life expectancy and the search for a higher life quality are observed. Research investigating normal aging demonstrates that the elderly present a lower performance as compared to young adults in tasks which measure attention, visuo-spatial capacities,
working memory and language aspects, such as inference selection in text comprehension, the computation of complex syntactic structures. Moreover, it has been observed that the phonological system is affected by AD before the lexical system (Ska et al., 2009). These modifications in cognitive processing bring consequences to the elderly adults’ life quality and to those who live with them. AD represents a public health problem all over the world, since it leads to a progressive functional decline and to gradual loss of autonomy. The AD framework is mainly characterized as a memory impairment associated to other cognitive disorders, such as language. Among the most affected memory systems is episodic memory, responsible for the recovery of past personal experiences. Besides episodic memory, semantic memory - which involves naming ability - is also harmed. This disruption in memory systems and the consequent low activation and retrieval of semantic information are attributed, according to Budson and Price (2005), to changes in inferior lateral temporal lobes or in frontal lobes. Thus, deterioration in language processing is an expressive symptom of AD progression (Rodrigues, 2004; Dell, 1986; Taussik et al., 2006). Changes noticed in this disease involve difficulty in production and comprehension at the phonological, lexical, sentence and text levels. Considering the aspects approached above, this talk intends to present data from a systematic review of studies on text processing in AD, at both the comprehension and production levels, by characterizing this processing and discussing issues on the relation between memory and text processing. A systematic search of articles published in the past 20 years (1992-2012) has been done in Pubmed, Scielo and Bireme databases, with the combination of these keywords: “Alzheimer Disease”, “text production”, “text reading”, “discourse production”, “discourse reading” and “memory”. Fifty-one (51) articles were found in the first database, only three articles in the second, while 48 articles were found in the third database.
11:00 – Talking about concepts of emotion in natural language: preparation for interface research

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People spend hours of their lives talking about what they feel, describing in detail their daily feelings and emotions. At the same time, the scientific community has been carrying out many studies involving emotions and their relation to several aspects – with reality, consciousness, rationality. However, when research involving the language of emotions is carried out, concepts seem to get fuzzy. Generally speaking, neuroscientific research treats language trivially, making considerations from conceptualizations based on common knowledge. What can be observed in the experiments is the lack of a greater linguistic-theoretical ground, so that relevant questions can be raised about the object of investigation. Even though neuroscientific research can be seen as empirical, a theoretical framework is necessary. It is important to make a difference between feelings and words, as well as a difference between corporal experience and the concepts of a given lexicon. Thus, I intend to show the possibility of a construction of an interdisciplinary research by means of the Metatheory of Interface (Costa, 2007). I aim to build a theoretical framework to the problem of approaching concepts and words of emotion in natural language – from a semantic-pragmatic perspective (Grice, 1975; SW, 1995; Levinson, 2000; Costa, in press) – so that it is possible to demonstrate that empirical research must be grounded on a careful theoretical work.
The objective of this research is to discuss the organization of the phonological knowledge of Brazilian Portuguese (BP) subjects, learners of English as a Foreign Language (EFL). We analyzed data from two cities: Fortaleza-Ceará (CE) and Mossoró-Rio Grande do Norte (RN). These communities were selected for CE BP speakers palatalize alveolar stops, e.g. [tʃ]ia e [dʒ]ia, whereas RN speakers do not, e.g. [t]ia e [d]ia. The vowel [i] is recognized as the trigger of the mechanism (Cristófaro Silva, 1999). BP palatalization of alveolar stops affects the production of EFL, once CE BP speakers also tend to palatalize EFL in similar contexts. Therefore, we expected the words fifteen and tea to be realized as fi[tʃ]een and [tʃ]ea by CE speakers and fi[t]een and [t]ea by RN speakers. Such categorical results were not found. There is, however, a tendency by CE EFL speakers to palatalize and RN EFL speakers not to palatalize. Variability is linked to specific phonological contexts and frequency effects of the analyzed words. Our hypothesis states different BP mental representations should produce different routes of EFL phonological acquisition. In order to test this idea we analyzed BP and EFL productions of CE and RN informants in a phonological network model (Bybee, 2001). As regards phonological contexts, we suggest a network model of specific BP contexts in CE and RN. E.g. in CE there are cases in which palatalization does not occur in forms ended by stico – determinístico, místico, etc – being realized [ʃʃikku] ou [ʃikku]. Such a reduction has an impact on EFL in forms such as student - [ʃ]udent or [ʃ]udent. On the other hand, RN BP speakers do have the forms rá[dʒ]io or pá[tʃ]io. That is, RN speakers also have similar palatalized forms as CE speakers do. Data is similar in both cases because they have phonetic details which are crucial in both L1 and L2 construction. Owing to redundant
information, different BP varieties will have different EFL acquisition characteristics. Synchronic variation in BP is found in EFL acquisition. This result debates the proposal of a unique mental representation for a given language. Additionally, we observed lexical frequency effects, once very frequent words for EFL students are more accurately produced by CE speakers, e.g. teacher, dictionary, produced without palatalization. Probabilistic effects question the homogeneous character of the mental representation. Our results indicate EFL construction by BP speakers operates through lexical connections subject to probabilistic effects. We argue that such a model allows us to treat L1 and L2 knowledge as interlaced cognitive mechanisms which safeguard particularities of both languages involved. This suggests language use is crucial to knowledge organization.

November 30 – Friday
Paper presentations – 14:00 - 15:30 – Auditorium

14:00 – The interplay of phonology and orthography in visual cognate word recognition: An ERP study

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Two major positions have been proposed in order to explain the differential processing of cognate vs. noncognate words: a lexical-morphological hypothesis (Davis et al., 2010), according to which the differential
processing observed in cognate words is due to their special morphological representation in bilingual memory; and a symbolic, localist connectionist framework (Dijkstra et al., 2010) that emphasizes the cross-linguistic similarity of cognate words. In order to contrast these hypotheses, we examined the role of phonological and orthographic similarity in the processing of cognate words by recording electrophysiological (event-related potentials –ERP) and behavioral data. One hundred and ninety-two words were selected: 96 cognate words based on their phonological and orthographic overlap vs. 96 noncognate words. Cognate and noncognate words were matched on frequency, bigram frequency, and length. Twenty-four proficient European Portuguese-English bilinguals performed a silent reading task combined with a masked priming paradigm. The results showed that phonology interacts with orthography during the first stages of visual cognate word recognition, supporting strong phonological proposals. Thus, the distinctive processing of cognate words seems to be due to their cross-linguistic similarity, which is consistent with a localist connectionist account on cognate representation and processing.

14:30 – Neuroanatomical representation of grammatical processing: Specifying Broca’s Area with a fMRI-study

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Here we present a functional magnetic resonance imaging (fMRI) study that focuses on a brain area which is involved in grammatical processing. We anticipate an ascertainment of known facts about cerebral speech centers and a novel detailed description of the grammatical district. So far, studies in German language have used primarily the confrontation
of study subjects with some inaccurate German tasks – and considered their cerebral activity with the interest in error signals. In this study we used a modified approach: We designed specific grammatical tasks relating to different grammatical sub-areas (building relative clauses, composing compound nouns, conjugate verbs and finding the acting subject in a complicated grammatical sentence and in a semantically free sentence). Additionally, we performed one task which was free from grammatical elements (reading monadic numbers) and showed a contrast relating to the localization of brain activity. The main different course concerning former studies is the strategy to bring the tested person into action and gain hereby an insight in the activated brain area. Therefore, we measured the natural change in blood flow, while our study subjects handled the grammatical tasks, by fMRI. For performing fMRI, we used a 1.5 T MR scanner with echo planar imaging (Sonata, Siemens Medical Solutions) and a block paradigm with 180 measurements in 6 blocks (rest alternating with activation, 25 slices, 3 mm thickness & resolution TR=2470, TE=60). The study design permitted to gain an insight into the functional organization of grammatical areas in human brain. They show how the component parts of syntax are housed in several distinct cerebral loci. Thus our present results imply the possibility of mapping the syntactical sections and associate each component part with a special area of grammatical responsibility. These areas can be localized as expected in the so-called Broca-area, which is accountable for the production of speech. Hence, a segmentation of this region seems to be essential for syntactical different speech production. The present data confirm the existence and segmentation of this specific brain area, which is responsible for grammatical processing. However, further studies are necessary, i.e. with patients with agrammatic aphasia.
15:00 – Allocation of cognitive effort in metaphor translation and post-editing: an eye-tracking study

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Building on the experimental paradigm of data triangulation in translation process research, this study aims at comparing cognitive effort allocated to two tasks of metaphor post-editing and one task of metaphor translation. Specifically, we aim at investigating the impact of raw machine translation output on post-editing effort in two tasks of metaphor post-editing by analyzing differences between fixation count and total fixation duration in areas of interest (AOIs) in source and target texts. We hypothesize that a) the raw machine translation output will have a positive effect on cognitive effort and b) manual translation will require more cognitive effort than post-editing. In order to test these hypotheses, an experiment was carried out at the Laboratory for Experimentation in Translation (LETRA) using eye-tracking and key-logged data and retrospective think-aloud protocols. This study analyses process-driven data collected from 4 subjects while post-editing and from 2 subjects while translating. Both tasks were performed using the same source text, i.e., a short extract of a newspaper text about the Tea Party Movement. To analyze the impact of raw machine translation output, 4 subjects were asked to post-edit a Google machine translated output in Task 1 (T1) and to post-edit a Systran machine translated output in Task 2 (T2). To compare cognitive effort between post-editing and manual translation, a group of 2 different subjects was asked to translate the same source text. For the purposes of this study, eye-tracking data related to total fixation duration and fixation count on the metaphor “The Tea Party Pork Binge” were analyzed. Data analysis shows that the cognitive effort allocated to metaphor post-editing is lower in T2 than in T1. These results provide indications that cognitive environment (Sperber & Wilson, 1986/1995) may be shown to have a
positive effect on reducing cognitive effort when post-editing metaphors. However, contrary to what Krings (1994/2001), O’Brien (2006) and Carl et al (2011) have found, our results show that cognitive effort in post-editing is higher than in manual translation. These results suggest that the raw machine translation output may have stimulated new inferences which, consequently, increased the allocation of cognitive effort in metaphor post-editing. In subsequent analysis we believe it is necessary to investigate whether the results will be the same when analyzing a larger number of metaphors.

November 30 – Friday
Poster Session – 15:30-16:30 – Hall
Note: The abstracts are organized according to the first author’s last name.

Frequency effects and the processing of verbal morphology by L1 and L2 speakers of English

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The focus of this study is the processing of regular and irregular verbal morphology by L1 and L2 speakers of English. The theoretical and empirical literature on the processing of English verbal morphology presents different accounts for the processing and representation of regular and irregular English verbs. The dual-mechanism account argues that there are two distinct mental mechanisms for the representation and processing of verbal morphology. One is a rule-based computational system for the processing of regular verbs, and the other is a memory-based computational system for the storage of irregular verbs (Ullman, Corkin, Coppola, Hickok, Growdon, Koroshetz & Pinker, 1997; Pinker, 1999; Van der Lely & Ullman, 2001; Pinker & Ullman, 2002; Ullman, 2004; Ullman,
In contrast, the connectionist single-mechanism account proposes that both rules and words are represented in a single computational system, and all forms (regular and irregular) are represented in a distributed associative memory (Rumelhart & McClelland, 1986; Plunket & Marchman, 1993; Joanisse & Seidenberg, 1999; McCelland & Patterson, 2002; Joanisse & Seidenberg, 2005; Woollams, Joanisse & Patterson, 2009). A third account for the processing of English verbal morphology is proposed by the full decomposition model of morphological complexity (Stockall and Marantz, 2006), which suggests that both regular and irregular inflectional forms are decomposed. This model also relies in a single system to process verbal morphology. However, the prediction that all verbal forms (regular and irregular) are decomposed by morphological rules challenges both the dual-mechanism and the connectionist single-mechanism views. In the context of verbal morphology processing, the objectives of the present study are: (a) to investigate the influence of frequency effects and proficiency on the processing of regular and irregular verbal morphology in English as L1 and L2, and (b) to investigate the role of inhibitory control and working memory capacity on the processing of English verbal morphology. In order to achieve these objectives, behavioral data were collected from a total of 72 participants, which were divided into three proficiency groups: (1) experimental group 1 consisted of 26 native speakers of Brazilian Portuguese with a high proficiency level in English as L2; (2) experimental group 2 consisted of 26 native speakers of Brazilian Portuguese with a low proficiency level in English as L2; (3) group 3 consisted of a control group of 20 native speakers of American English. The participants pre-selected for both experimental groups were required to take a proficiency test in English. All selected participants performed three tasks: (1) the Frequency Effects Task, which is a past tense production task designed to investigate English verbal morphology; (2) the Simon Arrow Task, which was used to assess participants’ inhibitory control function; and (3) the Letter-Number Ordering Task, which was used to assess participants’ working memory capacity. The results showed that participants’ inhibitory control function and working memory capacity did not affect the processing
of English verbal morphology. In addition, the results showed that the speakers of English as L1 and L2 behaved differently when processing regular verbs, most likely due to proficiency differences in the English language. However, all participants, regardless of their proficiency group, decomposed irregular verbs. Irregular forms decomposition is predicted only by the full decomposition model. Therefore, the full decomposition model of morphological complexity offers the strongest account for the results found in the present study.

Investigating the relationship between memory systems and distinct levels of L2 proficiency: a psycholinguistic study

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Memory is one of the mental processes of human cognition. It is one of the fundamental parts of cognitive processing, which also includes attention, perception, reasoning, and language. It is through these functions that humans are capable of interacting with other human beings and with the world. For bilinguals, this interaction takes place through the knowledge and use of at least two languages, which involves cognitive and linguistic processes that are systematically different from those engaged in monolingual language use (Bialystok, 2010). In this sense, bilingualism entails skills of mental management which should apply to aspects of cognition such as attention, conflict resolution, and executive control (Bialystok, Craig, Green & Gollan, 2009). Previous research has demonstrated that bilingualism seems to bring advantages to certain cognitive abilities, including executive functioning and working memory (Bialystok, Craik & Luk, 2008). Based on the assumptions presented above, the current study goes a step further to investigate whether bilingualism affects declarative and procedural memory systems positively. Forty
young adult participants were divided into 3 groups: two experimental and one control group. The first experimental group consisted of 16 high L2 proficiency Portuguese-English bilinguals. The second experimental group consisted of 16 low L2 proficiency Portuguese-English bilinguals. The third group was the control group and consisted of 8 Brazilian Portuguese monolinguals. All participants were tested in four psycholinguistic tasks, designed in Brazilian Portuguese (L1), which aimed at assessing declarative and procedural memory. Prior to testing sessions, all participants were submitted to one of three types of proficiency tests. Bilinguals at a low level of proficiency performed the Cambridge ESOL ‘Key English Test’, whereas those at a high proficiency performed the Cambridge ESOL ‘Preliminary English Test’ (PET). The control group of monolinguals performed the Mini Language English Test, designed for the purposes of the present study to control for their knowledge of English. In the psycholinguistic tasks, the dependent variables were reaction time (RT) and accuracy (ACC), and multiple comparisons were run for data from the three groups. Overall results showed that most of the comparisons between bilinguals and monolinguals favored bilinguals in the performance of memory tasks, especially those aimed at assessing declarative memory. For the comparisons between the high proficiency group, the low proficiency group, and monolinguals, in the linguistic tasks, there was a significant difference in performance favoring the high proficiency group in relation to their low proficiency and monolingual counterparts, suggesting a positive effect of L2 proficiency on these tasks. For the comparisons between the same groups in the nonlinguistic tasks, there were also statistically significant differences for the high proficiency group overall performance. Taken together, the results of the present study indicate that a higher level of proficiency in an L2 seems to contribute to more accurate performance on L1 declarative and procedural memory tasks. These results are discussed in light of the theoretical and empirical literature on human memory, bilingualism and language proficiency.
Correlating event noun priming and semantic space similarity in Spanish

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The relevance of the lexicon for present-day theories of language is sustained both on theoretical grounds and on psycholinguistic and neurobiological evidence. Several related experiments point to the representation of rich pragmatic information within the lexicon. We replicated some of the experiments performed by Hare and coworkers (2009), using nouns (in Spanish) that denote events as primes of nouns that denote participants of the events. The basic result is that across subjects, a subset of the nouns denoting events effectively prime the nouns of typical participants but there is another subset of event nouns where the reaction time is systematically shorter for unrelated nouns, a difference that persisted even when another set of subjects performed the experiment. Trying to understand this difference we created a semantic space using Latent Semantic Analysis based on the Spanish version of Wikipedia. We measured the cosine semantic similarity between prime and targets showing that in most cases where no priming was observed, semantic similarity between the prime target in the unrelated condition was higher than in the related condition. We analyze possible interpretations of these results.
Inclusion and integration in a coexistence environment therapy – aphasia’s reporting experiences

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Aphasia, a language disorder, generates debates among professionals who engage in rehabilitation of aphasic patients. The lesions affect language and its use. The aim of this poster is to present data about how to stimulate communication through interaction and the interrelation with the social environment. We will report the experiences of a supervised internship, whose proposal was the organization of a language group, composed of aphasic patients who were having individual speech therapy at an Integrated Clinic Center. The individuals were invited to participate in this project, which consisted of twenty-four weekly meetings, which lasted around thirty minutes each. This project was approved by the Ethics and Research Committee under the Protocol 245/2010. Three female individuals participated in the group, all affected by stroke and diagnosed with aphasia: GSL, 47 years old, Anomic Aphasia, with greater limitations at the syntactic language level; MLP, 65 years old, Sensorial Trans cortical Aphasia and greater difficulty to produce words; and MNR, 60 years old, Motor Trans cortical Aphasia, with greater difficulty in oral expression. The objective was to encourage social inclusion from themes that would promote communication and we hypothesize the possibility of the participants to accept their own language limits, the perception and recognition of language limitations of the others, as well as the difficulty in being understood. Actions of social harmony through activities that require interaction and discussion of tasks were proposed to the Group. In the meetings, participants worked with the theme: “Rio Grande do Sul State”, bringing opportunities for exhibition activities from discussions about the city of Porto Alegre, points of interest and their specificities. Moreover, the creation of a journal was
suggested to register the activities carried out during the week, reported to the group, in each meeting. Language enables communication and interaction in unlimited ways between individuals, allowing actions in the environment (cognitive activity) and with others (communicative activity). Only from these actions can individuals actively exercise their role in society. Aphasia interferes in this social role, because it is characterized by changes of linguistic processes of meaning and discourse, irrespective of whether they can join the changes of other cognitive processes. The Language Group brought social and cognitive gains to the participants, observed by means of language access strategies that they gave each other, by the numerous attempts to create dialogues and/or by providing lexical access tracks. The participants integrated easily, respected individual difficulties and language impairment. Thus, the created environment promoted a space to aphasic therapy to deal with individuals’ difficulties and portray their everyday social experiences. This interaction experience enabled us to understand the benefit that group work can provide, encouraging the internship activity to continue. The experience allows us to conclude that through discursive practice, individuals attempt to establish their language.

**Testing effect on the recall of verbal information and learning**

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Retrieving information from memory increases the posterior retention of this information, a phenomenon named “testing effect”. In the current study, the experimental parameters required to elicit this effect were examined in a systematic review of articles which investigated this phenomenon utilizing verbal stimuli and various experimental manipulations. The articles were organized in the test format: recall tests (free recall or cued recall) and recognition tests. The current review included articles published between
the years of 2006 and 2012, a period in which there was an acute increase in the amount of publications on this subject. The articles were searched in the databases Web of Science, PubMed, and PsychINFO. The results demonstrated that tests can produce effects that are remarkably benefic to long term memory retention. Further research is needed to shed light on the potential cognitive processes underlying this phenomenon, as well as to elucidate the implications of this phenomenon for the development of efficient educational practices.

Spanish Psych-verbs: Do Case constraints influence incremental parsing?

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Previous results from a self-paced reading study using Spanish Object Experiencer Psych verbs (e.g. ‘gustarle’) and Dative verbs (e.g. ‘gritarle’) showed that readers took longer to process the second argument of the sentences when the verb belonged to the first group. This could mean that differences in the way the semantic arguments are mapped onto the syntactic structure could have an impact on on-going comprehension. Apart from this, the mentioned study shows that comprehension is enhanced when the arguments follow the canonical semantic order (i.e. ‘Experiencer’/’Actor’ – ‘Undergoer’). However, it might be the case that these differences in both the on-line and the off-line tasks are the result of using verbs from two different semantic categories, mainly Psych-verbs and Action verbs. To account for this possibility, a second study using two types of Psych-verbs in Spanish was performed. These groups of verbs map their semantic arguments into the syntax in different ways as well,
and are therefore known as Subject Experiencer vs. Object Experiencer Psych-verbs (Belletti & Rizzi, 1988). They also show differences in the word order needed to respect the semantic hierarchy (i.e. SVO for the first group and OVS for the second group). Thus, they can provide further evidence about how information proceeding from the syntax-semantics interface influences sentence comprehension. In the off-line task, the study replicated the results from the first experiment. Participants responded questions significantly faster and more accurately when the order of the sentence previously presented respected the semantic hierarchy. Nevertheless, the pattern of results found on the on-line task showed that participants took longer to process the second argument of sentences when the verb belonged to the group of verbs with direct mapping (SubjExp Psych verbs). They also showed larger latencies when the sentence was presented in the canonical syntactic order of Spanish. In the present study we aim to disentangle the results obtained in the two previous experiments. We believe that the results from the on-line task of the second experiment are a consequence of the trade-off between studying verbs from the same category and differences in case assignment of the Theme argument of these verbs. In Spanish, SubjExp Psych-verbs assign accusative case while ObjExp Psych-verbs assign dative case. This characteristic becomes relevant since Spanish accusative pre-verbal clitic is only mandatory when the reference has been named before (as in ‘[La maestraNOM] laACC quiere.’ - ‘The teacher loves her.’) but it is not obligatory when it precedes the object (as in ‘[La maestraNOM] (laACC) ama [a la cocineraACC].’ – ‘The teacher loves the cook’). On the contrary, dative pre-verbal clitic is obligatory in both situations (as in ‘[La maestraNOM] leDAT gusta.’ - ‘She/he likes the teacher’ and ‘[La maestraNOM] leDAT gusta[a la cocineraDAT].’ - ‘The cook likes the teacher’). In this study, we examine the consequences of adding non-obligatory clitics for sentence incremental parsing, and we discuss the importance of these results for expectation-based parsing models.
The relationship between working memory capacity and speech perception: testing the validity of a categorical discrimination test

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The present study aims at investigating the validity of an adaptation of the Categorial Discrimination Test (CDT) (Flege, Munro, & Fox, 1994) for assessing perception of non-native contrasts for which the CDT was not primarily designed. The CDT was developed to test perception of vowels and in the present study it was adapted to investigate a segment within a word which resulted in longer trials; therefore, the effect of the variable “working memory demand” had to be tested. The relationship between working memory capacity (WMC) and speech perception in a foreign language was assessed through two perception tests: an adaptation of the CDT and an identification task. Both perception tests deal with either discrimination or identification of English word-final nasals. WMC was assessed by means of a listening span task in English and a listening span task in Brazilian Portuguese. The identification test was included because if a significant correlation between WMC and the scores from the identification test were found, it could be reasoned that WMC would be an important predictor of accurate perception. On the other hand, if the CDT results correlated only with WMC, there would be a possibility that the adaptation of the CDT was too demanding and was not actually testing perception. The data were collected from sixteen Brazilians who were advanced students of English. The results show that perception tests of non-native phonetic categories do not seem to be affected by WMC.
Abstracts

Conceptual integration of emotions domains in narratives of traumatic events

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This paper aims at discussing the role of conceptual integration networks – characterized by Fauconnier and Turner (2002) and largely applied in cognitive semantics as an asset to structured cognitive domains such as mental spaces (Fauconnier, 1994) and conceptual metaphor (Lakoff & Johnson, 1980, 1999) – in complex metaphorical human thinking as an important aspect of our conceptual system. We derive from the exhaustively explored (albeit subject to more robust experimentation) assumption that our conceptualization activities are embodied by means of both our sensory-motor systems and socially available cultural models. Moreover, metaphorical thinking as suggested by Grady (1997) is grounded on sensory-perceptual bases of our early experiences which form metaphor ‘primitives’ responsible for complex thinking in later cognitive development. This structuring process points out to two levels of cognitive analysis of metaphorical thinking: a neurocognitive explanation of the ways sensory-motor experiences turn into metaphorical primitives by means of neural connections simultaneously activated in different cortical areas when individuals are subjected to those experiences, including emotions; and a cognitive-linguistic explanation of the ways metaphorical primitives turn into complex metaphorical thinking and its counterparts in language (metaphorical linguistic expressions of emotion) by means of conceptual innovation of integrated/blended cognitive domains. Our own analytical approach to this process considers both levels and focuses on metaphorical thinking of emotions such as hatred, anger, fear, shame, blame, resentment, repugnance, and the like linguistically portrayed in narratives of traumatic events. Data gathering was done twofold: subjects were selected among those who had previously suffered from traumatic
experiences (urban violence such as armed-robbery, car accidents, murder of a friend/relative, and the like; serious diseases; suicide of a friend/relative; police violence, etc.) and were asked to join one of the two experimental research groups. In group one, subjects were presented with visual stimuli of traumatic experiences and asked to talk exclusively about the event displayed on the screen. In group two, subjects were asked to read a piece of news regarding a traumatic event and then to describe their own experience of a similar event. In both groups narratives were video recorded. Correlations between language of emotions, metaphorical thinking, and sensory-motor experiences were then made considering: the processes of conflation of experiences into metaphors; deconflation of metaphorical primitives; conceptual integration of sensory and emotional inputs; the role of complex metaphors in structuring our conceptual system. As for the neurocognitive level of analysis we outlined some features of neural connections created to correlate experiences to emotions and these two to metaphors. As tentative results we can so far demonstrate the content unpredictability of blend’s emergent structures as contrasted with primitive metaphor mappings, as well as the role of these cognitive domains in our conceptualization system.

Understanding of grammatical sentences by individuals with Alzheimer’s disease: some applications of conceptual imagery theory to language comprehension

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This paper aims at identifying the influences of visual/auditory inputs in the online understanding of grammatical sentences by individuals who were diagnosed with Alzheimer’s disease. This understanding involves conceptual imagery, as posited by Cognitive Grammar theory (Langacker,
Abstracts

2000, 2009), and considers conventional dimensions of conceptualization such as level of specification, prominence and perspective. Cognitive Grammar is based on the idea that meaning is constructed cognitively, and grammatical structures are conceived as inherently symbolic, providing structuring and conventional symbolization for conceptual content. Based on this premise, this work is based on research of cognitive grammar aspects proposed by Langacker (2000). Studies of language and sentence comprehension by individuals with Alzheimer’s have been the subject of various linguistics and neuroscience laboratories whose researches show stages of deterioration of language, from the difficulty to understand simple sentences in the initial stage, the difficulties in understanding complex sentences with passive voice, at an intermediate stage, to the almost complete dissolution of language skills in the terminal stage. Methodologically, this research focuses on a subject population constituted of five elderly Alzheimer’s individuals, who participate in an institutional group of cognitive stimulation, and five other elderly people who show no evidence of cognitive impairment and constituted the control group. Data collection was carried out among these subjects and consisted of the results of four online experiments such as self-monitored reading and listening, combined with instruments of eye-tracking monitoring and video recording. We prepared a list of 15 short sentences with follow-up reading comprehension questions of three types: level of specificity, prominence and perspective in conceptualization processing, according to experimental tasks carried out. The first experimental task was designed to verify visual input influence (written text) in the comprehension of grammatical sentences. The second task looks into visual input (written text + image) as influential in sentence comprehension. The third experiment aimed at determining the influence of auditory input in the understanding of grammatical sentences and the fourth experiment investigates whether the combination of visual and auditory input facilitates or hinders the understanding of grammatical sentences. This is an ongoing study, whose data were collected and are still being analyzed according to a statistical package. Our results aim at identifying
the differences in the understanding of grammatical sentences based on the influence of visual input (text), visual (text and image), a combination of auditory and visual (text and image) and audio, the reaction time in milliseconds between the end of the reading/listening to the sentence and the beginning of the responses, the correct hitting rate of interpretive questions. As part of the initial results, we identified increased speed of sentence comprehension by the control group and greater preference for grammatical sentences with visual input (text and image). It has been found that reading comprehension is affected earlier and more seriously than listening skills. Problems in working memory, visual deficits such as attentional, lexical access and deterioration of semantic representations may account for those difficulties. The study on the understanding of grammatical sentences by people with Alzheimer’s with online techniques is considered to be relevant as it may help diagnose cognitive and linguistic impairment at an early stage.

Presenting a methodological approach to study the neurocognition of gender morphology in Brazilian Portuguese

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Within the language acquisition and processing literature, there are two main different views concerning the neural representations of inflectional morphology: The dual mechanism models and the single mechanism models. Dual-mechanism models posit a neurodissociation of language processing: a mental lexicon and a mental grammar (Chomsky, 1995; Pinker, 1999, Ullman, 1997; Ullman, 2001, Ullman, 2007). The mental lexicon is assumed to store irregular/idiosyncratic items of language and the mental grammar is assumed to process rule-governed items. On the other hand, single-mechanism models reject
the idea of a neurodissociation of language processing and posit that language is processed by a single associative network (Bates & Wulfeck, 1989; Bates & Wulfeck, 1991; Bates & Macwhinney, 1989; Macwhinney, 1997; Macwhinney, 2002, 2001, 2005; Chater & Manning, 2006). These predictions can be tested through the frequency effects task and the sentence-violation task adopted in event-related potentials recording. Differently from most studies in the field that have analysed the morphology of past tense, in this paper we report the challenges and lessons learned in the construction of a frequency effect task and a sentence violation task to study the processing of gender agreement in Brazilian Portuguese as L1 and L2. The methodological approach employed semantic (male/female nouns), (morpho)syntactic (nouns with or without gender endings) and phonological criteria (number of phonemes and syllable stress) to select high frequency and low frequency regular and irregular nouns. The frequency of the nouns was based on their number of occurrence in two corpora: the CETEMFOLHA corpus (Corpus de Extractos de Textos Electrónicos NILC/Folha de S. Paulo) and the Brazilian WebPages indexed by the GOOGLE search tool. The selection of the nouns was also based on an evaluation performed by 10 Brazilian native speakers (from different regions of Brazil) that judged the nouns as high or low frequency items. Similar structured sentences containing the 64 selected nouns were created to be used as stimuli for the two tasks.
Procura-PALavras (P-PAL): A Web application for a new European Portuguese lexical database

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Electronic lexical databases are key elements for research development in areas such as Psycholinguistics, Neuroscience, Cognitive Psychology, and Linguistics. Words are the raw material used in most of these studies and appropriate control of the stimuli is critical for well-controlled research in a given language. Lexical databases are currently available in different languages, such as English (e.g., MRC - Coltheart, 1981; N-Watch – Davis, 2005), French (e.g., BRULEX - Content, Mousty, & Radeau, 1990; LEXIQUE - New, Pallier, Ferrand, & Matos, 2001; New, Pallier, Brysbaert, & Ferrand, 2004), Dutch and German (e.g., CELEX - Baayen, Piepenbrock, & Gulikers, 1995; Baayen, Piepenbrock, & van Rijn, 1993), Spanish (LEXESP – Sebastián-Gallés, Martí, Cuetos, & Carreiras, 2000; BuscaPalabras – Davis & Perea, 2005), Basque (E-Hitz – Perea, Urkia, Agirre, Laseka & Carreiras, 2006), Greek (GreekLex - Ktori, van Heuven, & Pitchford, 2008) or Arabic (ARALEX - Boudelaa & Marslen-Wilson, 2010), although they are very limited in European Portuguese (EP). Procura-PALavras (P-PAL) aims to overcome that limitation by offering a cross-platform web application that enables the computation of a great number of objective (lexical and sublexical) and subjective EP word statistics. Apart from the computation of the default word frequency per million words (for ≈210.000 non-
lemmatized and ≈54,000 lemmatized words extracted from a corpus of over 230 million tokens – see Soares et al., 2011), P-PAL provides several EP word measures, namely grammatical (e.g., POS), orthographic (e.g., number of letters, CV structure, orthographic uniqueness point and bigram frequency measures), phonological (e.g., spelling, number of phones and biphone frequency measures), syllable (e.g., orthographic and phonological syllabification and type and token syllable frequencies), and neighborhood statistics (e.g., substitution, addition, deletion and transposition neighbors, neighbor distribution according to letter position and frequency). P-PAL also offers norms for subjective indices, such as imageability, concreteness, subjective frequency, valence, arousal and dominance for 3,800 EP words. The user can customize the information provided by performing queries that meet specific research requirements. In order to obtain these statistics the user can choose between a lemma or wordform analysis in the application and perform one of two word-based queries available: (i) generate lists of words with specific objective and/or subjective properties or (ii) analyze word lists according to specific objective and/or subjective properties. We believe P-PAL is a fundamental resource for the promotion and internationalization of psycholinguistic research in Portuguese. In this paper we present the web application, available at http://p-pal.di.uminho.pt/tools.

Pragmatic priming in Spanish

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The notion of a static and passive lexicon has been questioned based on several converging approaches. Recently, some reports have pointed out that the amount of information stored in the lexicon can be huge and diverse, casting doubts on the idea of the lexical store being a relevant
entity. In particular it has been shown that nouns that denote events are
effective primes for the nouns that denote the typical participants of the
corresponding events and nouns that denote objects (Cognition, 2009, p.
151.). We replicated the experiments of Hare and coworkers using nouns
in Spanish. A set of the nouns denoting events shows a clear effect of
priming over participants, but there is another set that shows the reverse
pattern. This difference resisted changes in the protocol aimed at reducing
variance or by better training the participants. In order to analyze the
neurobiological basis of such robust difference, we started analyzing
brain electric activity through Electroenfephalography (EEG) using an
evoked potential and a wavelet approach. A set of hypothesis about the
organization of the lexicon is presented based on the relationship between
behavioral and EEG data.

December 1 – Saturday
Paper presentations – 9:30 – 11:00 – Auditorium

9:30 – Childhood bilingualism: An investigation about inhibitory
control

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Recent research on childhood bilingualism has indicated that the daily
use of two or more languages sharpens the development of certain
cognitive processes, such as selective attention and inhibitory control, as
well as linguistic and metalinguistic processes, in bilingual children when
compared to monolingual children of the same age (Bialystok, 2001, 2005,
2006, amongst others). However, this advantage has only been observed
with native bilingual children, or children with very high proficiency levels
in both languages. To fill this gap, the present study aimed to investigate the effect of bilingualism on inhibitory control in bilingual children who experience bilingualism (or second language learning) exclusively in a school context, compared to the usual sample of bilingual children who experience bilingualism at home or in the community. Thus, 174 children of ages 9 to 12 from three different linguistic groups (75 school bilinguals; 57 home bilinguals and 42 monolinguals) participated in the study. Children completed both the Simon Arrows and the Stroop Tasks to assess their inhibitory control with both non-linguistic and linguistic stimuli. Results suggest that bilingual children from a school context, who deal with both languages on a daily basis, although only at school, also show cognitive advantages due to a bilingual experience.

10:00 – Inhibitory control in multilinguals: a longitudinal study

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This study examines multilingualism and executive functions from the perspective of dynamical systems, and aims to compare the performance of monolingual and multilingual children evaluated in 2008 and the same participants four years later, on tasks involving executive function - inhibitory control and attention. When bilinguals change the language in use by another - code-switching -, the control required to inhibit the language that is not being used during a specific part of the linguistic interaction can improve their performance in various tasks requiring executive inhibitory control. Therefore, the increase in the inhibitory enhanced by code-switching can also help stimuli control inhibition in nonverbal tasks. The participants were 20 monolingual and 20 multilingual individuals, first tested when they were about 8-10 years old, and then retested four years after. The language spoken by the monolingual
participants is Brazilian Portuguese (BP), and the multilingual participants speak Pomeranian (L1), German (L1), and BP (L2). To test the executive function, Simon task was used as a replication of Bialystok (2003) study. In the task used, stimuli are presented with different target features and in different positions. Participants are instructed to respond only to target features (for example, by pressing the right or the left key of a computer or serial box according to whether the stimulus is a red or a blue square) but to ignore the position of the stimulus on the screen. Accuracy and reaction times were measured, as well as the Simon Effect. Statistical tests are being run, so that differences between mono and bilingual (between group analysis) as well as differences between the bilinguals’ performance in the two moments in time (within group analysis) can be assessed.

10:30 – Is sameness a primitive function in language processing?

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Several years ago, G. Marcus showed that infants habituated to a sequence of phonemes attend less to a new sequence if it follows the abstract pattern on which the habituation sequence was based, than to a new sequence that does not follow the pattern. Many connectionist models were proposed to explain these experiments but Marcus argued that those that worked did so because they incorporated some rule based device. Several authors pointed out that if previous training allowed the system to learn at least a function capable of telling whether two successive vector inputs are the same (hereafter sameness) then the habituation experiments could be modeled. In this work we analyze what is required in order to learn sameness. I train several simple recurrent networks of different numbers of hidden and input units. The main results are that training is slow and more importantly, that in all our simulations all input combinations are
needed in the training set, something that makes it unfeasible for the function to be learned without at least some bias to the initial learning architecture. I present several alternative architectures that can be used to learn sameness. I also show that the functioning of the network requires a one-to-one mapping between inputs and part of the hidden states and an equivalence function that maps from hidden states to the output. I also show that in line with previous work, the equivalence part is the hardest to be learned. Given the initial complexity of these networks and the specialization they impose in other networks, I propose that sameness is a fundamental dedicated property of neural cognitive system, in particular of those dedicated to language processing.