Workshop on Bilingualism

Neurolinguistic and Psycholinguistic Perspectives

12 – 14 September, 2011

Aix-en-Provence, France

Tuesday, September 13th

8:00-8:45 Registration

8:45-9:00 Welcome

9:00-10:00 Keynote 1
Holger Hopp

10:00-11:00 Oral Session 1
Syntactic processing

10:00-10:20 [OS-1.1]
10:20-10:40 [OS-1.2]
10:40-11:00 [OS-1.3]

11:00-11:30 Coffee break

11:30-12:30 Oral Session 2
Lexicon / Semantics

11:30-11:50 [OS-2.1]
11:50-12:10 [OS-2.2]
12:10-12:30 [OS-2.3]

12:30-14:30 Lunch & Poster Session 1

14:30-15:30 Keynote 2
Andrea Weber

15:30-16:10 Oral Session 3
Phonetics / Phonology, Speech production

15:30-15:50 [OS-3.1]
15:50-16h10 [OS-3.2]
16:10-16:30 [OS-3.3]

16:30-17:00 Coffee break

17:00-18:00 Keynote 3
David Corina

Conference dinner at Aquabella Spa and Hotel (registration required)

Wednesday, September 14th

8:30-9:00 Registration

9:00-10:00 Keynote 4
David Green

10:00-11:20 Oral Session 4
Lexicon / Semantics

10:00-10:20 [OS-4.1]
10:20-10:40 [OS-4.2]
10:40-11:00 [OS-4.3]
11:00-11:20 [OS-4.4]

11:20-11:50 Coffee break

11:50-12:50 Oral Session 5
Early acquisition, Phonetics / Phonology, Speech perception

11:50-12:10 [OS-5.1]
12:10-12:30 [OS-5.2]
12:30-12:50 [OS-5.3]

13:00-15:00 Lunch & Poster Session 2

15:00-16:00 Keynote 5
Vincent Lubrano

16:00-16:30 Coffee break

16:30-17:30 Oral Session 6
Syntactic processing

16:30-16:50 [OS-6.1]
16:50-17:10 [OS-6.2]
17:10-17:30 [OS-6.3]

17:30-18:00 Close of Conference:
Closing remarks

Welcome to the Aix-en-Provence Workshop on Bilingualism

The Aix-en-Provence Bilingual Workshop is the 7th annual meeting of research scientists interested in the workings of the bilingual brain. First held at the University of Trento in Rovereto, Italy, for three consecutive years from 2005 to 2007, the workshop now travels yearly across Europe. It has been held at the University of Ghent (Belgium, 2008), then at the ESRC Centre for Research on Bilingualism in Bangor (United-Kingdom, 2009), the Basque Center on Cognition, Brain and Language (Spain, 2010) and now, it is hosted by the Laboratoire Parole et Langage (Aix-Marseille Université & CNRS) in 2011.

The workshop, which has grown from a small yet international gathering to an established annual meeting, attracts researchers from all over Europe and North America, as well as a handful from Asia. We are delighted to have colleagues from Australia this year!

The aim of the workshop is to provide an interdisciplinary forum for the study of bilingualism. This year's scientific program, consisting of experimental studies from the fields of psycholinguistics, linguistics and neuroscience will indeed be the source for rich and varied discussion.

We welcome you to Aix-en-Provence, a city steeped in both culture and academia (2009 marked the 600th year of the University of Aix). We hope you will enjoy your stay and the conference.

Local organizing committee

F.-Xavier Alario, Carine André, Armelle Bonpain, Sébastien Bermond, Haydee Carrasco, Cyril Deniaud, Martine Faraco, Cheryl Frenck-Mestre, Joëlle Lavaud, Nadia Monsegu, Pauline Peri, Claudia Pichon-Starke, Peter Prince, Jasmin Sadat

Scientific committee

F.-Xavier Alario, Martine Faraco, Alice Foucart, Cheryl Frenck-Mestre and Peter Prince

Acknowledgements

We wish to thank all of our sponsors for their generous support:

- Laboratoire Parole et Langage (CNRS & Aix-Marseille Université)
- Laboratoire de Psychologie Cognitive (CNRS & Aix-Marseille Université)
- Centre National de Recherche Scientifique (CNRS)
- Aix-Marseille Université

Our special thanks to the Institut Universitaire de Formation de Maîtres, Aix-en-Provence, for having generously opened their doors to the conference.

We express our gratitude to all the external reviewers for having helped us put together a wonderful program.

Last, but certainly not least, we thank all of the conference members for their participation.

Bienvenue au Colloque sur le Bilinguisme à Aix-en-Provence

Le colloque de Bilinguisme d'Aix-en-Provence est la 7ème rencontre de chercheurs intéressés par le fonctionnement du cerveau bilingue. Ce colloque eu lieu pour la première fois à l'Université de Trento, Italie, pendant 3 années consécutives (2005-2007). Depuis, le colloque voyage à travers l'Europe puisqu'il s'est tenu à l'Université de Ghent (Belgique) en 2008, au Centre for Research on Bilingualism in Bangor (Royaume-Uni) en 2009 et au Basque Center on Cognition, Brain and Language (Espagne) en 2010. Cette année, en 2011, il a été organisé par le Laboratoire Parole et Langage (Aix-Marseille Université & CNRS).

A ses origines, le colloque a réuni un petit groupe de chercheurs venus de quelques pays. C'est maintenant un événement annuel bien établi qui attire des chercheurs de toute l'Europe, d'Amérique du Nord, ainsi que, dans une moindre mesure, d'Asie et d'Océanie.

L'objectif du colloque est de fournir un lieu d'échanges interdisciplinaires autour de l'étude du bilinguisme. Dans le programme scientifique de cette année convergent la psychologie expérimentale, la linguistique et les neurosciences cognitives. Ce programme devrait fournir de nombreuses opportunités d'avoir des échanges scientifiques riches et variés.

Nous vous accueillons à Aix-en-Provence, une ville ancrée dans la culture et la connaissance, dont l'université a célébré son 900^{e} anniversaire en 2009. Nous espérons que votre séjour vous apportera pleine satisfaction.

Comité local d'organisation

F.-Xavier Alario, Carine André, Armelle Bonpain, Sébastien Bermond, Haydee Carrasco, Cyril Deniaud, Martine Faraco, Cheryl Frenck-Mestre, Joëlle Lavaud, Nadia Monsegu, Pauline Peri, Claudia Pichon-Starke, Peter Prince, Jasmin Sadat

Comité scientifique

F.-Xavier Alario, Martine Faraco, Alice Foucart, Cheryl Frenck-Mestre et Peter Prince

Remerciements

Nous souhaitons remercier ici tous nos généreux sponsors pour leur soutien :

- Laboratoire Parole et Langage (CNRS & Aix-Marseille Université)
- Laboratoire de Psychologie Cognitive (CNRS & Aix-Marseille Université)
- Centre National de Recherche Scientifique (CNRS)
- Aix-Marseille Université

Nous remercions tout particulièrement l'Institut Universitaire de Formation de Maîtres (IUFM) d'Aix-en-Provence pour avoir généreusement ouvert ses portes au colloque.

Nous sommes reconnaissants aux experts et relecteurs externes pour l'aide qu'ils ont fourni lors de l'élaboration du programme scientifique

Pour finir, nous remercions tous les participants d'être venus et contribuer ainsi à la réussite du colloque.

Tuesday, September 13th

8:00-8:45 Registration

8:45-9:00 Opening: Welcome introduction. Peter Prince, Cheryl Frenck-Mestre

9:00-10:00 Keynote lecture 1 [KL-1]

Linguistic and computational contributions to non-convergence in late L2 acquisition
Holger Hopp, U. Mannheim

10:00-11:00 Oral Session 1 Syntactic processing

10:00-10:20 [OS-1.1] Case or postposition? The brain can tell the difference: an ERP study on morphological processing in natives and near-natives. *Adam Zawiszewski, Kepa Erdocia, Mikel Santesteban, Itziar Laka*

10:20-10:40 [OS-1.2] Proficiency and Working Memory Effects in the L2 Processing of Short and Long Subject-Verb Agreement Dependencies: Evidence from Event-Related Potentials. *Robert Reichle, Annie Tremblay, Caitlin Coughlin*

10:40-11:00 [OS-1.3] The temporal dynamics of second language acquisition: The role of age of acquisition, L2-proficiency, L1-transfer and training environment as reflected by ERPs. *Karsten Steinhauer*

11:00-11:30 Coffee break

11:30-12:30 Oral Session 2 Lexicon / Semantics

11:30-11:50 [OS-2.1] The balance in unbalanced bilingualism: Automatic co-activation of translations across different types of unbalanced bilinguals. *Maria Dimitropoulou, Jon Andoni Duñabeitia, Kevin Diependaele, Manuel Carreiras*

11:50-12:10 [OS-2.2] ВИНО (‘wine') is affected by ВЕРА (‘faith') but not by BOOT: An ERP investigation of L2 to L1 influence during reading aloud. *Kalinka Timmer, Yulia Mitlina, Lesya Y. Ganushchak, Niels O. Schiller*

12:10-12:30 [OS-2.3] Please, Catalan or Spanish, but not both! Are bilinguals fully in control of their language selection during word production? *Clara Martin, Charlotte VandenBulcke, Jordi Navarra, Sofie Schoonbaert, Robert Hartsuiker, Albert Costa*

12:30-14:30 Lunch & Poster Session 1

14:30-15:30 Keynote lecture 2 [KL-2]

Adaptive listening: the case of foreign accents. Andrea Weber, Max Planck Institue

15:30-16:10 Oral Session 3 Phonetics / Phonology, Speech production

15:30-15:50 [OS-3.1] Are L2 perception and production correlated? *Sharon Peperkamp, Camilla Bouchon*

15:50-16h10 [OS-3.2] An fMRI study of changes in sensorimotor control in response to learning to produce non-native speech sounds. *Anna J. Simmonds, Richard J. S.Wise, Paul Iverson, Robert Leech*

16:10-16:30 [OS-3.3] Phonological co-activation of both languages in bilingual speech production. *Katharina Spalek, Noriko Hoshino, Markus F. Damian, Guillaume Thierry*

16:30-17:00 Coffee break

17:00-18:00 Keynote lecture 3 [KL-3]

Sign Language and the Bilingual Mind. David Corina, UC DAVIS

Conference dinner at the Aquabella Spa and Hotel (registration required)

Wednesday, September 14th

8:30-9:00 Registration

9:00-10:00 Keynote lecture 4 [KL-4]

Normal and pathological language control in bilinguals. David Green, UCL

10:00-11:20 Oral Session 4 Lexicon / Semantics

10:00-10:20 [OS-4.1] Lexical processing is delayed by 100 ms in a second language. *Emily Coderre, Walter J.B. van Heuven, Kathy Conklin*

10:20-10:40 [OS-4.2] Semantic interference is cumulative across languages: implications for models of bilingual speech production. *Elin Runnqvist, F-Xavier Alario, Kristof Strijkers, Albert Costa*

10:40-11:00 [OS-4.3] Early orthographic effects in spoken word recognition with non-dominant bilinguals depend on proficiency level. *Ouit Veivo & Juhani Järvikivi*

11:00-11:20 [OS-4.4] Neighborhood densitiy and the developement of lexical entries in bilinguals. *Nathalie F. Wess, Bruce Stevenson and Inés Antón-Méndez*

11:20-11:50 Coffee break

11:50-12:50 Oral Session 5 Early acquisition, Phonetics / Phonology, Speech Perception

11:50-12:10 [OS-5.1] Effect of bilingualism on lexical stress pattern discrimination in French-learning infants. *Ranka Bijeljac-Babic, Josette Serres, Barbara Höhle, Thierry Nazzi*

12:10-12:30 [OS-5.2] Event-related potential correlates of language change detection in toddlers. *Jan Rouke Kuipers & Guillaume Thierry*

12:30-12:50 [OS-5.3] The nature of second language acquisition abilities. *Ines Anton-Mendez, William L. Coventry, Elizabeth Ellis, Brian Byrne*

13:00-15:00 Lunch & Poster Session 2

15:00-16:00 Keynote lecture 5 [KL-5]

Anatomical correlates for language processing in multilinguals. Vincent Lubrano, CHU Toulouse

16:00-16:30 Coffee break

16:30-17:30 Oral Session 6 Syntactic processing

16:30-16:50 [OS-6.1] Transfer types in the acquisition of French noun phrase structure by Spanish-Speaking children. *Ève Bergeron & Phaedra Royle*

16:50-17:10 [OS-6.2] Articles in real-time language comprehension. *Danijela Trenkic, Jelena Mirkovic, Gerry Altmann*

17:10-17:30 [OS-6.3] Grammatical gender processing in L2 Spanish: Eye tracking evidence from L1 speakers of Italian and English. *Paola E. Dussias, Jorge R. Valdés Kroff, Chip Gerfen*

17:30-18:00 Close of Conference: Closing remarks. F.-Xavier Alario, Alice Foucart

[PS-1.1] Do bilinguals and multilinguals have larger social networks than monolinguals? *Charlotte Kemp*

[PS-1.2] Overcoming phonological deafness in L2 conversations by perceiving the facial movements of the speaker. *Sabine Burfin, Christophe Savariaux, Lionel Granjon, Carolina Sanchez, Thi Tuy Hien Tran, Salvador Soto Faraco, Sonia Kandel*

[PS-1.3] Grapheme coding in L2 learners. *Eva Commissaire, Lynne G. Duncan, Séverine Casalis*

[PS-1.4] Counterfactual thinking in French as an L2 by Italian bilinguals: when the use of conditional tense fills a representational gap. *Isabel Repiso*

[PS-1.5] Full cued Full learning of a second language grammatical gender system: evidence from ERP's. *Haydee Carrasco-Ortiz, Cheryl Frenck-Mestre*

[PS-1.6] Proficiency effects on the organization of the bilingual lexicon. *Michele Burkholder, Christie Brien, Laura Sabourin*

[PS-1.7] The cognate facilitation effect is modulated by the word frequency of both readings: behavioral and electrophysiological evidence. *David Peeters, Ton Dijkstra, Jonathan Grainger*

[PS-1.8] Cognate word recognition: the role of orthographic and phonological similarity in two different tasks. *Sofia Frade, Montserrat Comesaña, Ana Paula Soares, Andreia Rauber, Ana P. Pinheiro, Rosa Sánchez-Casas*

[PS-1.9] Interlingual competition in a spoken sentence context: Evidence from the visual world paradigm. *Evelyne Lagrou, Robert J. Hartsuiker, Wouter Duyck*

[PS-1.10] How experience reshapes perception: the case of non-native vowel contrasts in late bilinguals. *Pauline Peri, Christine Meunier, Cheryl Frenck-Mestre*

[PS-1.11] The role of proficiency in L2 processing of grammatical gender: Evidence from ERP. *Hanneke Loerts, Laurie A. Stowe, Monika S. Schmid*

[PS-1.12] The expression of motion events in bilingual first language acquisition. *Helen Engemann*

[PS-1.13] How do Basque-Spanish bilinguals handle gender in code-switching? *M. Carmen Parafita Couto, Amaia Munarriz, Irantzu Epelde, Margaret Deuchar, Bernard Oyharcabal*

[PS-1.14] Cognitive bilingualism and social bilingualism, two dimensions of a same fact: The case of French - Creole bilingual children. *Mélissa Arneton*

[PS-1.15] Crosslinguistic effects of salience and syntactic function assignment in sentence planning. *Ines Anton-Mendez, Henry Gerfen, Miguel Ramos*

[PS-1.16] Interference of German (L1) grammatical gender on pronoun resolution in English (L2) sentence processing. *Anna Renner, Katharina Spalek*

[PS-1.17] Masked translation priming in late unbalanced bilinguals: Evidence from RTs, ERPs and fMRI. *Sofie Schoonbaert, Robert J. Hartsuiker*

[PS-1.18] Using one language can both hamper and help production of translations in another language. *Elin Runnqvist, Kristof Strijkers, Albert Costa*

[PS-1.19] Reading aloud in Persian: ERP evidence for an early locus of the MOPE. *Kalinka Timmer, Narges Vahid-Gharavi Narges, Niels O. Schiller*

[PS-2.1] Comprehension of relative clauses in a Spanish-Basque bilingual with aphasia. *Amaia Munarriz, M. Juncal Gutierrez-Mangado*

[PS-2.2] Gestures of future teachers in vocabulary explanations to non-native speakers. *Marion Tellier, Gale Stam*

[PS-2.3] Sentence repetition in bilingual language testing and automaticity of sentence processing. *Sandra Kuhn, Ralf Rummer, Judith Schweppe*

[PS-2.4] Developing mutual exclusivity in the lab. *Sean Roberts*

[PS-2.5] Translation priming and cross-language semantic priming in bilingual infants. *Pia Rämä, Louah Sirri*

[PS-2.6] Language discrimination in monolingual and bilingual infants of Spanish and Basque. *Monika Molnar, Manuel Carreiras, Judit Gervain*

[PS-2.7] On the effects of a brief L2 immersion on executive control. *Cristina Baus, Albert Costa, Manuel Carreiras*

[PS-2.8] Paying attention to reading direction: English versus Hebrew strategies among bidirectional/bilingual readers on cancellation tasks. *Seta Kazandjian, Ari Z. Zivotofsky, Sylvie Chokron*

[PS-2.9] Cognitive control and lexical selection during monolingual development. *François-Xavier Alario, Bruno De Cara, Stéphanie Massol, Johannes C. Ziegler*

[PS-2.10] Bilingual disadvantage and frequency effects in language production revealed by ERPs: Evidence from Spanish monolinguals and Spanish-Basque bilinguals. *Ian FitzPatrick, Kristof Strijkers, Mikel Santesteban, Albert Costa*

[PS-2.11] The effect of L1 syntax on the agreement of L2 possessive structures: Evidence from eye-tracking. *Alice Foucart, Holly Branigan, Martin Pickering, Mikel Santesteban*

[PS-2.12] Bridging linguistics and cognitive neuroscience: An event-related potential study of code-switching. *Bastien Boutonnet, Peredur Davies, Noriko Hoshino, M. Carmen Parafita Couto, Yanjing Wu, Margaret Deuchar, Guillaume Thierry*

[PS-2.13] Masked translation and repetition priming effects in trilinguals. *Xavier Aparicio, Jean-Marc Lavaur, Jonathan Grainger, Katherine J. Midgley*

[PS-2.14] Differences and similarities in automatic syntactic processing in native and nonnative speakers of English. *Carrie A. Ankerstein*

[PS-2.15] Ineffective L2 parsing and developing L2 grammars: an eye-tracking study on auxiliary selection in L2 Italian. *Stefano Rastelli*

[PS-2.16] The bilingual advantage: Conflict monitoring, cognitive control, and garden-path recovery. *Susan E. Teubner-Rhodes, Alan Mishler, Ryan Corbett, Llorenç A. Barrachina, Monica Sanz-Torrent, John C. Trueswell, Jared M. Novick*

[PS-2.17] Bilingualism and executive control: The role of switching. *Nele Verreyt, Davy Vandelanotte, Wouter Duyck*

[PS-2.18] The role of input in bilingualism: are there downsides? *Mila Vulchanova, Valentin Vulchanov, Dinara Sarzhanova, Hendrik Eshuis*

ABSTRACTS

Linguistic and computational contributions to non-convergence in late L2 acquisition

Holger Hopp

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Recent electrophysiological and psycholinguistic studies attest that highly-proficient late L2 learners *can* converge on the target morphosyntax in L2 processing. At the same time, even the most highly-proficient L2 speakers do not necessarily show convergence.

In psycholinguistics, the finding that late L2 learners do not attain native-like processing has been related either to representational differences between non-native and native grammars or to capacity differences in processing. In this talk, I will present a series of reaction-time and eyetracking experiments on advanced to near-native late L2 learners of German and English that assess the relative contributions of linguistic and capacity factors to non-convergence.

A set of self-paced reading and speeded judgment studies on L1 English, Dutch and Russian near-native speakers of German shows that the L2 processing of morphosyntax is modulated by L1 effects in that L1 properties predict the robustness of target-like processing as task demands rise. In a follow-up study, a similar relation between task demands and target-like processing could be demonstrated for native speakers processing their L1 under stress. Seen in conjunction, these findings suggest that residual non-convergence in L2 morphosyntax may largely be due to computational rather than representational differences between non-natives and natives. In order to delineate the contribution of computational factors more precisely, I will present preliminary results from an ongoing study that relates difficulties in resolving local subject-object and non-local relative clause attachment ambiguities in L2 English processing to differences in proficiency, working memory, automaticity in sentence integration, and the speed of lexical recognition in the L2. I will discuss the findings in the context of current psycholinguistic theories of representational deficits and computational difficulties in adult L2 acquisition.

Adaptive listening: the case of foreign accents

Andrea Weber

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In foreign-accented speech, we are confronted with a speech signal that reflects language-specific structures from a second language. Understanding thus requires the speech system to adapt to non-native pronunciation variations that often disagree with the structure of our native language. In this talk, I will present recent findings of my ongoing research on the comprehension of foreign-accented speech. Current research questions concentrate on the prerequisites of adaptation, its time-course, and stability.

Sign Language and the Bilingual Mind

David Corina

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Studies of naturally occurring signed languages used in Deaf communities have greatly enriched our understanding of the human capacity for language. Recent studies have begun to examine bilingualism in the context of deaf and hearing users of signed languages. These studies are important because they hold the potential to assess the role of language modality in shaping the bilingual mind. In this talk we review some emerging findings from this new literature and critically evaluate recent claims related to language transfer and executive function in ASL-English bilinguals. We argue that several important factors inherent in multi-modal bilingualism have not been adequately addressed and the desire to fit these new findings within existing models that have been developed for spoken language bilingualism may be premature.

Normal and pathological language control in bilinguals

David Green

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Diverse phenomena point to the need to understand the nature of language control in bilingual speakers. Can we give a unified account? I think so. Do we have one yet? No. We know some of the neural regions involved based on functional imaging and neuropsychological data. Control is achieved through the working together of frontal-subcortical and cerebellar structures. Such a network of regions underlies language control in monolingual speakers too.

Thinking about how control works leads us to assess the dichotomy between language processes and non-language processes. The interplay between representational and control processes is deep ranging from the conceptual to the sensori-motor. It leads us to consider how the contexts of acquisition, and the ecology in which bilingual speakers operate, shape the system. Such consideration leads to further questions: What is the nature of the variety created? How does this variety affect the process of language control and the pattern of deficit following stroke? And, ultimately, how may we think about this question productively so that we can develop a unified account?

Anatomical correlates for language processing in multilinguals

Vincent Lubrano

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Although considerable data has been accumulated on human language organization, the brain representation of language in multilingual persons remains controversial. Schematically, one of the main issues sustaining the debate is to know whether the processing of different languages involves the same anatomical areas represented within one single system, or whether each language constitutes an independent system relying on distinct anatomical areas. Second basic question concerns the neural correlates of language switching, that is, the areas that are active when bilinguals switch from one language to the other.

Since clinical studies have shown that bilingual aphasics do not necessarily manifest the same language disorders with the same degree of severity in both languages, neurosurgeons who operate multilinguals use intraoperative language monitoring under awake craniotomy and recommend intraoperative testing of all languages in which the patients are fluent in. We make a critical review of surgical mapping results obtained by us and other different teams using this technique.

We will also highlight methodological issues relevant to intraoperative investigations of languages processing and switching, and discuss what can be learned from these direct intraoperative brain mapping studies in multilingual patients comparing the data obtained from this technique to those obtained from other mapping techniques and particularly functional neuroimaging.

Case or postposition? The brain can tell the difference: an ERP study on morphological processing in natives and near-natives

Adam Zawiszewski, Kepa Erdocia, Mikel Santesteban and Itziar Laka

Bilingual Mind Group, Psycholinguistics Laboratory ,University of the Basque Country, Spain

Several ERP studies argue that native/non-native language processing differences result from either language proficiency age of acquisition (AoA) or involve transfer from L1, but the interplay of these factors is still not well understood.

We present results from an Event-Related Potentials (ERP) study on morphological processing in Basque where native/non-native differences obtain at high levels of overall language proficiency and early AoA depending on the nature of the argument: only native speakers showed significant differences between case and postposition in the later stages of processing (700-900 ms).

We conducted a study where the experimental grammatical and ungrammatical conditions were (i) ergative case, (ii) dative case and (iii) allative postposition (examples 1-3):

1. Liburua ekarri dio neska-ri goizean *irakaslea-k /*irakaslea* klase-ra.
   Book-ABS brought girl-DAT morning teacher-ERG /*ABS classroomALL
2. Liburua ekarri dio irakasle-ak goizean *neska-ri /*neska* klase-ra.
   Book-ABS brought teacher-ERG morning girl-DAT/*ABS classroomALL
   This morning the teacher brought a book to the classroom for (to) the girl.
3. Liburu berria ekarri du goizean *klase-ra /*klasea* irakasle-ak.
   Book new-ABS brought morning classroom-ALL /*ABS teacher-ERG
   This morning the teacher brought a new book to the classroom.

The ungrammatical sentences (*) contained a noun lacking the required ergative and dative case markers or the allative postposition.

23 L1Basque/L2Spanish and 23 near-native L1Spanish/L2Basque bilinguals (AoA=3years) participated in the study. ERPs (59 electrodes, impedance kept below 5kOhms, digitalization rate 250 Hz) were registered while the participants were reading grammatical and ungrammatical sentences (word-by-word, 350 ms, ISI= 250) and performing a grammaticality judgment task.

Results showed that natives committed significantly less errors and responded faster than non-natives in detecting the ungrammatical stimuli in all conditions. As for the ERPs, at the critical word position both groups displayed a similar N400 component (300-500 ms) towards ergative and dative case violations, but no response to the allative postposition violations was observed. In the later phase of processing (700-900 ms) all violations elicited a comparable P600 component. A significant CONDITION x ANTERIORITY x GROUP interaction was found in the same time window indicating differences between natives and near-natives. Subsequent manova analyses revealed a significant contrast between the postposition condition as compared to ergative and dative case conditions (central sites of the scalp) only in the native group, but not in the near-native group.

In sum, our data indicate that native and non-native processing strategies diverge at later stages of processing (700-900 ms) depending on the syntactic nature of the argument involved, that is, where native speakers make the distinction between cases and postpositions.

Proficiency and Working Memory Effects in the L2 Processing of Short and Long Subject-Verb Agreement Dependencies: Evidence from Event-Related Potentials

Robert V. Reichle [1], Annie Tremblay [2], Caitlin Coughlin [2]

[1] Northern Illinois University, DeKalb, IL, USA
[2] University of Illinois at Urbana-Champaign, Champaign, IL, USA

Late second/foreign language learners (L2ers) have difficulty processing inflectional morphology even when the morphological feature is instantiated in the native language (L1). Three theories (among others) have sought to explain this: (i) Ullman's [1] Declarative/Procedural model, which stipulates that L2ers initially store inflected words as single units in declarative memory, only later (i.e., with increasing proficiency) relying on the procedural system; (ii) Clahsen and Felser's [2] Shallow Structure Hypothesis, which claims that L2ers have difficulty computing non-local (agreement) dependencies; and (iii) McDonald's [3] cognitive account, according to which L2ers' variable processing of inflectional morphology stems in part from their limitations in working memory (WM) capacity. Whereas (ii) and (iii) assume that L2ers' and native speakers' (NSs') processing of inflectional morphology are, respectively, qualitatively and quantitatively different, (i) proposes a qualitative-to-quantitative-difference shift during L2 development.

This study sheds further light on these theories by examining the electrophysiological brain responses that the processing of (in)felicitous (non-)local subject-verb agreement dependencies elicits for late French-English bilinguals with either French or English as L1, and the relationship between these responses and L2ers' proficiency and WM capacity in both languages. Mid-to-high-proficiency L2ers completed reading tasks in French and English during which ERPs were measured. The L2ers read 120 sentences containing (in)felicitous agreement between (non-) adjacent subjects and verbs. The French task used regular *–ir* verbs in the present-tense third-person-plural form, for which agreement is instantiated phonologically; the English task used regular present-tense third-person-singular verb forms. In both languages, the infelicitous verbs were unmarked. The participants also completed reading-span tasks in French and English and cloze tests in French and English for proficiency assessment.

Preliminary results of 10 English NSs on the French task revealed an N400 effect for infelicitous verbs ($p<.05$); this effect did not interact with the length of the agreement dependency. Significant ($p<.05$) and marginally significant ($p<.1$) negative correlations were also found between the size of the N400 effect and, respectively, L2ers' percent use of French and their reading span in French. By contrast, results on the English NS task revealed a P600 effect for infelicitous verbs ($p<.05$) for electrodes F3,Fz,F4; this effect did not interact with the length of the agreement dependency. These preliminary results suggest that English NSs process French and English inflectional morphology in a qualitatively different way, but the decrease in N400 effect as proficiency and WM increase suggests that their processing routines may be changing toward the development of a P600 effect. These results are consistent with (i) and with recent L2 ERP findings [4].

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The temporal dynamics of second language acquisition: The role of AoA, L2-proficiency, L1-transfer and training environment as reflected by ERPs

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Language acquisition in childhood is less effortful than in adulthood. These differences are often explained in terms of a 'critical' or 'sensitive' period early in life, after which maturational changes in brain plasticity prevent second language (L2) learners from relying on the same neuro-cognitive mechanisms as native speakers do. While the Critical Period Hypothesis (CPH) initially received support from various behavioral and brain imaging studies [4,5,7,9], these studies typically either confounded age of L2 acquisition (AoA) and L2 proficiency or have other methodological problems (e.g., some of them failed to create the intended linguistic violations). Recent work avoiding these problems has cast new doubt on the CPH, especially in the domain of morpho-syntax.

Event-related brain potentials (ERPs) provide an excellent tool to investigate the temporal dynamics of language processing, including the fascinating neural changes that take place when language learners become more proficient in their L2. In my talk, I will present data from a variety of large-scale ERP studies investigating second language acquisition in both artificial languages ([3,6]) and natural languages, at different levels of L2 proficiency ([1,9,10]). I will demonstrate that there is little evidence for a strict critical period in the domain of late acquired L2 morpho-syntax and that L2 proficiency rather than age of language acquisition predicts the brain's activation patterns, including "native-like" activity at very high levels of proficiency (e.g., LANs + P600s for syntactic word category violations). Moreover, unlike [2], I will argue that a strict distinction between linguistic structures that late L2 learners can versus cannot learn to process in a native-like manner may not be warranted. Instead, morpho-syntactic real-time processing in general seems to undergo dramatic, but systematic, changes with increasing proficiency [8]. The general dynamics of these changes, however, is modulated by factors such as one's first language background (e.g., Francophone vs. Chinese learners of English) and the type of language exposure (e.g., immersion versus classroom instruction; [6]). In my conclusion, I will outline how future ERP research can further advance our understanding of language learning.

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The balance in unbalanced bilingualism: Automatic co-activation of translations across different types of unbalanced bilinguals

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Translations without any formal overlap (i.e., non-cognates) and their shared concept are effectively activated even when one of the two translations is presented subliminally, namely under masked priming conditions. This non-cognate masked translation priming effect has been so far reported in almost all the lexical decision studies testing bilinguals with a clear language dominance (i.e., unbalanced) revealing a remarkably stable pattern: the activation of the cross-language lexico-semantic links is more effective when the masked prime is a word in the dominant language (L1) and the target its non-cognate translation in the non-dominant language (L2) than vice versa. Interestingly, this pattern of masked translation priming effects, termed as the *non-cognate masked translation priming asymmetry*, vanishes when simultaneous and balanced bilinguals (i.e., bilinguals with a comparable linguistic history in both of their languages) are tested. This change in the pattern of masked translation priming effects suggests that the linguistic profile of the bilinguals could be critically involved in the way cross-language lexico-semantic activation takes place across the bilingual lifespan. The present study aims to identify which out of the two variables differentiating balanced from unbalanced bilingualism renders the otherwise asymmetric cross-language activation of translations into symmetric, *L2 proficiency* or *age of L2 acquisition*. To this end we performed a series of lexical decision experiments examining the pattern of non-cognate masked translation priming effects with different groups of unbalanced bilinguals differing exclusively either at a) their level of L2 proficiency or at b) their age of L2 acquisition. The impact of L2 proficiency was first explored. Three groups of Greek (L1)-English (L2) unbalanced bilinguals, matched in everything but their level of English proficiency (i.e., low, medium, high), performed lexical decisions on the same sets of L1 and L2 words. The second part of the study examined the influence of age of L2 acquisition. Two groups of Spanish (L1)-Basque (L2) unbalanced bilinguals were tested on the same Spanish and Basque materials. The groups were matched in everything but the age at which they had started learning Basque (i.e., almost simultaneously with Spanish or after the age of 6). Results regarding the impact of L2 proficiency were clear-cut: although increased L2 proficiency led to improved overall performance, the masked translation priming effects obtained across the three groups were virtually identical yielding in all cases significant but asymmetric masked translation priming effects (i.e., larger effects in the L1→L2 translation direction). Contrarily, age of L2 acquisition was found to modulate the pattern of effects with unbalanced bilinguals who had acquired their second language very early in life showing a more symmetric pattern of masked translation priming effects, similar to the one previously reported with balanced bilinguals. Overall, these findings pose important constraints on the mechanisms of development of the lexico-semantic links of bilinguals and the way these mechanisms have been proposed to function by the existing models of bilingual lexico-semantic organization.

ВИНО (‘wine’) is affected by ВЕРА (‘faith’) but not by BOOT: An ERP investigation of L2 to L1 influence during reading aloud

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Participants read *CARPET* [kɑrpət] faster when it is preceded by a phonologically related prime (e.g., *kernel* [kɛrnəl]; O–P+) than an unrelated prime (e.g., *powder – CARPET*; O–P–). In contrast, no priming effect is observed for orthographically related prime-target pairs (e.g., *circus* [sırkəs] – *CARPET* [kɑrpət]; O+P–). This is the so-called *masked onset prime effect* (MOPE) and considered to be phonological in nature [2]. The MOPE has often been replicated in first language research [2, 3, 4, 5]. Further, Brysbaert and colleagues (1999) also showed that second language (L2) words could be primed by homophonic words of the first language (L1; [1]), thus showing that L1 can influence L2. In the present study, we investigated whether phonological priming is present during a task in your L2. Bilingual Russian (L1) – English (L2) participants read aloud words in their L2 that were primed by L2 words. In addition, we investigated whether L2 phonology can affect reading of L1 words. The same group read aloud L1 target words primed with either L1 or L2 words. In Russian and English there are five graphemes (i.e. <P>, <H>, <X>, <C>, <B>) that share the same orthographic symbol, but have different phonological representations (pronounced in Russian as /r/, /n/, /h/, /s/ and /v/, respectively). This conflicting situation in grapheme-to-phoneme mapping offers the possibility to disentangle the phonological activation of two languages. The L2 task revealed phonological priming, but no orthographic priming, which is in accordance with L2 research. The L1 task revealed, for the Russian primes, 11 ms faster response latencies in the O+P+ condition (e.g. ВЕРА /'vʲerə/ ‘faith’ - ВИНО /vʲınо/ ‘wine’) than in the O-P- condition (e.g. ТЕМА /'tʲemə/ ‘topic’ - ВИНО /vʲınо/ ‘wine’). For the English primes, response latencies between the O+P- condition (e.g. BOOT - ВИНО /vʲınо/ ‘wine’) and the O-P- condition (e.g. TAPE - ВИНО /vʲınо/ ‘wine’) did not differ. These results suggest that the language of the prime was correctly identified because phonological priming for the Russian primes (O+P+ vs O-P-) is expected, and orthographic priming for the English primes (O+P-) is not expected based on previous monolingual research [3, 4, 5]. When the English primes would be read as Russian non-words, the phonology would overlap and a priming effect would be expected. The results demonstrate that English phonology is also activated in Russian participants, even when they are in their native monolingual environment, and are less familiar with the orthography of the L2. In addition, the results provide additional support for non-selective models of bilingual reading which assume automatic activation of the non-target language phonology even when it is not required by the task.

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Please, Catalan or Spanish, but not both! Are bilinguals fully in control of their language selection during word production?

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When we are used to speak one language with someone, we usually feel uncomfortable speaking with him/her in another language. This leads bilingual speakers to have singular conversations in which they switch the language continuously (as, for example, three bilingual speakers: speaker A speaking one language with speaker B and the other one with speaker C). These surprising conversations happen regularly in bilingual communities even if switching between languages has certain cognitive costs. We hypothesise that these singular conversations might be due to strong bottom-up effects originating from the stimulus-response binding between familiar faces and their associated language. Overriding this learnt link (that is, speaking with someone in another language than the usual one) might, according to our hypothesis, require costly top-down effects.

To test this hypothesis, we performed a language production task primed by familiar faces. Spanish-Catalan bilinguals were familiarised by means of interactions with twelve actors, six Catalan- and six Spanish-speakers. In the test phase, participants were presented with an actor producing a noun and were instructed to produce a semantically related verb, in the same language as the one used by the actor. Crucially for our purposes, actors were producing the nouns in the language they used during the habituation phase (congruent) or in the other language (incongruent). Considering only trials without language switch, participants were significantly slower to produce language in the incongruent condition, suggesting that incongruity in the face-language binding carries some cognitive costs.

This observation might have important implications for language control in bilingualism: Bilinguals might not fully control their language production as language selection is highly driven by bottom-up information coming from external cues such as familiar faces.

Are L2 perception and production correlated?

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The relation between perception and production in non-native phonological processing has been investigated with a variety of methods in various types of population. Studies with bilinguals have found a moderate correlation between the perception and the production of L2 segmental contrasts [1,2,3]. However, the correlation seems to be restricted to certain measures [4], and perception and production skills for L2 contrasts develop differently [5].

We investigated the relation between L2 perception and production in French-English bilinguals who have learned English in school and who live in France but regularly use English. Our focus was on the production of the vowels /I/ and /i/ and on the perception of the contrast between these two vowels; French has no vowel /I/, and this vowel is typically confused with /i/ in both production and perception.

Participants performed both a sentence reading task and an ABX discrimination task. The production task yielded an accuracy score for the pronunciation of the vowels /i/ and /I/, as well as a global nativelikeness score (provided by native English judges). The perception task compared the discrimination of the /I/-/i/ contrast to that of a control contrast /I/-/u/, using trisyllabic non-words (e.g. test: drickering - dreekering, control: drickering - drookering); this task yielded individual test minus control error rates. The relation between production and perception was examined by means of correlation analyses.

We found, first of all, that pronunciation accuracy for the vowels /I/ and /i/ correlated with global nativelikeness (r^2=.65, p<.0001). Moreover, both production measures correlated with self-estimated pronunciation skills (nativelikeness: r^2=.69, p<.0001; /i,I/ accuracy: r^2=.44, p<.004). However, performance on the perception task did not correlate with either /I,i/ pronunciation accuracy (r^2=0) or global nativelikeness (r^2=-.06, p>.1).

The lack of a correlation between perception and production contrasts with findings in previous studies with L2 learners. We hypothesize that this is due to the fact that for perception we used a speeded ABX discrimination paradigm with a small ISI. In this task, participants cannot loop through their production module when processing the stimuli and making a decision as to their response. By contrast, all of the previous studies that found a perception-production correlation used either an off-line task or on-line discrimination with a large ISI. Thus, we suggest that the correlation between perception and production in L2 phonological processing depends upon the possibility to use the phonological loop during perception, and in particular, to subvocally rehearse the stimuli.

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An fMRI study of changes in sensorimotor control in response to learning to produce non-native speech sounds

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Articulatory movements necessary for producing native speech sounds are highly over-learned and automatic. In contrast, those necessary for non-native phonemes are unfamiliar. Our hypothesis was that this would result in greater dependency on the function of sensorimotor systems, and that activity in part of this network would decline with practice. Our previous work has shown that regions involved in integrating motor feedforward signals with sensory feedback are more active during non-native speech production, even in proficient bilinguals, relative to native speech. This study used a prospective training fMRI paradigm to explore the functional importance of increased sensorimotor activation for producing non-native speech sounds, and the plasticity within this system with a short period of training. The 22 subjects were monolingual native speakers of English. They were scanned both before and after a week of training in producing these non-native phonemes. The experimental tasks in each fMRI scanning session required subjects to listen to and repeat a range of non-native words, as well as native non-words. The out-of-scanner training consisted of self-paced, computer-based training, which was carried out for approximately one hour a day over five days in between the two scanning sessions. The training introduced subjects to articulatory anatomy in general, before focusing on the non-native speech sounds specifically. Audiovisual material enabled the subjects to listen to and observe native speakers producing the words and were instructed how to move their articulators specifically in order to produce each sound, and the training required them to practise saying the words repeatedly. Subjects were not taught the meaning of the words. These novel sounds varied systematically in place of articulation and in level of difficulty relative to English phonemes. All the words were bisyllabic and each language group manipulated only one aspect of articulation, by using Spanish consonants, German vowels and Mandarin tones. Subjects' speech was recorded on-line during the two fMRI scanning sessions, as well as throughout the training process, and the speech recordings were assessed by native speakers of the languages included in the study. This allowed us to observe how the sensory regions of the brain changed their activity with training, and whether the amount of measured brain activity faithfully reflected the actual proficiency achieved. Familiarity with non-native speech sounds led to modulation of activity within the network of regions involved in the motor feedforward and sensory feedback production of speech. Non-native speech resulted in higher activity than native non-words and this difference reduced after training. Region of interest analyses revealed dissociation of activity across the three groups of speech sounds. The data from this study have revealed the plasticity within cortical and subcortical regions that are central to acquisition of non-native speech production.

Phonological co-activation of both languages in bilingual speech production

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One question in bilingual language production is whether the language not currently spoken is activated during speech planning. Previous studies [e.g., 1, 2, 3, 4, 5] suggest that this is the case. All of these studies, however, either used both languages of the bilinguals during the experiment and/ or they used special items like cognates or employed meta-linguistic tasks.

In the present study, we investigated the question of phonological co-activation with a pure speech production task that was carried out exclusively in our participants' L2 English. Participants were 17 late but highly proficient German-English bilinguals currently immersed in an English speaking environment. We collected event-related potentials (ERPs) while they named coloured line drawings in their L2, using adjective–noun dyads, e.g., blue bird. The onset of adjectives and nouns could overlap in English (L2-overlap, e.g. blue bird vs. green bird) or in German, the speakers' native language, which was not produced during the experiment (L1-overlap, e.g., red skirt –'roter Rock' vs. blue skirt –'blauer Rock'). Behaviourally, L2-overlap sped up the naming latencies, while there was no difference in the reaction times for overlapping and non-overlapping conditions in L1. By contrast, in the ERPs, a similar pattern was present for both cases of overlap. In the overlapping conditions, we observed a more positive going waveform at frontocentral electrodes in the N400 range (280 to 500 ms). Strikingly, however, ERPs in the overlapping and non-overlapping conditions in L1 diverged about 100 ms earlier (~ 315 ms after stimulus onset) than ERPs in the overlapping and non-overlapping conditions in L2 (~ 420 ms after stimulus onset).

In sum, the data not only show that L1 phonology is activated during L2 speech production, but they also show that phonological information of the L1 is available earlier than that of the L2, even in the case of proficient speakers and even when only L2 production is required in the course of the experiment. This finding is compatible with a model of bilingual language production in which activation cascades from an activated concept to the phonological representations of both languages.

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Lexical processing is delayed by 100 ms in a second language

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The temporal delay assumption of the BIA+ model [1] states that lexical access is delayed in bilinguals' second language (L2) compared to their first (L1) due to lower proficiency. The reduced frequency hypothesis [2] proposes that bilinguals' use of multiple languages leads to reduced frequency of use and therefore weaker language ties in the L1 compared to monolinguals. However, as it is a language production hypothesis, it is unclear whether the reduced frequency hypothesis extends to word recognition studies, predicting slower lexical access in bilinguals' L1 compared to monolinguals. Previous EEG studies investigating lexical processing speed have either not tested monolinguals against both languages of bilinguals [3], and/or have focused on later semantic components like the N400 [4]. We investigate these two hypotheses of lexical processing speed in the context of automatic reading by directly comparing monolinguals and bilinguals in L1 and L2 using concurrent EEG. We focus on an early orthographic recognition component, the N170, which is sensitive to language proficiency [5]. The Stroop task is used as a measure of automatic word processing, with long-latency stimulus onset asynchrony (SOA) variation (-400, 0, +400 ms) to gain additional temporal information on lexical processing in native and second languages. Experiment 1 tested monolingual English speakers on an English Stroop task with EEG recording. Experiment 2 tested Chinese-English bilinguals on Chinese (L1) and English (L2) Stroop tasks in separate sessions. All bilinguals were native Chinese speakers with a late age of English acquisition (mean 11 years) and a self-rated English proficiency of 7/10. All three groups showed an N170 following word presentation in all SOAs, demonstrating the automaticity of word reading even in a second language. At the N170 peak, monolinguals and bilinguals' L1 showed differences in the symbol string control condition ('%') relative to word conditions. In the L2, words and symbol strings were distinguished later, on the downslope of the N170 peak. To directly compare the groups, difference waves (incongruent minus symbol string) were computed for each group and SOA. The difference waves showed peaks at 170 ms for monolinguals and bilinguals' L1, reflecting lexical distinction at the N170 peak. These peaks did not significantly differ in latency, indicating no difference in lexical processing speed between bilinguals' native language compared to monolinguals. The bilingual L2 lexical distinction peak, however, occurred significantly later (100 ms) compared to both the L1 and monolinguals in all SOAs and despite repetition effects, suggesting a robust delay in lexical processing. Thus monolinguals and bilinguals' L1 showed no latency differences in lexical processing, suggesting that the reduced frequency hypothesis does not hold for bilingual word recognition. The L2, however, experienced significantly delayed early lexical processing, supporting the temporal delay assumption and confirming that a second language is significantly delayed due to reduced proficiency and frequency of use.

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Semantic interference is cumulative across languages: implications for models of bilingual speech production

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Several studies have shown that concepts automatically spread activation to words of both languages of a bilingual. Therefore, a central issue that needs to be clarified in the study of bilingual speech production is by what means speakers are able to restrict the linguistic output to the intended language of communication. Many researchers have assumed that in order to speak in one language, the other language has to be inhibited (i.e., the ICM of Green, 1). Others have proposed that bilingual speakers are able to focus only on the language that is relevant for communication (i.e., the language-specific selection hypothesis of Costa and colleagues, 2). In this study, both of these proposals were tested in a series of experiments using the cumulative semantic interference effect (CSIE; 3, 4) as a window into lexical processing and cross-linguistic interactions. The CSIE refers to the observation that naming pictures that belong to the same semantic category entails a constant increase in RTs with each new naming event. In a context where response language is alternated among categorical members, the ICM predicts a null effect both within and across languages, while the language-specific selection hypothesis only predicts a within-language effect. The main finding we observed in these experiments was that semantic interference is cumulative across languages, and this cross-linguistic CSIE was of the same magnitude as the within-language effect. This result cannot be accounted for by any of the above mentioned proposals of bilingual language control.

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Early orthographic effects in spoken word recognition with non-dominant bilinguals depend on proficiency level

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It has been shown that orthographic information is activated during L1 spoken word recognition [e.g. 1]. We conducted two cross-modal masked priming experiments to investigate the extent to which L1 (Finnish) and L2 (French) orthography affects French spoken word recognition in non-dominant bilinguals. Visual prime exposure in both experiments was 67ms. The age of acquisition, competence level and exposure of the 75 Finnish participants were controlled for French and used to divide the participants in three proficiency level groups. An off-line target familiarity rating task was used to estimate the subjective frequency of each target word for each participant.

Experiment 1, a partial replication of Grainger et al. [1; exp. 4 and 5], assessed whether the orthographic facilitation effect obtained with monolingual French participants would generalize to non-dominant bilinguals. Auditory targets were monosyllabic French words. Visual primes were 1) repetitions (stage [staʒ] - [staʒ] 'course') 2) nonword pseudohomophones (staje [staʒ] – [staʒ]) and 3) nonword controls (bleur [blœʀ] – [staʒ]). The results showed a significant facilitative effect in the repetition condition ($p < .001$) which also produced significantly less errors ($p < .001$). There was a further facilitative effect of the pseudohomophone condition ($p < .05$). The magnitude of the repetition effect depended on the proficiency level: when analyzed separately, the effect was most significant in the high proficiency group.

Experiment 2 tested whether L1 orthography would exert a similar effect in L2. Auditory targets were 1-2 syllable French nouns. Finnish-based visual primes were 1) semantically unrelated words with orthographic – but not phonological – onset overlap (fi: huivi [huivi] 'scarf' - fr: [ɥil] huile 'oil'), 2) pseudohomophones with L1 grapheme-phoneme correspondences (fi: yil [yil] 'nonword' - fr: [ɥil]) and 3) control words with no orthographic or semantic overlap with the target (fi: saate [saate] 'covering note' - fr: [ɥil]). The primes in conditions 1 and 3 were matched with the targets for frequency and syllable length. There was a marginal facilitative effect of the pseudohomophone condition ($p < .06$). Moreover, when analyzed separately, a facilitative orthographic effect was observed in the high proficiency group ($p < .05$). This effect was qualified by a marginal interaction with the familiarity of the targets. These effects were not observed in the lower proficiency groups.

The results showed that the repetition effect was dependent on the participants' overall L2 proficiency. Also, L1 orthography facilitated L2 spoken word recognition only in the high proficiency group. This suggests that in non-dominant bilinguals the extent to which orthographic information affects speech perception depends on their proficiency in L2.

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Neighbourhood density and the development of lexical entries in bilinguals

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Lexical access in bilinguals is still one of the big mysteries in the field of psycholinguistics. One way of looking at this mystery is to try to understand how lexical entries are developed and stored in the second language learner. It is the aim of this paper to examine the development of lexical entries in a second language by looking at neighbourhood density. The neighbour of a word can be defined as a word that differs by one letter or one phoneme from a target word by substitution, addition or deletion (e.g. heir – HAIR, hose – HOUSE, hunt - HUT). A neighbourhood, then, is the total number of neighbours that surrounds a given target word. The tuning hypothesis [1] claims that words from high density neighbourhoods are re-coded to reduce competition. If true, this explains why words from low density neighbourhoods show form priming effects, while words from high density neighbourhoods generally – depending on stimuli characteristics e.g. subsyllabic units or onsets [1] - do not tend to generate form priming effects in either word recognition or naming tasks. This re-coding based on neighbourhood density is ultimately driven by one's vocabulary, as can be seen by the presence of orthographic form priming in adult high density neighbourhood words for young children, but not for older children and adults. As words in a second language are acquired, words either have to be integrated into an existing lexicon or build up a new, second lexicon. L1 neighbourhoods appear to influence bilingual language processing [e.g. 2], suggesting a common lexicon. Investigating neighbourhood effects through form priming in bilinguals could tell us more about this process. In order to investigate lexical tuning when it comes to speaking a second language, we have first tested whether the lexical tuning hypothesis holds true by using form primed picture naming in monolinguals. We also used a new, less restrictive measure of neighbourhood density, the PLD20 [3] based on the Levenshtein distance (LD). As predicted, pictures with low density names showed a stronger form priming effect than pictures with high density names. In order to investigate neighbourhood effects in bilinguals, we then calculated the LD between English phonological word forms and Japanese phonological word forms based on phonetic notation. Finally, to gain a measure of neighbourhood size, we used the PLD20 algorithm [3]. Using a picture naming task, with an orthographic form prime preceding the picture target and picture names defined by phonological neighbourhood densities within and across languages, now allows us to investigate phonological lexical tuning in bilinguals in the future. This, in turn, might provide us with information about how the development and integration of second language lexical entries influences and possibly aids L2 performance in bilinguals.

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Effect of bilingualism on lexical stress pattern discrimination in French-learning infants

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Monolingual infants start learning the prosodic properties of their native language around 6 to 9 months of age, as marked by the development of preferences for predominant prosodic patterns [1,2] and decreases in sensitivity to non-native prosodic properties [3]. Using the head turn preference procedure (HPP), the present study evaluates how bilingual acquisition might affect speech perception, by exploring stress pattern discrimination in French-learning 10-month-olds raised in bilingual as opposed to monolingual environments.

In Experiment 1, sixteen monolingual French 10-month-old infants were familiarized for 1 minute and 16 other infants for 2 minutes with different exemplars of the same CVCV sequence (*gaba*) that were pronounced either with a trochaic or an iambic pattern (pattern counterbalanced across infants), and then tested with trials of the same stress pattern versus the opposite pattern. Only the infants who were familiarized during 2 minutes, discriminated two stress patterns ($p = .0001$) and showed a novelty response, while the infants familiarized during 1 minute condition did not ($p=.62$).

Then, Experiment 2 evaluated 10-month-old French/different language (all languages using stress at the lexical level) bilinguals with the short 1-minute familiarization. Two different subgroups of bilinguals were tested depending of the percentage of exposure to the second language. Sixteen bilinguals were exposed to the second language 70-80% of the time and 16 other bilinguals were exposed 30-60% of the time. The discrimination performance was significantly better ($p = .0001$) for the subgroup of bilinguals who were more exposed to the language other than French than for the other more balanced subgroup ($p = .075$). In comparison with monolingual group in short familiarization, only those bilinguals with dominant other language was significantly different from monolinguals ($p = .001$).

The above pattern of results establishes that monolingual French-learning infants need more time than bilingual infants in order to extract a stable representation of stress pattern, which is compatible with the proposal that sensitivity to prosodic contrasts is maintained or enhanced in a bilingual population compared to a monolingual population in which these contrasts are non-native, provided that this dimension is used in one of the two languages in acquisition. Moreover, the quantity of exposure to each language can determine which language is dominant, and that may make some bilinguals more sensitive to certain language properties than to others.

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Event-related potential correlates of language change detection in toddlers

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Children raised in a bilingual environment are faced with the daunting task of learning to extract meaning from language input that can differ between caregivers but, depending on the social context, also within caregivers. Here, we investigated monolingual and bilingual toddlers' brain responses to an unexpected language change. We presented 2–3 year old children with picture-word pairs and occasionally changed the language of the spoken word while recording event-related potentials (ERPs). In line with previous results obtained in adults, bilingual children differentiated between the languages of input faster than their monolingual peers, i.e., within 200 ms of spoken word onset, a time range previously associated with lexical access. However, whilst adult bilinguals displayed a late stimulus re-evaluation ERP response to a language change, no such modulation was found in bilingual toddlers. These results suggest that although bilingual individuals are sensitive to phonemic language cues already from an early age, language awareness and language monitoring mechanisms probably develop later in life.

The nature of second language acquisition abilities

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We present the results of a study of twins that examines the relative roles of genes and aspects of the environment in influencing individual differences in second language (SL) acquisition among high-school students with the purpose of assessing to what degree the ease with which particular people learn a SL is an innate or acquired ability and whether learning a SL appears to depend on general cognitive mechanisms or more specialized linguistic processing.

We collected data from 251 Australian twin pairs, their parents and foreign language teachers regarding their proficiency in a SL, as well as other relevant information related to their language history, personality, attitudes, etc. We first assessed whether individual differences in achievement in the SL are due to heredity using the classical twin design, which compares the correlations of monozygotic and dizygotic twin pairs to partition the variance into (1) genetic effects, (2) shared environment effects, those experienced by both twins in the pair such as school effects or parental influence, and (3) unique environment effects, those experienced by one twin but not the other, including measurement error. The measures of SL achievement included ratings from teachers, class rankings by teachers, and the twins' self-ratings of proficiency. We found the effect of genes to be substantial in explaining variability in SL achievement (accounting for up to 72% of the variance) in contrast with a much lower contribution of the shared environment (accounting for between 7 and 20% of the variance depending on the measure used). We then looked at the possible effects of a range of specific factors usually thought to affect the acquisition of a SL at school. Contrary to expectations, we found that students' willingness to practice even at the risk of making errors did not have an effect on their SL proficiency, and neither did the age at which the SL started to be acquired or having been raised bilingual (in a different language). On the other hand, parents' attitudes towards the importance of acquiring a SL seemed to influence the children's attitudes which, in turn, affected the students' perception of their own capabilities, but not the more objective measure of achievement provided by teachers. Finally, we found that another measure of academic achievement, namely level of proficiency in reading and writing in the first language, did correlate with achievement in the SL.

Jointly, these results seem to indicate that SL acquisition is, like other aspects of school achievement that have been studied, influenced to a fair degree by genetic endowment and relatively less so by family environment. This suggests that SL acquisition may be more reliant on general cognitive processes involved in academic learning than on some form of specialized linguistic capacity.

Transfer types in the acquisition of French noun phrase structure by Spanish-Speaking children

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Children attending French schools in Montreal often use another language at home, and are exposed to French only when entering kindergarten. These children are at different stages of their L2 acquisition. They provide a fascinating look at interference and transfer between their two languages. However, they can also be at risk of presenting a language delay and are often misdiagnosed as having a language disorder. Understanding linguistic processes underlying typical L2 acquisition allows us to identify normal and abnormal language acquisition behavior [1]. We investigate the acquisition of noun phrases and intranominal agreement Spanish-French L2 learners. Both Spanish and French have gender agreement, but their syntactic and morphological structures differ. In Spanish, morphological marking of agreement is transparent (1a), while in French it is opaque (having various final consonants for feminine adjectives) (1b). Moreover, Spanish usually only allows for postnominal adjectives while French has adjectives are either pre- or postnominal. According to Genesee et al. [1], Spanish children learning French should transfer their L1 grammar when producing L2 structures during their early interlanguage phases of language acquisition.

(1) a. *La casa chiquita blanca* [lakasatʃikit**a**blaŋk**a**]
the.f house small.f white.f
b. *La petite maison blanche* [lapətit**t**mɛjzɔ̃blɑ̃**ʃ**]
the.f small.f house white.f
'the small white house'

Ten children with Spanish as their L1, aged 4 to 6 years, and exposed to French for one year participated in elicitation tasks for French noun phrases with masculine or feminine, variable or invariable, color and size adjectives (see for ex., 1b). Monolingual French children matched on age, sex, and parents' educational level served as controls. L2 children perform below L1 children on all tasks except simple color naming. Repeated measures ANOVAs on scores for adjectives with variability (variable and invariable) and gender (masculine and feminine) as within factors, and participant group as the between factor revealed that variable feminine adjectives were more difficult to produce for the L2 (31,67%) as compared to the L1 group (83,33%), while other French adjectives showed similar response patterns in both groups. Transfer effects from Spanish to French were found for syntactic but not morphosyntactic structures: L2 children produced prenominal adjectives in ungrammatical postnominal positions. Few loanword intrusions occurred. Moreover, the L2 group was heterogeneous, as some attained levels similar to L1 children, while others showed floor effects. Our results show that L2 children have constraints on their transfer of L1 syntax and morphosyntax in their L2, and have high levels of attainment of lexical knowledge while lagging in idiosyncratic knowledge linked to lexical items (variable adjectives and restrictions on adjective placement).

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Articles in real-time language comprehension

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It is well known that second language learners (L2ers) from articleless L1 backgrounds show persistent variability in L2 article production. Much less is known whether they process the information signalled by L2 articles during real-time language comprehension. The experiment reported here addresses this question by employing the visual world eye-tracking paradigm to explore how articles affect the timing of reference resolution in Mandarin learners of English.

In this paradigm, a participant is presented with a picture while hearing a sentence related to the objects presented in the picture. In the critical trials, participants heard sentences of the frame "The ACTOR will put the THEME inside the/a GOAL". There were two versions of each sentence, varying the definiteness status of the goal referent, and two versions of the visual scene: in one, the two goal objects (identical containers) were both open; in the other, one was open, and the other closed. Pragmatic information (the number of open goal referents) and the linguistic context (indefinite vs. definite article) were crossed, yielding four conditions [1]:

	Linguistic stimuli:	Picture stimuli:
Matched	*The pirate will put the cube inside **the** can.*	one open and one closed can
	*The pirate will put the cube inside **a** can.*	two open cans
Mismatched	*The pirate will put the cube inside **the** can.*	two open cans
	*The pirate will put the cube inside **a** can.*	one open and one closed can

If L2ers are sensitive to the uniqueness information signalled by articles (*the* signals the uniqueness of a referent; *a* implicates non-uniqueness, cf. [2]), we would expect them to behave like native speakers, i.e. reference resolution should be slowed down in mismatched contexts [1]. For example, when there is only one pragmatically compatible goal in the visual scene (e.g. only one of the two cans is open) and the sentence contains "**the** can", participants are expected to fixate the appropriate goal sooner relative to the condition with "**a** can", which could imply non-uniqueness (i.e. that there are other cans in which the cube could fit). But if L2ers rely exclusively on the pragmatics of the context to determine the goal, they should always be faster when there is only one goal pragmatically compatible with the theme object (i.e. the single open can contexts), irrespective of the definiteness value of the noun phrase.

The results show that reference resolution was indeed slowed down in language-picture mismatched contexts for intermediate L1 Mandarin / L2 English learners. This suggests that they successfully processed the information signalled by English articles in real time. While previous research has demonstrated that L2ers from L1s without articles often show variability in L2 article production, even at very advanced stages, these results suggest that they may nevertheless be sensitive to the information signalled by articles in real time comprehension, even at earlier developmental stages. The presentation will consider why there seems to be an asymmetry between L2 article production and L2 article comprehension.

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Grammatical gender processing in L2 Spanish: Eye tracking evidence from L1 speakers of Italian and English

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One important cross-linguistic difference between Spanish and English is the presence of grammatical gender in Spanish. Whereas Spanish obligatorily encodes grammatical gender in prenominal modifiers [*el zapato* "the shoe" (masculine), *la camisa* "the shirt" (feminine)], English lacks grammatical gender. In a recent study, Lew-Williams & Fernald (2007) showed that native Spanish speakers use grammatical gender information encoded in Spanish articles to facilitate the processing of upcoming nouns. Using the visual world paradigm (Tanenhaus et al., 1995), they presented Spanish-speaking participants with two-picture visual scenes in which candidate items either matched in gender, e.g. *pelota* (fem) "ball" v. *galleta* (fem) "cookie," or differed in gender, e.g. *pelota* (fem) v. *carro* (masc) "car." Target items were embedded in the carrier phrase, *Encuentra el/la* __"Find the __." On different gender trials, both groups were able to orient their eyes towards target items more quickly than on same gender trials, eliciting an **anticipatory effect**.

Building on this finding, the present study reports the results of two experiments investigating whether grammatical gender facilitates noun recognition during second language (L2) processing. Sixteen monolingual Spanish participants (control group) and 18 English-Spanish participants (evenly divided into high and low proficiency) saw two-picture visual scenes in which items matched in gender (la pelota/the ball$_{fem}$-la marioneta/the puppet$_{fem}$) or did not match (la pelota/the ball$_{fem}$- el avión/the airplane$_{masc}$). Participants eye-movements were recorded while they listened to 28 sentences in which the masculine and feminine target items were preceded by an article that agreed in gender with the two pictures [*El niño quiere **la pelota** que está en la juguetería*/The boy wants the ball that is in the toy store—while viewing the pictures of a ball and a puppet] or agreed only with one of the pictures [*El niño quiere **la pelota** que está en la juguetería*—while viewing a ball and an airplane]. An additional group of 15 Italian learners of Spanish (who were moderately proficient in Spanish) was tested to examine whether the presence of gender in the L1 modulates the degree to which gender is used during L2 processing. Data were analyzed by comparing the proportion of looks to the objects in each condition. Monolingual Spanish speakers oriented their eye movements sooner to the referent on different-gender trials than on same-gender trials, replicating results reported in past literature. Italian-Spanish bilinguals exhibited a gender anticipatory effect, but only for the feminine condition. For the masculine condition, participants waited to hear the noun before identifying the referent. Like the Spanish monolinguals, the highly proficient English-Spanish speakers showed evidence of using gender information during on-line processing, whereas the low-proficiency did not. Taken together, the results suggest that the usefulness of morpho-syntactic information during speech processing is modulated by proficiency in the L2 [1] in addition to similarities between the L1 and L2 [2].

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Do bilinguals and multilinguals have larger social networks than monolinguals?

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There appear to be some cognitive advantages to bilingualism and multilingualism, particularly in areas such as metalinguistic awareness [1] and inhibitory control [2]. In this paper, I investigate whether there may be social consequences to the increased cognitive demands of processing more than one language.

The mean size of social network for an individual has been put forward as approximately 150 individuals, based on the volume of the human neocortex and relating it to the ratio of other primate neocortical volumes to their social community sizes [3]. Dunbar hypothesises that a mean size of 150 individuals may be an emergent property of the cognitive processing required by smaller groups of support (5 individuals) and sympathy (15 individuals) [4], i.e., it is individuals' smaller social networks that require time and effort to maintain emotionally close relationships. Dunbar and his colleagues have found that network size is affected by individual differences such as gender, personality and age [5,6]. However, the social network data Dunbar has analysed do not appear to distinguish between differences in language background, and it is possible that this is another variable influencing social network size. Bilinguals and multilinguals need to maintain their social networks across language boundaries, and negotiate the relationships between members in their networks, which requires cognitive effort.

The goal of this study is to discover whether there is a relationship between individuals' language background and the size and quality of their wider social network, in order to find out whether the cognitive demands of processing more than one language may have social consequences. Participants divided into monolingual, bilingual and multilingual groups give self assessments of their language background and their social network, and complete an advanced test of theory of mind as a cognitive assessment. The findings will show 1) whether monolinguals, bilinguals and multilinguals differ with regard to the size of their social networks; 2) whether they differ with regard to theory of mind; and 3) whether their theory of mind relates to the size of their social networks.

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Overcoming phonological deafness in L2 conversations by perceiving the facial movements of the speaker

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One of the major challenges when we engage in a conversation in a foreign language (L2) is to overcome *phonological deafness*. This concept refers to the difficulty in distinguishing phonological contrasts that do not exist in our native language (L1). We tend to assimilate L2 sounds to the L1 phonemes. For example, French speakers tend to confuse the Spanish inter-dental fricative phoneme /θ/ with the labio-dental fricative /f/ that exists both in French and Spanish. At the lexical level, they have difficulties in distinguishing the Spanish words *ce* from *fe*. The impact of phonological deafness is even stronger when the communication situation takes place in an auditory only situation like when having the L2 conversation on the phone. Although daily experience confirms it, there are no studies that addressed this issue. Research on audiovisual speech perception only showed that decoding the speaker's oro-facial movements enhances speech intelligibility in noisy environments.

We conducted a behavioural variant of a Mismatch Negativity paradigm (MMN) with Audio only (A) and Audiovisual (AV) presentations. The stimuli were in Spanish and the participants were French adults. Each trial began with the presentation of several tokens of a base (e.g. /fe/). Then we presented the targets (e.g. /θe/) mixed with distracters (e.g. /se/ differs in the consonant and /fo/ differs in the vowel). The participants had to decide whether the stimulus differed or not from the base. The results indicated that in the Audio only condition the participants had difficulties in distinguishing /θe/ from /fe/. They exhibited phonological deafness. Conversely, in the Audiovisual condition they distinguished /θe/ from /fe/ correctly in more than 90% of the trials. Furthermore, when the participants distinguished /θe/ from /fe/ response times were much faster in AV than A.

This data reveals that the participants exploited the visual information on the speaker's lip/tongue movements to distinguish the sounds that they confused in the auditory only situation. In other words, the acoustic information of the /θ/ was not enough auditory information for the participants to distinguish it from other sounds and assimilated it to /f/ because this phoneme exists in their native language. The visual cues provided by the articulatory movements of the speaker prevented this assimilation. These results show that the visual information provided by the speaker's face not only enhances speech comprehension in adverse communication situations –as in noisy environments– but also prevents the assimilation of L2 sounds to L1 phonemes when having to understand a non-native language.

Grapheme coding in L2 learners

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Language nonselectivity in bilingual lexical access has received great support from bilingual word recognition literature and has been accounted for models of bilingual word recognition such as the bilingual interactive activation + model [1]. Though bilingual studies have focused on the issue of an integrated bilingual lexicon, this model also suggests the existence of an orthographic sublexical level, composed of letter and grapheme units. Rey, Ziegler & Jacobs, 2000 [2] evidenced that graphemes are indeed processed as a unit during adult monolingual word recognition: the rationale is that detecting the presence of a pre specified letter when embedded in a complex grapheme (i.e., one grapheme composed of two or more letters) should take longer that when embedded in a simple grapheme (i.e., one grapheme composed of one letter) if graphemes are processed as a unit. When learning a second language (L2) such as English, one is confronted to new graphemes, some of which are language-specific such as « oa » or « th » for a native French speaker learning English. However, some complex graphemes may also exist in the first language (L1) and can therefore be considered as language-shared, such as « ou » or « ch ». Surprisingly, sublexical orthographic coding issues have remained largely unaddressed in bilingual research. Yet, this topic is particularly relevant when studying low proficient bilinguals whose L2 word recognition mechanisms are less fine-tuned.

The present study examined the question of grapheme coding in adult French speakers considered as low-proficient L2 speakers as well as children learners of English at Secondary Grade 8 in order to investigate the sublexical coding mechanisms at different stages of L2 proficiency.

Two groups of French – English speakers varying of L2 exposure (Grade 8 children and adult speakers) had to perform a letter detection task in English (L2). Three conditions of target-present items were proposed: 1) letter embedded in a simple grapheme (i.e., *black*); 2) letter embedded in a complex language-specific grapheme (i.e., *beach*) and 3) in a complex language-shared grapheme (i.e., *brain*). Target words were all monosyllabic words, matched on letter length and word frequency across the three conditions.

Grade 8 children and adult participants were shown to detect letters when embedded in a complex language-specific grapheme more slowly than when presented as a single grapheme. While adults performed similarly for both complex graphemes conditions (language-specific and language-shared), this was not the case for Grade 8 children whose latencies for complex language-shared graphemes were in-between conditions 1 and 2.

This is the first piece of support of the view for a grapheme coding mechanism in L2 word recognition, even in young L2 learners. This sublexical coding seems to vary according to the language -specificity of the orthographic pattern, and L2 exposure. More empirical data and theoretical assumptions should further help understand sublexical coding mechanisms in bilinguals and L2 learners.

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Counterfactual thinking in French as a second language by a group of Italian bilinguals: when the use of conditional tense fills a representational gap

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Counterfactual thinking is a universal cognitive process. From a semantic point of view the protasis (if P) introduces the proposition as not real. However, counterfactual marking in the protasis are different in French and Italian: while French requires the indicative mood, Italian requires the subjunctive mood, although the indicative mood may be used in some vernacular varieties. Besides, Italian offers an additional option: the indicative marks the "possible truth" of the proposition and the subjunctive mood marks its "possible falsity" [1]. These particularities represent an interesting point of departure to investigate Whorf's linguistic relativity theory as reformulated by Slobin, i.e. languages differ in the way they conceptualize shared universal experiences in discourse [2].

The paper is devoted to the analysis of oral productions of counterfactual thinking in French as a second language by a group of 5 Italian bilinguals (3 women and 2 men aged between 20 to 30 years-old; all of them have learnt French as a second language for at least 5 years and were living in France at the time of data collection). The main hypothesis of the study is that errors on verbal morphology in counterfactual clauses are due to a representational gap linked to the expression of the French counterfactual modality. Our methodology is based on an effect-cause order [3] instead of chronological order. Based on this principle we have carried out two types of tests: an experimental task and a test replicated from a psychological test [4] in order to obtain conceptualizations of causal judgments in mental simulation experiments. The stimuli were a sequence of three pictures and a text. In both cases, guided interviews were developed both in French and Italian.

The French corpus comprises more than 4 hours of recording. The analysis of the data has yielded "hypothetic" utterances, including 60 counterfactual utterances. 21% of protasis clauses and 3% of apodosis clauses carry incorrect inflection containing conditional verb forms and future perfect verb forms respectively. The use of future perfect in apodosis clauses can be explained by the formal similarity to conditional. However the residual use of conditional verb forms in the protasis in the Italian data (1%) invalidates the contrastive hypothesis of L1 influence as an explicating factor for the ungrammatical verb forms. Moreover, the analysis of the marker *même si* shows a perfect mastery of the French verbal system both in hypothetical and counterfactual protasis while the use of its equivalent in Italian data (*anche se*) is enlarged to subjunctive mood. This provides evidence that the overuse of the conditional tense in French as L2 fills a representational gap in which irreality and modality are closely related.

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Full cued Full learning of a second language grammatical gender system: evidence from ERP's

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A general finding in second language (L2) research is that grammatical gender acquisition is strongly influenced by the presence of a grammatical gender system in the bilingual's first language (L1). However, we still know relatively little about the extent to which linguistic properties of the L2 may influence learning rate of gender agreement in L2. The aim of the present study was to examine the impact of L2 properties, notably the presence vs. absence of overt phonological cues to inflectional morphemes, on the acquistion of grammatical gender agreement in L2 French L2 by adult learners. In addition, we examined the role of the overlap of grammatical rules in the L1 and L2 by comparing performance for participants whose L1had either a similar (Spanish) or divergent (German) grammatical gender system with French. Event-related potentials (ERPs) were recorded while native French controls, Spanish-French learners (Experiment 1) and German-French learners (Experiment 2) read and made acceptability judgments about French sentences in which noun-adjective gender agreement was either correct (e.g. *la fleur*$_{fem}$ *verte*$_{fem}$ 'the green flower') or incorrect (e.g. *la fleur*$_{fem}$ *vert*$_{masc}$* 'the green flower'). Phonological realization was manipulated via the use of variable and invariable adjectives in which overt phonetic cues to gender agreement were respectively present (e.g. *vert/verte* [vɛr, vɛrt]) or absent (e.g. *bleu/bleue* [blø]). The results of both experiments showed clear effects of the oral realization of gender agreement. In Experiment 1, native French speakers showed a P600 effect in response to gender concord errors, which was significantly larger for violations involving variable adjectives than for those involving invariable adjectives. Spanish-French learners showed a P600 effect only in response to gender agreement errors involving variable adjectives; no robust effects were observed for violations involving invariable adjectives. In Experiment 2, both German-French learners and native French control participants, showed a larger P600 effect for violations involving variable than invariable adjectives. Overall, these results provide strong evidence that the overt phonological realization of gender agreement enhances processing in native speakers and in L2 learners alike, regardless of the differences across grammatical gender systems in the L1 and L2. These findings indicate that L2 learners are highly sensitive to linguistic properties of the target language which determine the way L2 grammatical properties are integrated into the L2 learners' processing system and subsequently influence the rate of grammatical learning in L2.

Proficiency effects on the organization of the bilingual lexicon

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Many experiments using the masked translation priming paradigm have provided evidence supporting the view that translation equivalents share a semantic representation in the bilingual mental lexicon. Such studies have made important contributions to our understanding of bilingual language processing and of neural organization in general.

Varying results have been obtained, however, depending on factors such as the type of bilinguals tested and the directionality of the prime-target relationship. For example, several studies using lexical decision tasks have found asymmetry in cross-language priming effects; while consistent and significant effects have generally been found for L1-to-L2 priming conditions, effects have been smaller in magnitude for L2-to-L1 priming conditions, and often not even statistically significant [1]. Other studies have not found such directional asymmetry. For example, low proficiency Dutch-French bilinguals showed an L1-to-L2 priming effect of 48ms and an L2-to-L1 effect of 26ms [2]; highly proficient L2-dominant Spanish-English bilinguals showed an L1-to-L2 priming effect of 33ms and an L2-to-L1 effect of 24ms [3]; and highly proficient simultaneous Basque-Spanish bilinguals showed an effect of 20ms when the prime was in Basque and an effect of 16ms when the prime was in Spanish (both L1s) [1]. While prime-target directionality was not found to be a significant factor in each of these studies, the difference in effect magnitude between these two experimental conditions seems to decrease with increasing L2 proficiency.

The goal of our current study is to further investigate the relationship between L2 proficiency and the L2-to-L1 translation priming effect. By specifically examining L2 proficiency, our study also addresses another issue that currently remains under debate: how L2 proficiency and L2 Age of Acquisition (AoA) interact, and what effect each has on bilingual processing. This study builds on the current research in our lab [4], where French-to-English translation priming has been found to be significant for simultaneous bilinguals, not significant for English monolinguals, and where a graded though non-significant translation priming effect has been found for L2 learners of French. Further, in contrast to studies which have examined proficiency and AoA as categorical variables, this study looks at these measures on a continuum which, as we will argue, better accounts for the data and offers new insights into the process of second language acquisition. Results will be discussed with respect to models of the bilingual lexicon which take into account differing levels of bilingualism, such as the Revised Hierarchical Model and the BIA+ model.

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The cognate facilitation effect is modulated by the word frequency of both readings: behavioral and electrophysiological evidence

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When a word is similar in orthography and meaning between the two languages of a bilingual, i.e., when it is a cognate, its recognition is generally facilitated compared to matched control words [1]. There have been contrasting views in the literature on how to explain this facilitation effect for completely identical cognates, such as FILM for Dutch and English [2][3]. Do identical cognates have one or two orthographic representations in the bilingual brain?

To answer this question, we selected four groups of cognates with either a low or high frequency in the first and/or second language of French-English bilinguals and matched them with English control words. The bilinguals performed an English lexical decision task while their RTs and ERPs were recorded.

The behavioral data showed facilitatory effects of cognate status and English L2 frequency. Further analysis of the identical cognates revealed significant main effects of both English and French frequency. Cognate facilitation was larger for cognates with a low English frequency compared to cognates with a high English frequency.

The electrophysiological data showed a decreased negativity for cognates compared to control words in the N400 time-window. Those effects were more prominent for low-frequency English cognates than for high-frequency English cognates. Interestingly, for cognates with a low English frequency and a high French frequency, an effect was found in an early time-window (100-150 ms after stimulus onset).

These results shed light on the representation of identical cognates in the bilingual brain and question the representational locus of word frequency effects.

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Cognate word recognition: the role of orthographic and phonological similarity in two different tasks

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How bilinguals recognize cognate words (i.e., words that are equivalent in two languages and share most of their orthography and phonology) is an issue that has been extensively explored in the literature. Different studies have shown that cognate words are processed faster and more efficiently than non-cognates [1]. Different proposals have been advanced to explain this facilitation effect. The lexical-morphological hypothesis [2], for example, explains this effect due to the shared morphological representation of cognates in bilingual memory. On the other hand, the symbolic, localist, connectionist framework [3] emphasizes the formal similarity between cognate words in the two languages.

The present study aims at exploring the impact of the orthographic and phonological similarity of European Portuguese-English cognate words in their recognition by using a masked priming paradigm. Besides, we were interested in evaluating whether these effects were task dependent. One-hundred and ninety-two English target words (96 cognates *vs.* 96 non-cognates), matched in frequency, length, bigram frequency and grammatical class were selected. Cognate words were divided into four experimental conditions according to their orthographic (O) and phonological (P) overlap: (i) O+P+ (high overlap in both O and P); (ii) O+P- (high overlap in O and low in P); (iii) O-P+ (low overlap in O and high in P); and (iv) O-F- (low overlap in both O and P). The orthographic similarity was calculated using Van Orders' (1987) algorithm, and the phonological similarity was determined according to three parameters: stressed vowel, quality of the stressed vowel and phonetic properties of the first phone of each word. The target words were preceded either by the prime European Portuguese equivalent translation (e.g., *bomba* – BOMB) or by a non-related prime (e.g., *vasto* [vast] – BOMB).

Twenty-eight proficient European Portuguese-English bilinguals (average age: 23 years; SD = 5.84) participated in this study. All of them have been acquired the second language at the age of 8 years (SD= 2.05), and they had at least 5 years of English-learning experience (M=10.11, SD=3.8). The mean of proficiency ratings was 5.8, on a seven-point scale, seven being the highest proficiency level. Participants performed firstly a silent reading task and three months later a lexical decision task, both combined with a masked priming paradigm (SOA 47ms). The results showed that the processing of cognate words was modulated by both the phonological and orthographic overlap, as well as by the type of task used. The implications of these results to the aforementioned proposals will be discussed.

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Interlingual competition in a spoken sentence context: Evidence from the visual world paradigm

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In this study, the visual world paradigm was used to investigate interlingual lexical competition when listening to low-constraining sentences. With this aim, eye movements were recorded while Dutch-English bilinguals listened to low-constraining sentences containing the target in the nonnative language (L2; Experiment 1), or in the native language (L1; Experiment 2). When listening in L2, participants fixated more on competitor pictures with phonologically related onsets in the non-target language than on phonologically unrelated distracter pictures. Even when listening in L1, this effect was also observed when the onset of the target picture (in L1) and the competitor picture (in L2) was phonologically very similar. These findings provide evidence for interlingual competition in a spoken sentence context in L2, but also in L1.

How experience reshapes perception: the case of non-native vowel contrasts in late bilinguals

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The experiments reported here examined whether French native speakers with extensive formal learning differ from French-English late bilinguals, who have been immersed in their L2, as concerns the capacity to perceive non-native vowel contrasts in a late-learned language. The perception of /E/-/I/ and /i/-/I/ contrasts in English, absent from the French vowel repertoire, was examined in these two groups and in a control group of native English speakers. Selection of contrasts was based on previous studies on the auditory ERP response to these American English vowel contrasts [1,2]. In these studies, under conditions of isolated vowel presentation, French native speakers and French-English late bilinguals could perceive the /i/-/I/ contrast, whereas only French-English bilinguals perceived the /E/-/I/ contrast, in like fashion to native speakers. We excepted differential performance for these two contrasts as a function of L2 proficiency.

In the present study, participants performed two tasks: an ABX and a lexical decision task with a long-lag repetition priming paradigm (LDT). Both experiments required participants to process minimal pairs for these contrasts (/bEt/ and /bIt/ or /liv/ and /lIv/). The comparison of these two tasks enabled us to examine the levels of representation implicated in the processing of these contrasts. The ABX task focuses on direct discrimination and can be performed on the basis of acoustic and/or phonemic differences, while the LDT depends upon lexical representation and subsequent distinction between lexical items.

Performance on the ABX task was at ceiling level for all three groups of participants and for both contrasts. These results are in partial contradiction with previous ERP work [1,2], especially concerning the /E/-/I/ contrast that is known to be difficult for French native speakers. They are also in contradiction with behavioral results [3], showing “deafness” to non-native vowel contrasts. We argue that the ABX paradigm is not robust enough: it allows for alternative strategies involving an acoustic level of representation. As for the lexical decision task, preliminary results suggest that the phonological categories created via the subject’s’ experience with an L2 are not stable enough to be processed within words. Only the American-English subjects showed a difference between minimal pairs (/bEt/-/bIt/) and repeated items (/bEt/-/bEt/). The results from the lexical decision task differ from our previous ERP results with isolated vowels. However, while our ERP results showed that late learners establish new L2 vowel categories; this discrimination was not as stable as that of native English speakers. Therefore, it is not surprising that late learners had not established clearly distinct lexical representations for these minimal pairs. We conclude that even if acoustic and phonological distinctions can be learned given greater competence in an L2, late bilinguals are not able to maintain these distinctions lexically and therefore show a lack of plasticity at a higher level of representation.

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The role of proficiency in L2 processing of grammatical gender: Evidence from ERPs

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The present study examined the real-time processing of grammatical gender by Dutch natives and late advanced Polish [+ gender] learners of Dutch. In Dutch, all nouns belong to either one of two categories: common gender (de-words) and neuter gender (het-words) and gender within a noun phrase is either marked on the article (definite NPs) or the adjective (indefinite NPs). For (late) second language learners, grammatical gender appears to be one of the most difficult features to acquire. The present experiment compared event-related potentials in response to spoken Dutch sentences that were either correct or that contained a grammatical violation. These ungrammatical sentences either consisted of violations of finiteness (example sentence 1) or incorrect gender-marking on the article or adjective preceding the noun (example sentence 2).

1. Ze heeft alleen haar beste vriendin uitgenodigd/***uitnodigen** voor haar verjaardag.
   *She has only invited/****invite** her best friend for her birthday.*

2. De bakker maakt het/***de brood** volgens speciaal recept.
   The baker makes the$_{NEU}$/***the$_{COM}$ bread** according to a special recipe.

In the experiment, subjects were asked to judge each sentence on acceptability. In addition, Polish learners were tested on general proficiency (e.g. spontaneous speech, cloze-test) as well as measures of their explicit knowledge of the Dutch gender system. This gender assignment task, conducted after the experiment, consisted of a list of nouns that contained each target item of the experiment three times. Only ERP epochs in response to nouns of which the subjects knew the gender were analyzed. In line with previous findings, native Dutch speakers reveal a clear P600 for both the finiteness as well as the gender violations, which has been assumed to indicate a repair or re-analysis process in response to these mismatches. In both the high and low proficiency L2 learners, finiteness violations elicited a P600 that started significantly later as compared to the P600 found in the native speakers. A P600 in response to the gender mismatch, however, was only reliably present in the high proficiency L2 learners. Low proficiency learners show a delayed and reduced N400 in response to gender violations. These results show that advanced L2 learners can process general syntactic features similarly to natives. Grammatical gender, however, remains one of the major stumbling blocks in learning a second language after puberty. In earlier stages of L2 learning, grammatical gender violations are processed in a qualitatively different manner resulting in an N400 effect. If proficient enough, however, late advanced learners can process grammatical gender in a native-like fashion as reflected by a delayed and reduced, but reliable P600 effect.

The expression of motion events in bilingual first language acquisition

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The present study examines the implications of Talmy's proposed motion event typology for the simultaneous acquisition of English *(satellite-framed)* and French *(verb-framed)* in the light of current models of bilingual language use and acquisition. The paper focuses on the impact of language-specific lexicalisation patterns on the directionality and nature of crosslinguistic interactions in bilingual development.

The study compares (1) simultaneous English-French bilingual children in four age groups (four, six, eight, and ten years) and (2) age-matched monolingual English vs. French children acting as controls (12 children per age/learner group). All children described animated cartoons showing both caused and voluntary motion events. Half of the bilingual children provided descriptions in English, the other half did so in French.

Results indicated a unidirectional and task-dependent pattern of crosslinguistic influence. In the caused motion task, which involved multiple information components, bilinguals' English descriptions closely paralleled monolingual English usage, whereas responses in French showed both quantitative and qualitative differences from those of monolingual French children. Accordingly, French productions manifested a preference for satellite-framing lexicalisation patterns that were not agrammatical in French but more typical of English and/or rather idiosyncratic, (e.g. (1) and (2)).

(1) *Il roule la botte de paille à travers le chemin.* (10 years)
'He rolls the hay bale *across the path.'
(2) *Il pousse une valise pour descendre la colline.* (10 years)
'He pushes a suitcase in order to descend the hill.'

It is argued that transferring the very compact and transparent English pattern provides children with a systematic and structurally low-cost means of producing information-dense descriptions in situations that require them to express multiple semantic components. Accordingly, the voluntary motion task, which involved fewer information components, did not give rise to such crosslinguistic interactions. In line with the prediction of task-dependency, analyses show that in this context, descriptions produced by bilinguals in either language did not diverge from response patterns of English and French monolinguals.

The discussion highlights the implications of typological constraints for future hypotheses concerning the relation between language and cognition in models of bilingual and monolingual language use and acquisition.

How do Basque-Spanish bilinguals handle gender in code-switching?

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Studies on Spanish-Basque code-switching are still scarce [1,2]. Mixed nominal constructions are common in naturalistic conversations among Basque-Spanish bilinguals [1]. While Basque does not mark gender, Spanish does, and nouns and their accompanying articles and adjectives must match in gender.

Two different patterns of mixed nominal constructions were observed in the data. Example (a) below shows an attested outcome of inserting a Basque NP in a Spanish clause. The bracketed DP (*el txano*) includes morphemes belonging to two languages. The determiner (D) *el* is plural and belongs to the Matrix Language, Spanish, which provides the morphosyntactic frame. But the NP (*txano*) comes from the Embedded Language, Basque. Its equivalent Spanish translation is masculine, so as expected we find a masculine D.

However, another very common pattern arises in the naturalistic data, as shown in (b). In this example the D *las* is plural and belongs to the Matrix Language, Spanish, and the NP (*marrazki*) comes from the Embedded Language, Basque. Its equivalent Spanish translation is masculine, so as in (a) we would expect a masculine D, but we get a feminine D. In Deuchar et al 2010 we posited that the Basque determiner (*-a*) suffixed to the noun —as in (a)— is reinterpreted, as a feminine marking gender morpheme in code-switching.

In this study, we collected experimental data to see whether bilingualism type and extra-linguistic factors affect gender assignment in the mixed nominal constructions. Thirty Basque-Spanish bilingual undergraduates who learned Basque at home and attended Basque-medium and/or bilingual primary/secondary school and thirty Basque-Spanish bilingual undergraduates who spoke Spanish at home and learned Basque at school were recruited. We investigated the production (director-matcher task, 3) and acceptability (judgment task) of code-switched nominal constructions. These tasks allowed us to compare off-line production with assessments.

Our results will help to show how far constructions like (a) and (b) are produced by all types of speakers, and whether the language learned first or most widely used in the community makes a difference in the preferred pattern.

(a) ¿Alguien ha visto [el *txano*]? "Has anyone seen the *hat?*"
Someone has seen Det *hat*

(b) Jon hizo [las *marrazki**a***s] por la tarde "John made the *drawings* during the afternoon"
John did Det.Fem.Pl *dibujo.**Det***.Pl in the afternoon

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Cognitive bilingualism and social bilingualism, two dimensions of a same fact: The case of French - Creole bilingual children

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This study deals with the link between the performances of bilinguals on cognitive tasks and their linguistic practices as bilingual speakers. On one side, studies using cognitive paradigms report an advantage of bilinguals over monolinguals on tasks. On the other hand, sociolinguistic researches indicate that even if bilinguals have two languages, the usage of each language depends on the status of speakers and the situation of interaction. So these two dimensions of bilingualism must have links between them. However, studies are limited and concern more the bilingualism with two main languages as English and Spanish for instance. In the French Over Sea department of Martinique, two languages are used: French and Creole. We evaluate 142 pupils of primary school age (in the 3rd Grad) and 133 teenage speakers (in the 6th Grad) on a range of cognitive tasks and with a questionnaire about self practices. Three tasks are developed in French, in Creole and in both languages: a categorization paradigm based on lexical priming, a words' recall and finally an inhibition task such as Stroop. The questionnaire consists of 35 items describing the linguistic usages of speakers in different contexts (at home, at school, in open space) and with different partners (parents, family, teachers, adults, peers, brothers). The performances and the reaction times of the cognitive tasks are recorded. They are compared with the social linguistic level of speakers: monolingual, occasional bilingual and intensive bilingual.
Results vary according to task and age. No social linguistic level reveals a clear relation with the cognitive tasks. Instead, one group or another shows hints of better performance on a given task. Even if the cognitive tasks are not sufficiently discriminating, our assumption - links between cognitive bilingualism and social bilingualism - is partially confirmed. Implications of the results will be discussed.

Cross-linguistic effects of salience and syntactic function assignment in sentence planning

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Salience influences grammatical structure during production. The more salient a noun, the more likely it will appear earlier in the sentence, usually in a prominent syntactic position such as subject. Additionally, it is also the case that agents tend to be assigned the syntactic function of subjects, and patients that of objects. This means that, in encountering *salient patients*, speakers of a language with relatively strict SVO order, like English, would have to choose between the two preferences: either to encode the patient as an object and not have the salient entity at the beginning of the sentence, or to have the salient entity at the beginning of the sentence by making the patient the subject of a passive sentence, instead of the object of an active sentence. Speakers of languages with freer word order, like Spanish, should not have to make such a choice since the language allows them to place a syntactic object at the beginning of the sentence. Prat-Sala and Branigan [1] gauged the relative weights of these two preferences for native English and native Spanish speakers, comparing sentence type production when patients were the more salient entities. They found that English speakers resolved the conflict by increasing the production of passive sentences (e.g., “the child was ran over by the bike”), while Spanish speakers produced more sentences with dislocated objects (e.g., “al niño lo atropelló la bicicleta”, “the child, the bike ran over”).

The question is what is happening exactly when English speakers choose a passive structure: Are they initially trying to satisfy the two preferences (trying to give the salient patient an early slot in the sentence as well as encoding it as a syntactic object) but later find themselves constrained by the target language into revising the initial syntactic assignments? Or have they already acquired a strategy that directs them to choose a passive straight away whenever the patient is the salient entity?

This question is addressed by testing English-Spanish speakers in their second language, Spanish. When the patient is highly salient, such speakers should either: a) Transfer the native language, English, preference for passives to their second language, Spanish, if they have automatized this processing path; or b) Produce more dislocated object sentences, like native speakers of Spanish do, if there is a universal in-built preference for keeping the patient as the object of the sentence, as well as placing the salient entity earlier.

Preliminary results indicate that speakers start producing more passive sentences in their second language, even though this construction is not appropriate in Spanish. However, as proficiency increases, speakers start adopting more language appropriate ways of satisfying the two preferences, but not necessarily the dislocated object option. In principle, this suggests English speakers appear to indeed automatize the strategy of producing a passive sentence in cases of salient patients, while they remain able to learn a different one.

These results are ultimately also addressing more general questions about the processing of non-linguistic information for its linguistic encoding.

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Interference of German (L1) grammatical gender on pronoun resolution in English (L2) sentence processing

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In some languages, grammatical gender determines the choice of the correct form of the personal pronoun. In these languages, gender information can help with pronoun resolution in language comprehension. However, a bilingual speaker might also experience interference from possibly conflicting information in his/her two languages.

The present experiment investigated whether L1 gender information can influence pronoun resolution in an L2. 30 low-proficient German speakers of English (level A2/B1 according to the European reference frame) read pairs of simple English sentences such as e.g.: “This is a bus. It/*he/*she is big and crowded.” and made grammaticality judgments while ERPs were collected. Pronouns referred to inanimate nouns whose German translation would have either masculine (e.g., “bus”) or feminine (e.g., “feather”) grammatical gender. There were three conditions: In the “correct condition”, pronouns were correct in English but would be incorrect for the German translation (“it”). In the ”pseudocongruent condition”, pronouns were incorrect in English but correct for the German translation (“bus” and “he”/”feather” and “she”). In the “incongruent condition”, pronouns were incorrect for both languages (“bus” and “she”/”feather” and “he”).

The critical condition was the “pseudocongruent condition”. Since the incorrect English pronoun corresponded with the correct gender of the German translation equivalent of the noun referent, it was expected that subjects would perceive the syntactic error as less strong than in the incongruent condition, leading to difficulties in the Grammatical Judgment Task reflected in higher error rates and reaction times than in the “incongruent condition”. ERPs were measured to reveal online syntactic error processing.

Error rates clearly showed that the “pseudocongruent condition” was more difficult than the “incongruent condition”, reflected in significantly higher error rates in the Grammatical Judgment Task. Reaction time differences were as expected but only significant in the subject analysis, possibly due to loss of items because of high error rates. Interestingly, these differences between conditions in the behavioral measures were not reflected in ERP components. While the P600 component revealed a clear difference between the “correct” and “incongruent” and the “correct” and “pseudocongruent” condition, it did not differ between the “pseudocongruent” and “incongruent” condition. Apparently, beginning learners of English made errors because of L1 gender transfer but for some reason these processing difficulties were not reflected in online measures of syntactic processing. Additionally, even though this group of low-proficient speakers was quite homogeneous regarding their level of English, ERPs revealed differences between the lower and higher proficient speakers within this group with respect to sensitivity to L2 gender violations.

Masked translation priming in late unbalanced bilinguals: Evidence from RTs, ERPs and fMRI

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We present a further exploration of masked translation priming, with the specific aim of providing information about the time-course and locus of such priming effects from L1 to L2 and L2 to L1. For a recent review of behavioral masked translation priming studies, using the lexical decision task, see Schoonbaert, Duyck, Brysbaert, & Hartsuiker (2009)[1].

In this study [2], English-French bilinguals performed a lexical decision task while event related potentials (ERPs) were measured to L2 targets (e.g. POMME [APPLE]), preceded by non-cognate L1 translation primes (e.g., apple) versus L1 unrelated primes (L1 to L2), and vice versa (L2 to L1; e.g., pomme-APPLE). We investigated whether specific ERP components can provide evidence for the existence of the much debated L2 to L1 priming effect, and its lexical or semantic locus. Finding a N400 effect in this condition would indicate early semantic activation in L2. Significant masked translation priming was observed, indicated by faster reaction times and a decreased N400 for translation pairs as opposed to unrelated pairs, both from L1 to L2 (Experiment 1a) and from L2 to L1 (Experiment 1b), with the latter effect being weaker (RTs) and less longer lasting (ERPs). These clear N400-priming effects indicate semantic involvement during priming in both directions. The asymmetry of the N400 effects is mostly likely caused by the 100-ms processing delay for L2 targets. A translation priming effect was also found in the N250 ERP component, but this effect was stronger and earlier in the L2 to L1 priming direction than the reverse. These asymmetric N250-effects possibly indicate traces of a strong lexical route of processing when priming from L2 to L1.

We are currently extending these findings with a fMRI repetition suppression paradigm to compare the (locus of) semantic activation in both languages and priming directions [3].

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Using one language can both hamper and help production of translations in another language

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Since both languages of a bilingual become active in the course of speech production, a common assumption is that translation words compete for selection. Such translation competition is at the basis of the issue of bilingual language control, referring to how bilinguals are able to avoid massive interference from the language not in use. Nonetheless, little empirical evidence is available showing that in fact such competition occurs. Furthermore, there are studies indicating that processing a word in one language facilitates production of the translation in the other language. In the current study, we sought to answer this question using a naming paradigm in which subjects first produced written words along with the determiner in one of their languages (e.g., Spanish), and then named pictures in their other language (e.g., Catalan) in a second phase. Crucially, half of the picture names in the second phase were translations of words belonging to the first phase, while the other half consisted of new words. Also, lexical frequency and cognate status were orthogonally manipulated. We observed that for non-cognates, naming in one language had a hampering effect on subsequent naming of the translations in the other language. On the contrary, producing a cognate was easier when its translation had previously been produced in the other language. Results are discussed in the light of models of bilingual language production.

Reading aloud in Persian: ERP evidence for an early locus of the MOPE

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The current study investigates reading aloud words in Persian, a language that omits some of its vowels in the script making the language more opaque compared to many western alphabetic languages, which are often investigated (i.e. Dutch, Spanish, and English). In western alphabetical languages, the so-called *masked onset prime effect* (MOPE) gives some insight into the process of reading aloud. The MOPE reflects faster speech onset latencies for target words that are preceded by a prime sharing its onset with the target (e.g. *custom* – *CARPET*), compared to an unrelated prime (e.g. *powder* – *CARPET*) [1]. Moreover, further research increased our detailed understanding of the MOPE: there is support for the hypothesis that the MOPE is due to phonological (e.g. *kernel* [kɛrnəl] – *CARPET* [kɑrpət]) rather than graphemic onset-overlap (e.g. *circus* [sɪrkəs] – *CARPET* [kɑrpət]) [2, 3, 4]. The current study investigates the MOPE for Persian words by reading aloud Persian words primed by another Persian word that matched in onset (i.e. prime and target overlap phonologically in the onset; e.g. ضریب */zæri:b/*; 'factor' – زبان */zæbɒ:n/*; 'language') or mismatched in onset (e.g. شلنگ */ʃelæng/*; 'hose' – زبان */zæbɒ:n/*; 'language'). The speech onset latencies for the two conditions did not yield any differences (respectively, 708 ms (SD = 80.02) and 705 ms, (SD = 82.63); $t_1(22) = 1.03$, *SD* = 14.59, *ns*; $t_2(47) = 1.03$, *SD* = 20.17, *ns*). However, event-related potentials (ERPs) did reveal a difference in amplitude between these two conditions between 190 and 290 ms after target word onset. The phoneme-match condition (5.49 µV; SD = 0.88) had larger positive mean amplitudes than the phoneme-mismatch condition (4.32 µV; SD = 0.81) in the central brain region ($F(1,22) = 5.56$, *MS*e = 19.73, $p < .05$). This finding constrains the localization and the time course of the MOPE. Furthermore, the absence of a MOPE for Persian in the speech onset latencies and the presence of a MOPE in the ERPs suggest that both lexical and non-lexical routes are simultaneously activated, as assumed by DRC 1.2 [2]. The omission of vowels in Persian generates multiple letter strings within the non-lexical route for a particular opaque word, thereby slowing down processing and eliminating the MOPE (visible in the ERPs) at the endpoint of processing (i.e. reflected in the RTs). Irregular words in English are also slowed down by conflicting pronunciations from the two routes. If the MOPE has indeed been resolved due to conflict resolution in the time course of word processing, ERPs may also reveal a MOPE for irregular words in other languages, such as English.

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Comprehension of relative clauses in a Spanish-Basque bilingual with aphasia

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Agrammatic aphasic patients have been reported to show selective comprehension difficulties on certain syntactic structures with non-canoninal *patient/theme-agent* order, such as relative clauses (RC). In this respect several researchers have shown that agrammatic patients fail to obtain a target-like interpretation of RCs that are reversible, that is, sentences where semantic and pragmatic cues are removed. Agrammatic patients in languages with postnominal relatives like English and Hebrew perform above chance in the comprehension of Subject relatives (SR) where the linear order of the arguments is *agent-patient/theme*. However, they perform at chance level in object relatives (OR) where the linear order of the arguments is *patient/theme-agent* [1]. In contrast, the opposite pattern has been observed in Mandarin, a language with prenominal relatives where the linear order of the arguments is reversed in comparison to English. A comprehension study [2] showed that Mandarin agrammatic patients comprehend ORs (with *agent-patient/theme* order) with greater accuracy than SRs (with *patient/theme-agent* order).

In this paper we present data from a Spanish-Basque bilingual with chronic Broca's aphasia. Spanish is a language with postnominal relatives. Basque, on the contrary, is a language with pronominal relatives. Thus, different predictions can be made for the comprehension of RCs by the subject in this study: preserved comprehension of SRs in Spanish and ORs in Basque and difficulties (if any) in ORs in Spanish and SRs in Basque.

The participant was tested in a sentence-picture matching task carried out in Spanish and Basque in order to assess her comprehension of RCs in both languages. 80 sentences were presented auditorily and the participant had to choose the picture that matched the sentence between two pictures with reversed thematic roles, so that syntax was the only cue to select the correct picture. Among these sentences 40 were active canonical sentences (SVO in Spanish and SOV in Basque) and 40 RCs (20 SRs and 20 ORs).

The results show a preserved comprehension of active canonical sentences in both languages and a different pattern of performance in the comprehension of relative clauses in Spanish and Basque. On the one hand, in Spanish no difficulty is observed in the comprehension of SRs and ORs as they are responded to with an accuracy of 100% and 95% respectively. On the other hand, in the comprehension of Basque RCs ORs are comprehended with a higher accuracy than SRs (86% in ORs and 53% in SRs).

The advantage for ORs attested in Basque is in line with other studies that have analyzed the comprehension of RCs in both typically developing children [3] and adults [4]. Concerning our data, different hypothesis to account for agrammatic performance are considered in order to explain the syntactic impairment that affects ORs in Basque. Besides, the differential impairment in both languages provides new data for the discussion on the processing/representation of these typologically different languages in the bilingual mind.

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Gestures of future teachers in vocabulary explanations to non-natives speakers

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Speakers adapt their speech to their interlocutors, and when they talk to non-native speakers, they tend to engage in *foreigner talk* [1]. They use more basic vocabulary, shorter sentences, and present tense. They articulate more, speak more slowly, talk more loudly, and use gestures. Within second language acquisition research, the adjustments that speakers make in addressing non-native speakers [2] and their effectiveness in facilitating acquisition [3] have been explored. However, gesture in foreigner talk has only been examined in one study [4] which showed that the presence of non-native speakers affected gesture production (i.e. the types of gestures). However, it only found significant differences for the production of deictic gestures (pointing) in both conditions (with natives *vs* non-natives). Nonetheless, those speakers were not trained to deal with foreigners, and we propose that foreign language teachers may act differently.

Foreign language teachers tend to gesture a lot in a classroom [5], [6]. These 'teaching gestures' capture attention and make the lesson more dynamic. They also support comprehension and are relevant for learners' memorization processes [7].

Several aspects of teaching gestures are still not known. Are teaching gestures specific? Are future teachers aware of their gestures before they undergo teacher training? Do they naturally adjust their gestures when performing the same task with native or non-native speakers?

This study explores the differences in the gestures of future French foreign language teachers when they engage in a vocabulary explanation task with native and non-native speakers of French. Verbal and gestural aspects were examined in both conditions, i.e., verbal strategies, vocabulary used, gesture rate, use of gesture space and types of gestures. Preliminary results show that when speaking to a non native, future language teachers tend to use gestures that are more iconic, last longer and use a larger gesture space (i.e. larger gestures) than when speaking to natives.

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Sentence repetition in bilingual language testing and automaticity of sentence processing

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Verbatim sentence repetition is a paradigm widely used to test the language competence of adult and child L1 and L2 speakers. The task is seemingly well suited for the purpose since it involves both comprehension and production of sentences. It is argued that a good knowledge of syntax is required to perform well, since the sentences contain more words than can be held in short term memory. However, from prior work on working memory and sentence recall we know that attentional demands and the automaticity of sentence processing strongly influence performance in this task. Automaticity as one aspect of language ability might be overly stressed in the performance of this task. It is argued that at a very high level, differences in automaticity should not be interpreted as differences in language ability. There is empirical evidence indicating that sentence processing may be less automatized (at least at some levels) even in highly proficient L2 speakers (near-natives) than it is in L1 speakers.

The empirical evidence is supported by current theories which model sentence recall as a combination of sentence comprehension and production, relying on limited attentional resources. More attentional resources are needed for sentence recall if sentence processing is automatized to a lesser degree. This results in a lower performance at this task due to the lower automaticity of sentence processing, even if language competence is native-like. Therefore, this task seems not suited to compare native's and near-native's language competence. The ability of near-natives may be systematically underestimated by this task.

We argue that what is measured with sentence repetition tests is not determined by language ability alone, but determined by the degree of automaticity of sentence processing.

Study 1 tested groups of native and near-native speakers of German with the tasks sentence repetition (auditory and visual presentation) and a German C-Test, assessing language ability. Also, only near-natives participated that could not in conversational and educational settings be distinguished from native speakers. Subjects were matched according to language competence as measured by the C-Test. Near-natives performed significantly lower in sentence recall than natives. A lower discriminatory power of the C-Test could be ruled out by Study 1a. Study 2 applied the same paradigm, testing groups of French-German and German-French bilingual pupils. Again and for both languages, performance in sentence recall diverged from language ability as measured by the C-Test, indicated by interactions between factors TEST and NATIVE LANGUAGE. Study 3 tested groups of native and L2 German speaking 4-year-old children, contrasting a sentence repetition task with a well-established language development test for children. An interaction between factors group and test was found, in the way that L2 German speaking children performed significantly lower in sentence repetition than would be expected from their performance in the language development test.

Our findings have strong implications for models of L2-sentence processing and verbal working memory, as well as for language testing.

Developing mutual exclusivity in the lab

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Monolingual children may use a mutual exclusivity heuristic (a one-to-one mapping between signals and meanings) to constrain the word-learning task [1]. However, recent research has shown that bilingual children do not reliably exhibit mutual exclusivity [2]. That is, children may modulate the way they learn based on the amount of variation in their input. Current research includes experiments on monolingual and bilingual children. However, the exact distribution of variation in the input of these children is difficult to estimate. ME may be more productive when exposed to one language from each parent than when exposed to parents using two languages interchangeably.

The effects of the distribution of variation over speakers was investigated using an artificial language learning experiment run on adults. This allowed fine-grained manipulation of the amount of variation, frequency, feedback and context.

Participants were exposed to two "alien" speakers naming "alien" objects. Participants either saw each speaker use the same, single label for a given object (monolingual), each speaker use a different, single label for a given object (one parent-one language) or each speaker use two labels for a given object (bilingual). After training, participants were given mutual exclusivity tests and a non-linguistic test. Differences in response reaction times reveal a difference in the development of word learning heuristics depending on how the variation in labels is distributed across speakers. This paradigm is presented as a flexible method of investigating the development of word learning heuristics.

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Translation priming and cross-language semantic priming in bilingual infants

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Semantic priming can be studied with ERPs also in infants. The N400 response is smaller to a target word when it is preceded by related than unrelated word (N400 effect). The N400 has been also recorded during translation and cross-language semantic priming task in bilingual adults [(1, 2, 3]. These studies have demonstrated that the N400 is elicited by translation priming tasks, but the magnitude of the response is dependent on direction of translation (L1-L2 versus L2-L1), or proficiency. The N400 effect in priming tasks has not been investigated in developing bilingual brain. In monolingual infants, N400 is shown to be sensitive to target type indicating that semantic closeness of word pairs is automatically processed in infant brain. The aim of current ERP study was to investigate whether semantic priming occurs also during the across-language tasks and whether two languages share the same neural representations. Translation priming and cross-language semantic priming for spoken words were studied in infants exposed to both French (L1) and English (L2). The priming tasks were composed of three different trial types for both languages; translation (cat-chat or chat-cat), related (dog-chat or chien-cat), and unrelated (apple-chat or pomme-cat) word pairs. The results of nine bilinguals (28 months) showed that the N400 response was more pronounced for unrelated than for related targets. However, the effect was stronger for English than for French target words (L1-L2 > L2-L1). Moreover, the N400 effect was differentially lateralized for L1-L2 (right) than for L2-L1 (left) trials. These results indicate that across-language priming effect occurs in bilingual developing brain.

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Language discrimination in monolingual and bilingual infants of Spanish and Basque

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It has been established that newborns use rhythmical properties as a cue for discriminating between languages they have never heard before (i.e., Ramus, 2002), and monolingual infants by 5 months of age are able to distinguish their own native (or familiar) language from an unfamiliar (non-native) one even when they belong to the same rhythmical class (i.e., Nazzi et al., 2000). However, for bilingual infants, both languages are familiar; therefore, they must develop strategies different from those of their monolingual peers to succeed in language separation. The few studies on bilingual infants show that at 4 months they are equally adept at recognizing and discriminating their two native languages as their monolingual peers (i.e., Bosch and Sebastian-Galles, 1997); however, one study suggests that bilingual-to-be 4 –month-olds do not attend to language differences in the same way as their monolingual peers (Bosch and Sebastian-Galles, 2001). In order to further investigate what cues might be crucial to guide bilingual infants toward the development of language separation, we carried out a set of infant and adult perceptual experiments, in addition to the acoustic analysis of Spanish and Basque. These languages are of special interest, as they are morphosyntactically very distinct (Basque: O(bject)-V(erb) word order, heavily agglutinating morphology; Spanish: VO order, inflecting morphology). Yet, their phonological (rhythmic and prosodic) differences are less marked, although they remain only partially explored.

In our acoustic analysis, we measured the rhythmic properties of Spanish and Basque in terms of vocalic and consonantal space (%V and deltaC, as defined in Ramus et al. 1999) and found that Basque has a significantly higher %V than Spanish, similarly to other OV languages. We also measured the acoustic realization of prosodic prominence in terms of pitch, intensity and durational cues (as defined by the Iambic-Trochaic Law, Nespor et al.2008). Contrary to predictions, we found that Spanish makes use of both durational *and* pitch cues, whereas no contrast was found in Basque for any of the cues. In sum, Basque and Spanish show some acoustic differences in their rhythm and prosody, but these are less pronounced than what could be expected given their morphosyntactic differences.

In parallel, language discrimination of Infants in three age groups (3-4 months, 6-8 months, and 10-12 months of age) were measured using the visual habituation procedure in response to Japanese vs. Polish (unfamiliar), and Spanish vs. Basque (familiar). Preliminary results pooling together all age groups and language backgrounds suggest that all infants succeed on the Japanese-Polish discrimination. Data collection for the Basque-Spanish discrimination is underway. As we found relatively small differences between the two languages in terms of prosodic cues, and in particular none of the predicted contrasts in Basque, we also tested adult bilingual (Basque-dominant, as well as Spanish-dominant) listeners' perception of prosodic grouping, in order to reveal perceptual sensitivities to rhythmic patterns that might enhance language differentiation skills.

On the effects of a brief L2 immersion on executive control

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Bilingualism is linked to enhanced cognitive control abilities. Bilingual speakers are faster and suffer less conflict (from the irrelevant information) than their monolinguals counterparts in some attentional tasks (e.g. Simon task). The origin of the bilingual cognitive advantage stems on the continuous engagement of the control mechanisms during speech production that allow bilinguals to ensure lexicalization in the intended language while preventing interference unintended language.

In the present experiment we explore the extent to which this bilingual advantage can be observed in low-proficient bilinguals that for a brief time of immersion in a L2 context will use both languages in a daily-basis. To that aim, we tested a group of German immersed learners living in Spain (Tenerife) in two attentional tasks: the Numerical Stroop task and the Attentional Network task, (ANT). Changes in the magnitude of the conflict effect as a consequence of the immersion experience were explored by comparing the beginning (Arrival testing period) and the end (Departure testing period) of the immersion period. As a control, a group of Spanish monolinguals was tested in the same tasks and at the same temporal moments.

Results on the magnitude of the conflict resolution revealed no differences across the time of immersion between the groups in the ANT task (both groups reduced equally the magnitude of the conflict effect at Departure testing period). In contrast, after few months of immersion, the conflict effect in the Numerical Stroop task reduced significantly for the German immersed group but not for the Spanish monolingual group.

These results suggest that the intensive practice in managing two languages in the L2 immersion context uniquely enhances those cognitive processes directly related to response inhibition. As the Numerical Stroop task, in which participants have to inhibit the automatic response (representation of the number) to respond to the less automatic one (magnitude of the items), immersed learners need to inhibit the lexical representations belonging to the more automatic language (L1) to successfully speak in their less automatic L2.

Paying attention to reading direction: English versus Hebrew strategies among bidirectional/bilingual readers on cancellation tasks

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INTRODUCTION: Cancellation tasks are regularly used to assess selective visuospatial attention as part of a neuropsychological examination. The tasks vary by stimuli type (letter, shape or digit) and format (structured or random array). Past studies on cancellation task performance have found a left-to-right (LR)/top-to-bottom (TB) pattern among left-to-right script readers (e.g., English) and a right-to-left (RL)/TB pattern among right-to-left script readers (e.g., Hebrew, Arabic). These patterns have been associated with both brain-mediated directional biases and reading direction biases. Studies comparing different orthographic systems (such as, kana versus kanji, left-to-right versus right-to-left reading, and phonologically regular versus irregular systems) have found significant differences in the scanning patterns based on the language or orthographic system. Among bidirectional readers, reading direction bias is not straight-forward. The current study investigated whether the ability to read in both directions will affect performance and style on these tasks? Does native language, language proficiency or language condition determine search strategy on a visual attention task?

METHOD: Sixteen low-English, native Hebrew (L-HEB), 13 high-English, native Hebrew (H-HEB), and 14 high Hebrew, native English (EHB) bidirectional readers performed random-array (Mesulum & Weintraub, 1985) and ordered-array (Diller et al., 1974) letter and shape cancellation tasks presented in English and in Hebrew. Reading group and language environment were compared for Start location and Strategy using chi square tests, and Error rates within quadrants were analyzed with a repeated-measures ANOVA.

RESULTS: For Start Location and Strategy, differences were seen for the ordered-array tasks (letter and shape). L-HEBs preferred to start at the left hemispace and use a LR/TB strategy during the English environment, but started at the right and used a RL/TB strategy during the Hebrew environment. For error rate by quadrant, there were no differences in terms of reading group or language environment.

CONCLUSION: In contrast with monolinguals, bidirectional readers did not exhibit a directional bias in completing random-array cancellation tasks. On ordered-array tasks that resemble text, however, a language-dependent bias was seen for the L-HEBs only. Overall, the current study confirmed the role of reading direction on the visual search and attention process. With non-verbal stimuli, an automatic bias to use the preferred language's reading process direction to scan structured arrays appears to possibly balance out the right hemisphere pull to scan the world from left-to-right. We discuss the possible interaction between visual material, orientation of attention, reading direction and brain organization.

Cognitive control and lexical selection during monolingual development

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Word selection for overt production is often described as a process in which lexical information is retrieved from long term memory. This retrieval process involves a discrimination or selection stage in which the most appropriate representation is singled out from among alternative candidates. Given these requirements, linguistic discrimination abilities could well be grounded on general response selection abilities, such as those considered in cognitive control theories.
This interpretation is supported by observations from the domain of bilingualism. The comparison of bilingual and monolingual speakers' performance in cognitive and attentional control tasks (e.g. the Simon task) has repeatedly shown better performance for bilinguals. This effect is attributed to the fact that bilinguals are constantly required to discriminate among their two languages in their everyday word selections. Such additional discrimination requirement, compared to monolinguals, would result in improved domain general cognitive control abilities.
We tested this view by pushing the logic one step forward. If there is a close link between word selection and general response selection processes, this link should be apparent under varied circumstances, even if the variation in lexical abilities is not driven by a single explicit cause such as bilingualism. The natural variation in word selection abilities present across individuals could be similarly linked (no causality intended) to general response selection abilities.
We conducted a computer based experiment run in the classroom, where pupils were tested one by one. Young healthy participants, self-declared monolinguals speakers, from grades 3 and 5 (N~80) were asked to perform four different tasks requiring response discrimination based on perceptual information, preponderant response inhibition, or verbal knowledge. The tasks were: a perceptual (hue) discrimination task, the classic Simon task, primed lexical decision and naming pictures in blocks. The comparisons of performance, notably the effects of discrimination difficulty, show little or no correlation across participants between the abilities to select each type of response.
The absence of relationship (null effect) between tasks allows no more than specualting about the processes at stake in the different tasks. One possibility is that the effect of bilingualism is massive compared to inter-individual differences, such that it completely overrides the latter. Alternatively, the response selection indexes used (Simon effect for general control, and semantic interference for word selection) may be too narrow to capture the relationship among language and control. Overall, this research invites further investigations of what in the bilingual language use promotes cognitive control, and not only which aspects of cognitive control are or are not promoted.

Bilingual disadvantage and frequency effects in language production revealed by Event-Related Potentials: Evidence from Spanish monolinguals and Spanish-Basque bilinguals

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The present study set out to investigate whether we could find an electrophysiological signature for the difference between bilinguals and monolinguals. We recorded EEG on 32 scalp electrodes from Spanish-Basque bilinguals and Spanish monolinguals during an L1 picture-naming task. Half of the pictures corresponded to high-frequent words (e.g., *libro* 'book'), the other half to low-frequent words (e.g., *patin*, 'roller-skate'). Each of the pictures was presented six times in six separate experimental blocks in a different pseudo-randomized order. Behavioural results showed effects of repetition (each repetition leading to faster naming latencies), frequency (high frequent faster than low frequent) and group (monolinguals faster than bilinguals). Consistent with earlier studies (1), we found divergent ERP waveforms between 200 and 550 ms following stimulus onset, for low versus high frequency (low frequent items eliciting a greater negativity than high frequent items), and, interestingly for bilinguals versus monolinguals (bilinguals exhibiting a greater negativity than monolinguals). We also observed a progressive increase in negativity for each repetition (aggregated across frequency and groups). Implications for models of bilingual speech production will be discussed.

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The effect of L1 syntax on the agreement of L2 possessive structures: Evidence from eye-tracking

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Previous studies have suggested an effect of L1 syntax on L2 agreement processing [1,2]. In a previous work, we investigated this question and concluded that L1 syntactic rules seem to affect the production of possessive structures in production of language [3]. In the present study, we investigated whether such influence also occurs in comprehension of language. We contrasted the performance of a group of English native speakers with two groups of advanced late bilinguals (Spanish- and Greek-English) in a reading task involving possessive pronouns and adjectives. The bilingual groups were selected according to the similarities and differences between their L1 syntax and the English syntax. In English, the possessive pronoun and adjective agree with the *possessor* in gender in the singular (i.e., *his/her, his/hers*), but are not gender marked in the plural (i.e., *their, theirs*). Greek follows the same pattern as English. In Spanish, in contrast, the possessive adjective agrees with the *possessee* in number but not in gender (i.e., number: *su/sus*, for both masculine and feminine); the possessive pronoun agrees in both number and gender with the *possessee* (i.e., number: *suyos/suyas*, gender: *suyo/suya*, for masculine and feminine respectively).

In an eye-tracking experiment, we presented sentences in which the gender congruence of possessive adjectives and possessive pronouns was manipulated. We used masculine and feminine characters as possessors (e.g., the wizard/the witch) and related them to family members (e.g., *Yesterday the witch kissed her daughter and left quietly*.). We manipulated the possessive pronouns and adjectives so that they were either congruent in gender with the possessor or not (e.g., *Yesterday the witch kissed her/his daughter and left quietly*.). This manipulation did not affect the grammaticality of the sentence (i.e., the daughter could be John's daughter for example) but we still expected longer reading times in case of gender incongruence between the possessor and the adjective/pronoun. We also manipulated gender matching between the possessor and the possessee (e.g., *Yesterday the wizard said the daughter/son was his in this TV show*). As predicted, preliminary results showed that English native speakers were affected by this manipulation as reflected by longer reading times when the gender of the possessor and the adjective/pronoun conflicted. The analyses for groups revealed a significant interaction between group and congruence for the native speakers and the Spanish-English bilinguals, whose L1 agreement rules conflict with those of English. In contrast, no interaction was found between the native speakers and the Greek-English bilinguals, whose L1 rules pattern those of English. These results suggest that L2 agreement may be affected by the L1 syntactic rules, at least in the case of possessive structures.

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Bridging linguistics and cognitive neuroscience: An event-related potential study of code-switching

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A recent corpus-based study of code-switching in nominal constructions (Herring et al., in press) attempted to evaluate the Matrix Language Frame approach (Myers-Scotton, 2002) in relation to a competitor. However, because of the paucity of relevant naturally occurring data we designed a study to evaluate the Matrix Language Frame approach experimentally by using neurocognitive measures. In the present study, we investigated the acceptability of code-switchingby using a sentence verification task with event-related potentials (ERPs). Welsh-English bilinguals read sentences presented one word at a time at a fixed speed. At the end of each sentence, two pictures were presented and the bilinguals were asked to select the picture which matched the sentence. The language of the matrix verb, the adjective, and the noun and the word order of the nominal construction (the adjective + the noun) were manipulated. According to the MLF theory, code-switching is acceptable when the language of the matrix verb is the same as the language of the word order. For example, *I saw one black **ci*** ('I saw one black dog') is acceptable for the MLF because the verb *saw* is from English as is the adjective-noun order. In contrast, *I saw one **ci*** black would not be acceptable because the noun-adjective order is not normal in English even though the verb *saw* is from English. It was predicted that the latter type of sentences should produce an enhanced negativity between 300 and 500 ms (left anterior negativity: LAN) and an increased positivity between 450 and 850 ms (late positive component: LPC) relative to the former type of sentences. The results will be discussed in the light of these predictions.

Masked translation and repetition priming effects in trilinguals

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Bilingualism and its implication in terms of language processing and human memory is one of the most important topics nowadays in neurolinguistics. However, many questions remain about the abilities of bilinguals to process two languages and to switch from one language to another. In the present research, we examined masked translation and repetition priming effects in a group of proficient French/English/Spanish trilinguals, using behavioral measures and event-related potentials (ERPs). Participants were presented with a set of English and Spanish target words, that could be preceded by their repetitions (an identity condition), their translation in the two other languages, or by unrelated words (in the three languages). Participants were asked to perform a lexical decision respectively in L2 and in L3. Stimuli for primes and targets were non-cognate words. In Experiment 1, only behavioral data were recorded. Results showed a significant masked repetition effect for both English (L2) and Spanish (L3) targets. A masked translation priming effect was found for each target language and for both prime languages (L1L2 / L3L2; L1L3 / L2L3). The ERP results of Experiment 2 provide converging evidence. Results showed a significant masked repetition effect for both English and Spanish targets, notably in the N250 and N400 components. Moreover, as in Experiment 1, there was a masked translation priming effect in the N400 component for both prime languages (L1L2 / L3L2; L1L3 / L2L3), and the amplitude of the N400 translation priming effect was similar across these conditions. Finally, we found a language switching effect (prime is a word in the same language as the target, or a word in another language) in both the N250 and N400 components. This language switching effect was particularly large when it occurred between the two non-native languages (L2 to L3 and L3 to L2). According to the BIA model [1], switch cost arise from bottom-up processing from a given language node conducted by the presentation of a word in that language, leading to the inhibition of the lexical representations from other languages. When several languages are involved, the activation of the language node is determined by the language of the preceding word. If prime and target are in different languages, the activation of the language node of the prime is incompatible with the target, which slows the processing. In our experiment, it is also true when the two primes are in different languages, which also could explain the slowdown of processing in translation priming. In addition, according to the IC model [2], the observed cost could be the result of the setting of an executive control related to the way participants control their decisions and their answers in an artificial task. Here, the task schema for translation must actively suppress representation of words with a language tag recently activated at the level of the selection output. This suppression is much complex to operate when the number of languages in the task is important, which could explain the larger switch costs observed when prime and target are not in the same language.

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Differences and similarities in automatic syntactic processing in native and nonnative speakers of English

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Several factors have been suggested to account for differences in native and nonnative parsing, including lack of linguistic knowledge, native language influences, cognitive factors and maturational changes in nonnative speakers.[1] The current study explored the influence of cognitive factors, specifically whether native and nonnative speakers use qualitatively different processes in parsing.

It has been argued that qualitative differences in syntactic processing cannot be shown by response time (RT) data alone.[2] Segalowitz and Segalowitz showed that the coefficient of variance (CV) of response times allows the differentiation between automatic and attentional processing, offering a measure of response variability that is corrected for response speed. Automatic processing, they argue, is not only fast, it is less noisy and less variable, resulting in smaller standard deviations and a smaller CV. Attentional processing may be slower, but this is not a necessary feature of attentional processing as practice may lead to faster completion of attentional processing routes. Thus though two participant groups may have similar RTs, they may be using different processing routes, as indicated by differences in CV. Conversely, two groups may differ in RTs, but use similar processing routes, as indicated by similar CVs.

The current study used two word monitoring experiments to explore sensitivity to gross syntactic violations and noun phrase (NP) and verb phrase (VP) violations in native and university-level nonnative speakers. RTs and CVs across conditions in both experiments were statistically similar for both groups, indicating qualitatively similar (automatic) parsing of NPs and VPs in native and nonnative speakers. Both groups showed faster and less variable responses for the well-formed conditions in contrast to scrambled sentences and NP and VP violations. However, there were two main differences between groups: firstly, in Experiment 1, nonnative speakers showed a hyper-priming effect for the determiner condition in which plural noun targets were preceded by “the”. This could be due to premature automatic processing or the inability to inhibit processing.[3] Secondly, in Experiment 2, RT data for nonnative speakers showed a weaker effect for the violation of intransitive verbs, i.e., noun targets followed intransitive and transitive verbs. This effect may be due to shallower parsing in nonnative speakers or lack of linguistic knowledge of verb transitivity.

Thus, the current study contributes behavioural data in support of qualitatively similar (automatic) syntactic parsing in native and nonnative speakers for some aspects of noun and verb phrase structure.

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Ineffective L2 parsing and developing grammars: An eye-tracking study on auxiliary selection in L2 Italian

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I report an eye-tracking and acceptability judgments study on auxiliary selection in L2 Italian. Research questions are: (i) if learners have a grammatical or a statistical rule for auxiliary selection; (ii) if this rule drives online processing; (iii) if the eye-tracking technique can tell us something about such a rule. Subjects (n.25 + 7 controls) judge (Yes|No) the acceptability of sentences (n. 32 + 32 fillers) displaying right or wrong auxiliaries while eyes movements are recorded. Subjects are initial learners of Italian. They differ as to L1s, instructional background and recency of instruction. To see whether a grammatical rule is at work, the design contrasts *type* (n=8) and *mismatching* (n=8) verbs. *Type* verbs are those for which the syntactic (unaccusative vs. unergative) and semantic (telicity vs. agentivity) distinctions are supposed to be relevant to determine either auxiliary. *Mismatching* verbs take both auxiliaries or take an unexpected auxiliary (given the semantic template). To see whether a statistical rule is at work, I regress different reading measures (e.g. first pass, total reading times) as random variables on both token frequency of constructions and backward transition probability (BTP, the probability of having word *n* -1 given *n*) scores as fixed factors in a mixed effect logistic regression. Data suggest that either subjects do not have an automatized (procedural/implicit) rule or – if they have one – it is still opaque to eye-tracking measures. On one side, high frequency of (auxiliary + past participles) constructions, high BTP scores, alphabetical L1s and recency of instruction increase the possibility of having target-like acceptability judgments. On the other, (i) none among these factors speeds up reading times or affects reading patterns (both early and late measures); (ii) inter-subjects variability is high. Also when the most recently instructed, alphabetical-L1 learners pattern alike with native controls in acceptability judgments, their reading is not disrupted when illegal auxiliaries occur. It is possible that either our subjects' performance reflect only a declarative knowledge of auxiliaries or – as long as learners are not “attuned” to the target-language – eye tracking measures (unlike ERP's) can not reveal whether a procedural rule for auxiliary selection is at work. Eye-tracking data are inconclusive to prove whether initial L2 processing is fed by L2 grammar. Initial stages of developing L2 grammars are opaque to reading measures. Such measures are eclipsed by the temporary ineffectiveness of the parser/processor.

The bilingual advantage: Conflict monitoring, cognitive control, and garden-path recovery

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Mounting research findings demonstrate that balanced bilingualism confers certain advantages related to cognitive control (CC). Bilinguals often outperform monolinguals specifically on 'conflict' trials requiring the ability to resolve interference among competing representations [1]. Other results suggest bilinguals respond generally faster across trial types during high conflict-*monitoring* conditions [2]. Here, we show that bilinguals' domain-general CC advantage impacts garden-path recovery: practice on a high (but not low) conflict-monitoring memory task differentially affects sentence reanalysis (which requires CC; see [3]) in bilinguals versus monolinguals.

Balanced Spanish-Catalan bilinguals and Spanish monolinguals completed three tasks in this order: a (Spanish) reading task involving temporarily ambiguous sentences with a preferred subject-first or dispreferred object-first cleft interpretation; a brief high- or low-interference (randomly assigned) N-back task; and a posttest reading task. Comprehension probes tested lingering misanalysis of object-first sentences [4]. In N-back, subjects viewed words sequentially, indicating whether an item appeared 3 trials previously. The high-interference version contained *lures*, words appearing 2, 4, or 5 items earlier; here, subjects had to override a familiarity bias to correctly respond that the item was not a 3-back target.

In the high- (but not low-) interference N-back, bilinguals were more accurate than monolinguals ($p<.01$), but language-group did not interact with trial type. Thus, this benefit is not restricted to conflict trials (lures), but reflects a general advantage in high conflict-monitoring conditions. In the reading task, participants spent longer in disambiguating regions of, and were less accurate on, object- versus subject-first items ($p's<.01$), but no interaction with group emerged. Bilinguals were more accurate than monolinguals across all sentence types ($p<.05$), revealing their comprehension advantage was not specific to garden-path recovery. Finally, only bilinguals' improvement *on lure trials alone* of the N-back task selectively predicted improvement on object-first comprehension from pre- to posttest ($r=.39$, $p<.05$), which forced syntactic reanalysis and CC. Apparently, only bilinguals transfer the benefit of brief interference-resolution practice to the revision of parsing misanalyses. Bilingualism bestows a cognitive benefit (non-specific to conflict trials) in high conflict-monitoring tasks with repeated switching between conflict and non-conflict trials. In reading, only bilinguals' brief interference resolution practice yields improved recovery from early misinterpretations. Our findings support bilinguals' conflict-monitoring advantage, which enables them to detect situations requiring CC and flexibly increase domain-general conflict-resolution mechanisms shared by syntactic ambiguity resolution processes.

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Bilingualism and executive control: The role of switching

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The last decades, a lot of studies have shown that being a bilingual enhances the performance on executive control tasks [1-3]. It is hypothesized that resolving the constant competition between the two languages is an important factor: the constant need to select the words in the target language and to inhibit the words in the non-target language should lead to a stronger and better developed executive control mechanism, which leads to a better performance on cognitive control tasks [4]. Being a *balanced* bilingual would train this control mechanism even more, since it is harder to manage the competition between two equally proficient languages.

The goal of our study was to investigate the role of language switching in the development of the executive control system. Therefore, we tested three groups of Dutch-French bilinguals: a group of unbalanced bilinguals, balanced bilinguals that do not often switch between languages in their daily lives, and bilinguals that regularly switch between their languages. We used a flankertask and a Simon arrow task to compare the executive functions of the three groups.

The results show unbalanced bilinguals and non-switching balanced bilinguals did not show different cognitive control performance, whereas the switching bilinguals did show better cognitive control, compared to the other two groups.

These data show that not the level of proficiency in both languages, but rather the amount of switching plays a crucial role in the development of the cognitive control mechanism. Theoretical implications of these findings will be discussed.

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The role of input in bilingualism: are there downsides?

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In this paper we report a study of the size of the early bilingual lexicon of pre-school children with a Russian or Kazakh L1 background placed at immersion kindergartens with, respectively, the other language as the means of communication and instruction. The purpose of our study was two-fold. We first wanted to provide corroboration that bilingualism is beneficial not only in the long term, but also in the process of language development (Bialystok, 2001; 2008[1],[2]). Our second aim was to establish the size of the early lexicon of both bilingual and monolingual speakers of Russian and Kazakh.

We used the Peabody Picture Vocabulary Test (PPVT) (Dunn & Dunn, 2007[3]). There were 4 groups in the study, 2 control monolingual groups, a Kazakh L1 group (N= 20; MA 3;6) and a Russian L1 group (N= 20; MA 3;5), and two bilingual groups, a Kazakh L1 with Russian as L2 group (N= 10; MA 3;8), and a Russian L1 with Kazakh as L2 group (N= 10; MA 3; 7). We report performance based on the raw scores from the responses, and based on filtered data with outliers removed.

Our original hypothesis concerning the advantages of bilingualism for language development, and the size of the comprehension lexicon was confirmed. Both bilingual groups outperformed significantly their age-matched monolingual controls ($p < .05$). Thus the Russian L1 bilingual children performed better in Russian than the Russian monolingual children, and the Kazakh L1 bilinguals were better on Kazakh than their monolingual Kazakh peers.

As expected, the Russian L1 bilingual children performed better in their L1, Russian, compared to their performance in the Kazakh L2. Our unexpected finding was that the Kazakh L1 bilingual children outperformed significantly their Russian bilingual peers on Russian, and performed significantly worse than the Russian bilingual group on Kazakh ($p < .05$).

We provide an explanation of this puzzling finding by the status of Russian as dominant language in the Northern part of Kazakhstan where the testing was conducted. Thus, most likely, the Kazakh L1 bilinguals have received massive input in Russian both at the immersion kindergarten and in society at large. Similar findings have been documented concerning the acquisition of English as the dominant language in Wales (the UK) (Mueller Gathercole & Môn Thomas 2009[4]). While the Russian L1 bilinguals appear to be balanced bilinguals with quite similar results in their L1 and L2, this does not apply to the Kazakh L1 bilinguals. Our tentative explanation here is in terms of the sociolinguistic situation and the history of Kazakh, which has been in intense contact with Russian over the past century, with heavy Russian influence especially in terms of lexical borrowings (Schlyter, 2004 [5]). This situation is now gradually starting to change with new Kazakh native words coming back to the language. In light of such gaps in the Kazakh lexicon, the Kazakh L1 learners are clearly at a disadvantage.

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