

PiF 2024

Psycholinguistics in Flanders

27th-28th May 2024

Contact:
PsychInFlanders2024@gmail.com

The Brussels Centre for Language Studies
welcomes you to Brussels
for the 21st edition of PiF!

Table of Contents

Conference Program Overview	- 3 -
Programme	- 4 -
Day 1 - 27 May	- 4 -
Day 2 - 28 May	- 7 -
Useful Information	- 10 -
Keynote Talks	- 12 -
Book of Abstracts	- 14 -
D1R1S1: Language control	- 14 -
D1R1S2: Acquisition	- 16 -
D1R1S3: Bilingualism	- 18 -
D1R1S4: Prediction	- 21 -
D1R2S1: Clinical psycholinguistics	- 23 -
D1R2S2: Production 1	- 27 -
D1R2S3: Comprehension/ Tools	- 29 -
D2R1S1: Word processing	- 31 -
D2R1S2: Language switching	- 33 -
D2R1S3: Production 3	- 35 -
D2R1S4: Sentence processing	- 37 -
D2R2S1: Production 2	- 39 -
D2R2S2: Aphasia	- 40 -
D1R2S3: Learning & education	- 43 -
List of Authors	- 44 -
Scientific Committee	- 49 -
Organising Committee	- 49 -

Conference Program Overview

	Day 1- 27 May	
09:00	Registration	
09:50	Opening remarks	
	Room 1	Room 2
10:00	Session 1: Language control	Session 1: Clinical psycholinguistics
11:00	Break	
11:30	Keynote: Stefano Cappa	
12:30	Lunch	
13:30	Session 2: Acquisition	Session 2: Production 1
14:30	Break	
14:45	Session 3: Bilingualism	
15:45	Break	
16:30	Session 4: Prediction	Session 3: Comprehension/Tools
19:30	<i>Social event (optional) at Brussels Beer Project (Bailli)*</i>	
	Day 2- 28 May	
09:00	Registration	
	Room 1	Room 2
10:00	Session 1: Word processing	Session 1: Production 2
11:00	Break	
11:30	Keynote: Angela de Bruin	
12:30	Lunch	
13:30	Session 2: Language switching	Session 2: Aphasia
14:30	Break	
14:45	Session 3: Production 3	
15:45	Break	
16:30	Session 4: Sentence processing	Session 3: Learning & education
17:30	Closing remarks	

* After the presentations of Day 1, join us at **Brussels Beer Project (BBP) in Bailli** (Rue du Bailli 1/A, 1000 Bruxelles) for drinks and networking. Guests are responsible for their own drinks and food. Our reserved space will be on the top floor.

Programme

Day 1 - 27 May

Room 1

09:00-09:50	Registration		
09:50-10:00	Opening remarks		
10:00-11:00	<div>Session 1: Language control</div> <div>Chair: Mathieu Declerck</div>	<ul style="list-style-type: none">▪ Lisan Broekhuis, Universiteit Antwerpen Exploring the limits of language non-selectivity in multilinguals▪ Agnesa Xheladini, Vrije Universiteit Brussel Language Control in Bilingual Comprehension: Insights from the Bilingual Flanker Task▪ Layana Awada, Université Toulouse Jean Jaurès Language control in High Frequency Code-switchers: Ecological and experimental evaluation of language production and executive functioning▪ María Sánchez , Vrije Universiteit Brussel The influence of sentence production and linguistic context on bilingual language control	
11:00-11:30	Break		
11:30-12:30	<div>Keynote Talk</div> <div>Chair: Rose Bruffaerts</div>	Stefano Cappa	Primary progressive aphasia as a window into language neurobiology
12:30-13:30	Lunch		
13:30-14:30	<div>Session 2: Acquisition</div> <div>Chair: Maria Sanchez</div>	<ul style="list-style-type: none">▪ Matilde Ellen Simonetti, Aachen University The Impact of Overlapping Mappings on the Acquisition of word meanings▪ Saioa Cipitria, Vrije Universiteit Brussel The role of perceptual salience in implicit L2 morphology acquisition▪ Georgia Knell, Vrije Universiteit Brussel Stand-out: A systematic review of the role of salience in second language acquisition▪ Eleni Zimianiti, Max Planck Institute for Psycholinguistics Between-item variability: Dutch Past Tense Predictors	
14:30-14:45	Break		
14:45-15:45	<div>Session 3: Bilingualism</div> <div>Chair: Thomas Caira</div>	<ul style="list-style-type: none">▪ Kristin Thomsen, Université Côte d'Azur, CNRS & Vrije Universiteit Brussel Experience-Based Individual Differences Modulate Cognitive Processing in Multilingual Individuals: A pilot study▪ Oleksandra Osypenko, Lancaster University	

Room 2			<p>Investigating language effects on cognition using three-gendered languages: The case of Ukrainian simultaneous bilinguals</p> <ul style="list-style-type: none"> ▪ Anna Dalakoura, Vrije Universiteit Brussel The post-translation environment ▪ Merel Muylle, Gent University The transmission of semantic, lexical, and orthographic information in young and older bilinguals' written word production
	15:45-16:30	Break	
	16:30-17:30	<p>Session 4: Prediction</p> <p>Chair: Sarah Stolle</p>	<ul style="list-style-type: none"> ▪ Pernelle Lorette, University of Mannheim The use of (non-)transferable semantic cues and gender cues in L2 prediction ▪ Ana Bautista, Basque Center on Cognition, Brain and Language (BCBL) On how word predictability in a sentence context varies depending on language and nativeness ▪ Marco Sala, University of Padova In the words of others: How speaker identity shapes phonological prediction ▪ Andrea Belluzzi, University of Trento The Role of Semantic Control Regions in generating Active Prediction for efficient information processing
Room 2	10:00-11:00	<p>Session 1: Clinical psycholinguistics</p> <p>Chair: Stefanie Keulen</p>	<ul style="list-style-type: none"> ▪ Ainhoa Leyaristi, University of the Basque Country Two elicitation tasks to identify morphosyntactic markers of Developmental Language Disorder in Basque: narrative and sentence repetition ▪ Stéphanie De Keulenaer, Universiteit Antwerpen Systematic Review: Electrophysiological Markers of Language in Neurodegenerative Diseases ▪ Anastasia Lada, Vrije Universiteit Brussel A Systematic Review: Idiom Comprehension in Alzheimer's Disease: the Role of the Executive Functions ▪ Rosie Coppieters, Universiteit Antwerpen Mini-Linguistic State Examination (MLSE): Preliminary Findings in Primary Apraxia of Speech (PAOS)
	11:00-11:30	Break	
	11:30-12:30		
	12:30-13:30	Lunch	

13:30-14:30	<p>Session 2: Production 1</p> <p>Chair: Esli Struys</p>	<ul style="list-style-type: none"> ▪ Yanan Wang, Leiden University Chinese Verbal Classifier Processing in Verb-Phrase Naming: An ERP Study ▪ Sarah Stolle, Vrije Universiteit Brussel & University of Freiburg Grammatical gender in Slovak word production: An event-related potential study ▪ Franziska M. Schulz, Max Planck Institute Who is a fluent speaker? Working memory might tell! ▪ Yaqian Wang, Leiden University The representation of Mandarin Chinese noun-noun compounds in language production
14:30-14:45	Break	
14:45-15:45		
15:45-16:30	Break	
16:30-17:30	<p>Session 3: Comprehension/ Tools</p> <p>Chair: Agnesa Xheladini</p>	<ul style="list-style-type: none"> ▪ Cecília Hustá, Max Planck Institute Effects of Relatedness between Speech Planning and Comprehension Content on Attentional Distribution - Rapid Invisible Frequency Tagging (RIFT) study ▪ Sandra Bethke, Max Planck Institute Developing the Individual Differences in Language Skills (IDLaS-DE) Test Battery—A new tool for German ▪ Emma Depuydt, Gent University Identifying neural networks involved in phoneme categorization through EEG source imaging and functional connectivity analysis ▪ Qi Zhang, Leiden University Planning strategies in grammatical encoding: Behavioural and electrophysiological evidence from sentence production

Day 2 - 28 May

Room 1

09:00-10:00	Registration		
10:00-11:00	<div>Session 1: Word processing</div> <div>Chair: Agnesa Xheladini</div>	<ul style="list-style-type: none">▪ Cheng-Yu Hsieh, University of London Stacking Chinese characters: Insights from computational modelling▪ Rachel Lemaitre, Gent University Bilingual word recognition: investigating source and item memory in Spanish-English speakers▪ Martina Mancano, University of Trento Interoceptive grounding of Social and Emotion concepts: an rTMS study▪ Ziheng Cheng, Leiden University Number in Mandarin Chinese: Behavioral and electrophysiological evidence regarding their activation and selection	
11:00-11:30	Break		
11:30-12:30	<div>Keynote Talk</div> <div>Chair: Esli Struys</div>	Angela de Bruin	Bilingual language switching: The role of the current language context and overall language environment
12:30-13:30	Lunch		
13:30-14:30	<div>Session 2: Language switching</div> <div>Chair: Maria Sanchez</div>	<ul style="list-style-type: none">▪ Elena Benini, Aachen University The role of phonology in written language switching: can between-language conflict be reduced by down-regulating phonological activation?▪ Annalisa Arcidiacono, University of Bergen Grammar in Bilinguals: Parallel activation or switching between grammars?▪ Noémie Baulande, UT2J (Univeristy of Toulouse) Switching languages or speech registers: are similar control processes at play?▪ Oona Cromheecke, Gent University Effects of age and sex on cerebral processing of language and task switching	
14:30-14:45	Break		
14:45-15:45	<div>Session 3: Production 3</div> <div>Chair: Anna Dalakoura</div>	<ul style="list-style-type: none">▪ Orhun Uluşahin, Max Planck Institute Existing Talker Information May Hinder Convergence in Synchronous Speech▪ Mélen Guillaume, University of Lille & Université Grenoble Alpes Framework for modeling the rhythmic organisation of speech and the impact of perceptual cues on production▪ Jules Fumel, University of Lille Rhythmic Priming and Speech Production: link between Neural Entrainment and Sensorimotor Synchronization	

Room 2			<ul style="list-style-type: none"> ▪ Caitlin Decuyper, Max Planck Institute How stable are effects of word frequency and name agreement in picture naming? A two-session repetition priming study
	15:45-16:30	Break	
	16:30-17:30	Session 4: Sentence Processing Chair: Mathieu Declerck	<ul style="list-style-type: none"> ▪ Jin Wang, Leiden University Processing of Visual Shape Information in Chinese Classifier-Noun phrases ▪ Lara Baert, Universiteit Antwerpen Syntactic priming as a means of learning a new grammatical construction? ▪ Fahd Amin, RPTU Kaiserslautern-Landau Cross-Linguistic Priming of Ungrammatical Structures: A Study on French-English Bilinguals ▪ Kübra Nur Çetin, RPTU Kaiserslautern-Landau Examining cross-linguistic ungrammatical priming of reciprocal structures: The impact of dominant language
	17:30-17:40	Closing remarks	
Room 2	10:00-11:00	Session 1: Production 2 Chair: Thomas Caira	<ul style="list-style-type: none"> ▪ Rianne van Lieburg, Universiteit Antwerpen Tree for three: the phonological representation of /θ/ in L1 Dutch-L2 English speakers ▪ Giada Antonicelli, Basque center on Cognition, Brain and Language (BCBL) Interpreting prosody: acoustic analysis and online rating of speech acts and emotions ▪ Silke Marie Crols, Université du Luxembourg Effect of home language on spelling error patterns in primary school children ▪ Isabella Vornehm, N/A When should we ask? The role of linguistic input in the acquisition of questions
	11:00-11:30	Break	
	11:30-12:30		
	12:30-13:30	Lunch	

13:30-14:30	<p>Session 2: Aphasia</p> <p>Chair: Rose Bruffaerts</p>	<ul style="list-style-type: none"> ▪ Silke Coemans, Vrije Universiteit Brussel A comparison of cerebellar tDCS effects in non-fluent PPA and post-stroke aphasia ▪ Mustafa Seçkin, Istanbul University Agrammatism in Turkish: Eye Tracking Evidence of Morpheme Selection Impairment in Primary Progressive Aphasia ▪ Mara Barberis, KU Leuven Latent cluster analysis to capture language profiles in the acute phase post-stroke ▪ Yana Criel, Gent University Persistent language network functional connectivity alterations in the individuals recovering from a brain injury acquired during childhood versus acquired during adulthood
14:30-14:45	Break	
14:45-15:45		
15:45-16:30	Break	
16:30-17:30	<p>Session 3: Learning & Education</p> <p>Chair: Sarah Stolle</p>	<ul style="list-style-type: none"> ▪ Ding Yan, University of Lille Towards a Quantifiable Measure of Orthographic Congruency Between 2 Languages ▪ Junior Vargas, University of Lille In search of the mechanisms of word learning: Understanding the pathway from configuration to engagement ▪ Thomas Caira, Vrije Universiteit Brussel Are CLIL pupils always in two minds? Investigating the effects of language mixing on immediate and delayed recall of information ▪ Beatrijs Wille, Gent University Language development and differentiation in bilingual education Dutch-Flemish Sign Language

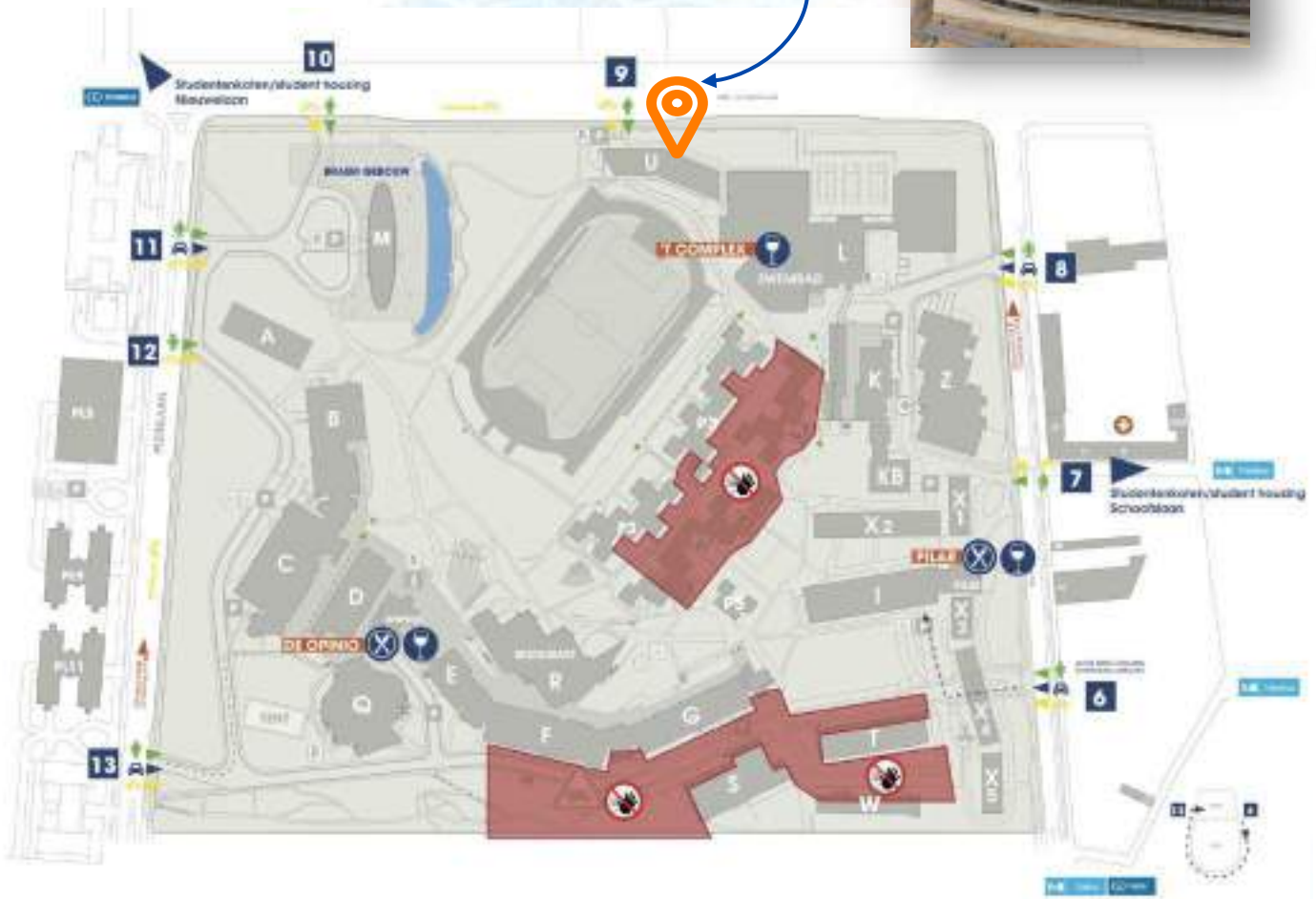
Useful Information

The venue:

U-Residence ([Blvd Général Jacques 271, 1050 Ixelles](#))

VUB Main Campus

Conference rooms: ground floor of the U-Residence building.



How to get there:

By train

You can find timetables for all train services on the [SNCB website](#)

U-Residence is a 6-minute walk from **Etterbeek Station**.

By metro/tram

- Metro lines 1 and 5: Stop at **Pétillon**. U-Residence is a 15-minute walk.
- Tram lines 7 and 25: Stop at **VUB**. U-Residence is just opposite the tram stop.

By bus

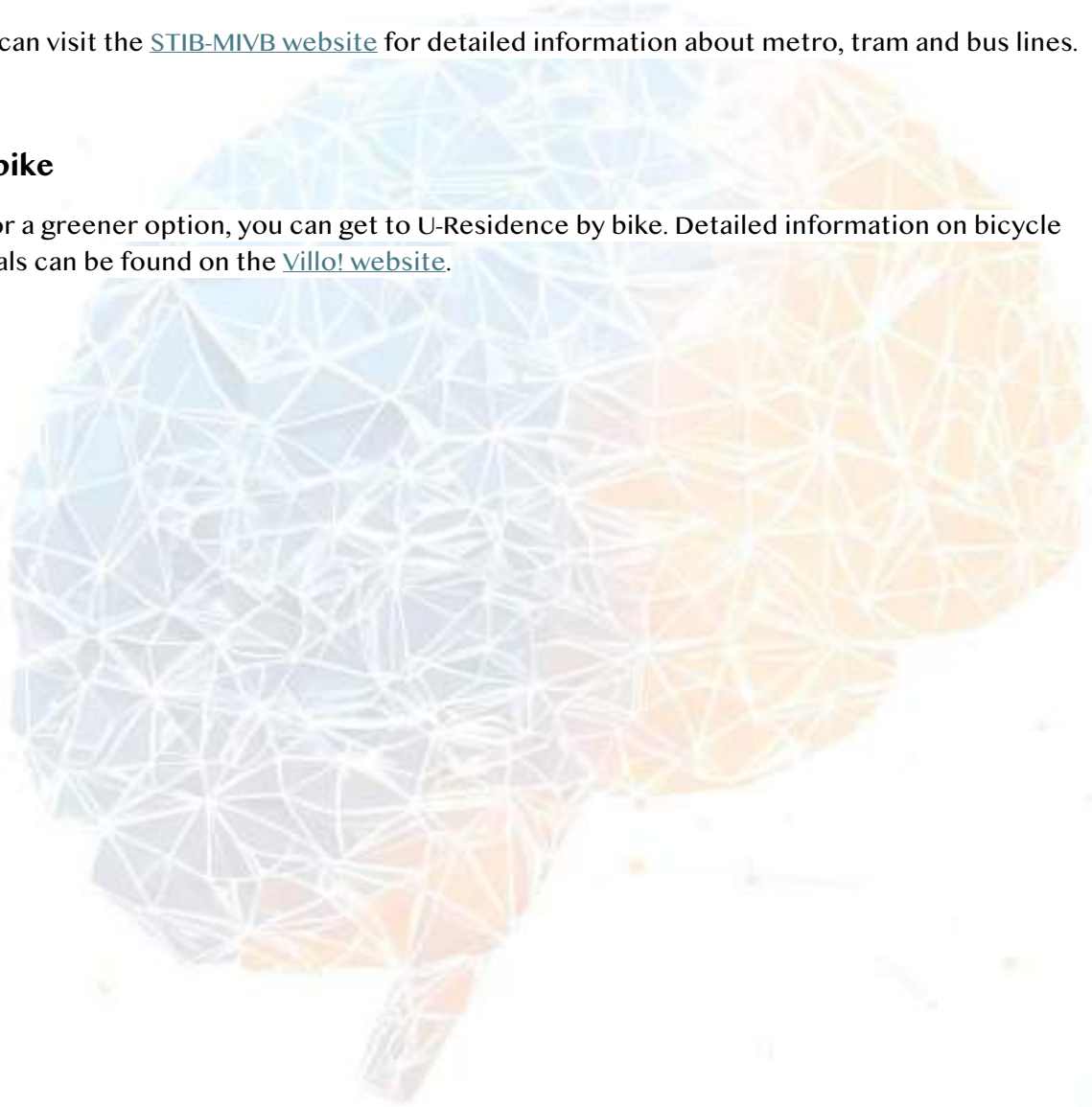
Nearby bus stops:

- Etterbeek Gare (lines 95, E11)
- Ixelles Plaine (line E11)
- Elsene Etterbeek Station (lines R75, R78)
- Arsenal (lines 34, 543)

You can visit the [STIB-MIVB website](#) for detailed information about metro, tram and bus lines.

By bike

As for a greener option, you can get to U-Residence by bike. Detailed information on bicycle rentals can be found on the [Villo! website](#).



Keynote Talks

27 May, 11:30



Stefano Cappa

University Institute of Advanced Studies (IUSS) and IRCCS Mondino Foundation, Pavia, Italy

Primary progressive aphasia as a window into language neurobiology

Primary progressive aphasia (PPA) is a group of syndromes due to different neuropathological substates, providing a window into language neurobiology that is complementary to the traditional investigation of language disorders

due to stroke and to neuroimaging studies in healthy subjects. The psycholinguistic and neuropsychological analysis of errors in production tasks and of performance in language comprehension in PPA and in other neurodegenerative disorders has provided important insights into the mechanisms of progressive language dysfunction and its neurobiological underpinning. The different syndromes of PPA can be considered as system disorders, reflecting the progressive, graded involvement of the main brain network subserving language function: the non-fluent/agrammatic variant mainly affecting the motor speech /morphosyntactic aspects of linguistic organization; the semantic variant the dysfunction of lexical/semantic processing; and the logopenic/phonological variant the lexical/phonological network.

28 May, 11:30



Angela de Bruin

University of York, United Kingdom

Bilingual language switching: The role of the current language context and overall language environment

Language switching is a common practice for many bilinguals, but the frequency and type of switching can depend on the context they are interacting in. The context can furthermore influence the language-control mechanisms bilinguals can use when switching languages. In this talk, I will first discuss the impact of the current language context on language switching and control, referring to studies working with different bilinguals (e.g., Basque-Spanish, Mandarin-English, and Bulgarian-English). I will discuss how language control varies depending on the type of switching task (comparing cued and voluntary switching) and the influence of the conversation partner a bilingual is interacting with. This will be followed by a discussion of recent longitudinal research examining potential changes in language control after bilinguals move to a new language environment. Together, the studies suggest language control adapts rapidly to the immediate context a bilingual is communicating in, with less of an impact of the overall language environment in which a bilingual lives.

Book of Abstracts

D1R1S1: Language control

Title: Exploring the limits of language non-selectivity in multilinguals

Researcher(s): Lisan Broekhuis

Affiliation: Universiteit Antwerpen

Bilinguals commonly yield cognate effects in L2 lexical decision tasks (LDTs), which suggests that they are unable to “switch off” contextually irrelevant languages (Dijkstra et al., 1999). To examine whether such effects can even arise for interlingual words that do not exist in L1 (Dutch), our LDTs also include English- French (E-F) cognates and interlingual homographs (IHs). Furthermore, we compare the processing of the interlingual items to that of similar intralingual words: cognates to pure English metonyms and IHs to pure English homographs. Although we found significant inhibition for the non-native (E-F) items in a GNGT, these items evoked no sig. effect in our English LDT. However, in this LDT, the native Dutch speakers did evince sig. Dutch-English (D-E) cognate facilitation and (only in the exp. blocks without D-E IHs) sig. inhibition for the English homographs. A second English LDT without interlingual stimuli also showed sig. English homograph inhibition. In our current experiments, we present all stimuli in either high- or low-constraint sentences to establish whether a (semantically rich) pure English sentence context can fully suppress the activation of the L1 and a non-native language (French).

Title: Language Control in Bilingual Comprehension: Insights from the Bilingual Flanker Task

Researcher(s): Agnesa Xheladini, Esli Struys & Mathieu Declerck

Affiliation: Vrije Universiteit Brussel

Bilingual comprehension is an immensely complex process in which both languages are activated simultaneously, leading to cross-language interference. The process that helps bilinguals navigate through this interference is called language control, and it does so by increasing their chances of selecting words in the target language. While language control has been extensively researched in production literature, there is a noticeable gap in understanding how this process works during comprehension. That is why our main goal is to investigate the presence and nature of language control during written bilingual comprehension. In the present study, we will test Dutch natives with English as their second language. To this end, we will utilize the Bilingual Flanker Task with an extra condition – neutral condition (containing non- words). Through this task we aim to gain insight about the underlying mechanism of language control, namely inhibition. While in production-based literature there are a few measures that account for this claim (i.e., asymmetrical switch costs, n-2 language repetition costs, reversed language dominance, and blocked language order effect), the same have not been as indicative in comprehension studies. Overall, this ongoing study will give us the opportunity to answer crucial questions about inhibition as the most probable underlying mechanism of language control during bilingual comprehension.

Title: Language control in High Frequency Code-switchers: Ecological and experimental evaluation of language production and executive functioning

Researcher(s): Layana Awada & Barbara Köpke

Affiliation: Université Toulouse Jean Jaurès

Bilingualism calls for the use of two (or more) languages, depending on the conversational context. Language control (LC) depends on various variables, both internal (proficiency level, age of acquisition, dominance) (Bonfieni et al., 2019) and external (interlocutors, context) (Green & Abutalebi, 2013). Green and Abutalebi's Adaptive Control Hypothesis (2013) focuses on external variables, suggesting three interactional contexts: single-language, dual-language and dense code-switching (CS). The latter is specific of communities where multilingualism is common and CS is a frequent habit, such as the Lebanese community, where Arabic, French and/or English are used and mixed in daily conversations. According to Green and Wei's Control Process Model of CS (2014), a LC scale ranging from open to competitive control allows more or less CS to take place in bilingual discourse. Competitive control is related to single-language context, where the relevant language is activated and the other inhibited. Cooperative and coupled control are relative to dual-language context, whereas open control is specific to dense CS, requiring less LC. In order to study this link between CS and LC, recent research measures the cost of switching languages (switch costs, mixing costs, reversed language dominance...) (Declerck & Koch, 2022), under the light of reactive and proactive inhibitory control (Green, 1998). Most studies have been conducted in a laboratory setting (Kleinman & Gollan, 2016; Costa & Santesteban, 2004; Meuter & Allport, 1999), using artificially cued paradigms that may explain effortful switching (thus switch and mixing costs). More recently, in an extended literature review, Blanco-Ellorrieta and Pykkänen (2018) claimed the need for more naturalistic paradigms to characterize cognitive processes underlying language switching (LS).

We will present the preliminary results of our study conducted on High Frequency Lebanese Code-Switchers speaking French, with the general aim of understanding the link between LC and CS. The study involves a joint experimental and ecological evaluation of LS through a holistic protocol: after an evaluation of language history (LEAP-Q), language dominance (BLP) and code-switching habits (BCSP), we assess the participants' proficiency in their second language (CEL). The experimental tasks involve:

- an assessment of switch and mixing costs through a bilingual picture naming task following Costa and Santesteban's (2004) cued language-switching paradigm,
- an assessment of executive functions evaluating inhibition, shifting and updating (Miyake et al., 2000): Flanker task, Stroop task, Wisconsin Card Sorting Test and digit span (WAIS-IV).

As for the ecological task, we suggest a semi-structured discussion with multiple speakers, where language mode (Grosjean, 2008) is manipulated, in order to test the participants' adaptation to their respective interlocutors' language knowledge.

We expect to find symmetrical switch costs in highly proficient French speakers, as higher L2 proficiency was found to reduce switch cost asymmetry (Costa & Santesteban, 2004). Our hypothesis also predicts a mixing benefit in high frequency code-switchers, similar to De Bruin et al.'s postulate (2018). Our study further aims at investigating the controversial correlation between general executive control abilities (Prior & Gollan, 2013; Declerck et al., 2017) and specific LC abilities in high code-switchers, in order to

disentangle domain-general and domain-specific hypotheses (Bobb, Wodniecka & Kroll, 2013).

Title: The influence of sentence production and linguistic context on bilingual language control

Researcher(s): María Sánchez¹, David Peeters², Esli Struys¹ & Mathieu Declerck¹

Affiliation: ¹Vrije Universiteit Brussel & ²Tilburg University

Multilinguals are unique in their ability of switching back and forth between two or more languages in adaptation to a linguistic environment. Language control supports this ability by helping multilinguals reduce cross-language interference. Traditionally, language control has been investigated using single-word picture-naming paradigms, where participants are told what language to use and when by a visual or an auditory cue (e.g., a color or a high-pitched vs low pitched tone). While this line of research has helped us enlarge our understanding of language control, in real life settings, language choice is not always externally imposed, and language production usually involves complex syntactic constructions beyond the single word level. In this talk, we will present findings from an online study where 30 French- English bilinguals switch between languages in a sentence context parting from a picture description task. We compare findings from two linguistic contexts: one where participants can choose when to switch (voluntary language switching), and one where they are told when to switch (cued language switching).

Results: Currently, data collection has been completed, but the processing of the data is still underway.

D1R1S2: Acquisition

Title: The Impact of Overlapping Mappings on the Acquisition of word meanings

Researcher(s): Matilde Ellen Simonetti¹, Megan G Lorenz², Iring Koch¹ & Tanja C Roembke¹

Affiliation: ¹RWTH Aachen University & ²Augustana College

Previous research has shown that acquiring complex word-object mappings (e.g., words with multiple meanings) is harder than acquiring simple ones (e.g., words with only one meaning). However, people may retain more flexibility for complex mappings, allowing them to be remapped to new meanings as necessary. This may be particularly true for bilinguals, who more commonly acquire multiple, overlapping word mappings. To investigate this question, more than 150 bilingual participants completed a cross-situational word-learning task across three experiments with two learning phases (LPs). In LP1, they acquired both one-to-one (1:1; one word maps onto one object) and one-to-two-mappings (1:2; one word maps onto two objects). In LP2, each word acquired in LP1 received a new meaning to see how easily both 1:1 and 1:2 mappings are remapped. Across experiments, we found that it was harder to acquire 1:2 than 1:1 mappings. In Exp. 1, as predicted, it was also easier to remap 1:2 than 1:1 mappings at the beginning of LP2. In Exp. 2, the opposite pattern for remapping was observed. Thus, in Exp. 3 (ongoing), we are collecting data to clarify why 1:2 mappings may be remapped more easily than 1:1 mappings under some circumstances but not others.

Title: The role of perceptual salience in implicit L2 morphology acquisition

Researcher(s): Saioa Cipitria, Georgia Knell, Marije Michel, Hanneke Loerts, Ludovic De Cuypere, Esli Struys & Alex Housen

Affiliation: Vrije Universiteit Brussel

Acquiring morphology poses a big challenge in second language acquisition. One potential facilitator is salience, which is theorized to aid language acquisition by directing learners' attention to certain linguistic elements (Goldschneider & DeKeyser, 2001). To empirically investigate the impact of perceptual salience, an eye-tracking experiment was conducted with 68 L1 Dutch speakers who read 240 sentences in Englishi, an English-based semi-artificial language featuring high- (*-ulp*) and low-salient (*-o*) morphemes according to orthographic length. Within an implicit learning paradigm, participants were assigned to intentional or incidental learning contexts. The task consisted of two phases: a learning phase involving input flooding, and a testing phase where participants completed a grammaticality judgment task. Results revealed a significant influence of salience, mediated by learning context and English proficiency, on fixation durations, thus confirming the effect of perceptual salience on attention allocation in L2 morphology acquisition.

Title: Stand-out: A systematic review of the role of salience in second language acquisition

Researcher(s): Georgia Knell, Saioa Cipitria, Ludovic De Cuypere, Alex Housen, & Esli Struys

Affiliation: Vrije Universiteit Brussel

The concept of salience in second language acquisition (SLA) has gained interest since Goldschneider and DeKeyser's (2001) meta-analysis found key factors to explain morpheme acquisition order in English. They theorized that these factors comprise different manifestations of linguistic salience, suggesting its important role in second language (L2) learning. However, empirical research on this relationship remains scarce, particularly that which manipulates salience as an independent variable. To address this gap, this systematic review analyzed existing studies that empirically manipulate various salience manifestations in SLA contexts. Methodological choices and additional variables were also analyzed. We extracted 473 references from Web of Science and Scopus databases, of which 42 were selected for analysis. Results showed a positive correlation between greater degrees of salience and L2 learning outcomes, but also remaining gaps in research on isolated salience manifestations in general, and psycholinguistic manifestations specifically.

Title: Between-item variability: Dutch Past Tense Predictors

Researcher(s): Eleni Zimianiti¹, Lilian Ye², Abe Hofman^{2,3}, Rogier Kievit⁴, Caroline Rowland^{1,4} & Seamus Donnelly^{1,5}

Affiliation: ¹Max Planck Institute for Psycholinguistics, ²Prowise Learn, ³University of Amsterdam, ⁴Radboud University & ⁵Australian National University

A hotly debated research topic in language development is the acquisition of past tense, which has been seen as a test case for understanding the nature of innate knowledge and its role in language acquisition. However, previous studies have tested the acquisition of past tense via corpus analysis, in which errors are rare, or elicitation tasks, in which tested items are few, resulting in limited between-item variability. To overcome

these weaknesses, we analysed data from a uniquely large and longitudinal dataset containing 333 verbs, collected via an educational online platform in 38,550 Dutch-speaking children aged 8-12 years old. This age range allows to examine errors and verb-level difficulty at an age when children still make past tense overregularization errors. We examined whether form-frequency, phonological neighbourhood density (PND) and telicity predict the verb-level difficulty of past tense forms in Dutch. Dutch is a language understudied for its inflectional forms, while presenting unique vowel changes in the formulation of past tense for a large number of verbs (e.g., Present Simple: helpen (help), Simple Past: hielp, Present Perfect: geholpen). These changes constitute phonological “neighbours” that can be used as phonological analogies to construct past tense forms. Our findings suggest a key role for form-frequency in the Simple Past and little evidence for PND and telicity, while for the Present Perfect PND plays the key role.

D1R1S3: Bilingualism

Title: **Experience-Based Individual Differences Modulate Cognitive Processing in Multilingual Individuals: A pilot study**

Researcher(s): Kristin Thomsen^{1,2}, Stefanie Keulen², Fanny Meunier¹ & Seçkin Arslan¹

Affiliation: ¹Université Côte d'Azur, CNRS & ²Vrije Universiteit Brussel

Introduction

Research into the effects of multilingualism on cognition has seen a significant increase in recent decades. Therein, multilingual language use has been shown to significantly modulate not only brain structure and function (see Pliatsikas and Luk, 2016), but also domain-general cognitive processes (Bialystok, 2017; Grundy et al., 2017). The specific impact of multilingualism on neurocognitive processes has sparked considerable debate, largely because of inconsistencies in results across studies (see de Bruin et al., 2015; Paap et al., 2015; Leivada et al., 2021). Studies have often simplified the complex nature of multilingualism to a binary variable, overlooking its nuanced impact on neurocognitive processes. However, recent research has argued that multilingualism is a continuum, marked by diverse experiences that may differentially modulate brain structure and function (DeLuca et al., 2019). Moving beyond the binary dichotomy of bilingualism, this study employs a Multilingual Language Diversity (MLD) measure to assess contextual language dominance (Li et al., 2019). MLD is a score ranging from 0 to 2, derived from an assessment of a participant's self-reported proficiency and frequency of language use across different components of up to four languages, offering a measure of dominance beyond mere daily usage estimations. Drawing on pilot data from four French-English multilingual participants and six English-French participants, the study aims to focus on individual variability in multilingual language experiences and address whether variations within MLD modulate inhibitory control.

Methodology

Participants. This abstract presents pilot data from a total of 12 adult multilingual speakers recruited at Université Côte d'Azur in Nice, France. Four participants were French(L1)- English bilinguals, and six participants were English-French(L2) bilinguals (9 females, mean age = 30.6, age range = 24-58). Four participants reported speaking two

languages, five participants reported speaking three languages, and three participants reported speaking four languages. The participants had normal or corrected-to-normal vision and were admitted following a demographic questionnaire. Data collection for this project is ongoing.

Materials and procedure. The participants completed the Language History Questionnaire 3 (LHQ; Li et al., 2020) and the Flanker task (Eriksen & Eriksen, 1974). We focus on the LHQ as a continuous measure of multilingualism, and the flanker task to test the inhibition component of executive functioning (see Miyake et al., 2000). The flanker task was administered using the PsychoPy software (Peirce, 2007) and consisted of two blocks of 120 trials each presented in a randomised order: 40 incongruent trials, 40 congruent trials and 40 neutral trials. The participants responded to a total of 240 trials, each of which begun with a fixation cross in the middle of the screen presented for a randomised duration of 400 to 1600ms. The fixation cross allowed the participants to both focus their attention on the centre of the screen and reduce saccades. Afterwards, a 200ms baseline blank screen appeared followed by the stimulus, which was presented until the participant responded or for a maximum of 1500ms. An inter-trial interval (ITI) blank screen of 600ms followed to avoid eventual carryover effects. Accuracy and responses times (RTs) were recorded and analysed.

Results

The participants' MLD scores ranged from 0.80 to 1.99 (mean = 1.36, median = 1.44, sd = 0.40) indicating a moderate to strong level of multilingual language dominance diversity across the group. The participants accuracy of responses on the Flanker Task was very high. Eleven participants had an error rate of less than 5% (15% congruent trials), while one participant had an error rate of 25% (47.5% congruent errors). Outputs from a linear regression model fitted with the Flanker Task RTs data showed quicker responses in the congruent (mean = 437.4, sd = 0.07) than the incongruent condition (mean 523.40, sd = 0.09; Intercept $\beta = 0.45$, SE= 0.01, $t = 45.78$, $p < .001$; Condition $\beta = 0.12$, SE= 0.01, $t = 8.58$, $p = .001$). The fixed effect for MLD scores was marginal ($\beta = -0.01$, SE= 0.006, $t = -1.77$ $p = 0.07$), however, there was a significant interaction effect between Condition and MLD scores ($\beta = -0.03$, SE= 0.01, $t = -3.31$ $p < .001$). This suggests that MLD scores modulate congruent/incongruent responses differently, more specifically, the higher multilingual language dominance diversity they had, the quicker RTs were elicited on incongruent trials.

Discussion

This study explored the potential relationship between multilingual language dominance (MLD) and inhibitory control measured by a Flanker Task. Our results have shown that dominance scores predict response latency from incongruent trials. This is in line with the previous studies which showed that multilingual language use modulates domain general cognitive processes (see e.g., Bialystok, 2017; Grundy et al., 2017). We revealed a trend toward higher cognitive efficiency associated with greater language diversity, suggesting a that multilingual language diversity has a potential influence on cognitive processing efficiency in the flanker task. This was supported by a significant interaction proving that incongruent trials pose only minimal challenge for individuals with relatively high MLD scores. Our findings support the conceptualisation of bilingualism as a continuum, in concordance with the framework proposed by DeLuca et al. (2019), highlighting the importance of considering individual variability in multilingualism. However, our finding needs to be interpreted with caution as Li et al.'s (2020) original

multilingual language dominance diversity account may not fully capture language usage. This is primarily because participants actively using two languages often register a still low MLD. Finally, the current results are based on pilot data with a small sample size reported.

Title: Investigating language effects on cognition using three-gendered languages: The case of Ukrainian simultaneous bilinguals

Researcher(s): Oleksandra Osypenko¹, Silke Brandt¹, Aina Casaponsa¹ & Panos Athanasopoulos²

Affiliation: ¹Lancaster University & ²Lund University

Does language modulate our cognition? Recent studies suggest moving beyond this binary question to focus on the specific circumstances under which language-related effects emerge. The current study investigates whether language effects differ when looking at two- vs. three-gendered languages and whether the presence of neuter grammatical gender mitigates language effects. In addition, we explored the effects of language on bilinguals' cognition. More specifically, we attempt to analyse the effects that two contrasting three-gendered grammatical systems (e.g., Ukrainian and Russian) have on cognitive processes, as well as introduce simultaneous bilinguals into the linguistic relativity research. This extends the focus beyond sequential bilinguals with a distinct L1 and a later acquired L2. To examine whether simultaneous bilinguals will demonstrate a language effect similar to that of sequential bilinguals – specifically, the influence of grammatical gender on categorisation – the current study adapts a similarity judgement paradigm, presented in a seminal experiment from Phillips and Boroditsky (2003). We hypothesised to find language effects for both Ukrainian and Russian, as nouns' gender in both languages is indicated by various structural properties (e.g., the endings of nouns, adjectives, etc.) typically overlooked by researchers (Lucy, 2016).

37 English monolinguals and 63 Ukrainian-Russian bilinguals participated in the current study. They rated the similarity of 100 pairs of stimuli, comprising depicted conceptually neutral nouns, presented alongside a picture of a male or female character (e.g., notebook and a ballerina) on a 9-point Likert scale. We included nouns with opposite grammatical genders in Ukrainian and Russian (masculine in Ukrainian and feminine in Russian, and vice versa), and nouns with matching genders in both languages (e.g., masculine in both Ukrainian and Russian). Two key predictions were tested using linear mixed models. Firstly, for nouns with matching grammatical gender in both Ukrainian and Russian, we expected to find a more pronounced language effect compared to English monolinguals, with bilingual participants providing higher ratings for pairs where biological sex of the character and grammatical gender of the object were congruent in both Ukrainian and Russian. Secondly, for nouns with mismatching genders in Ukrainian and Russian, we anticipated an effect driven by the most proficient language within the bilingual group (i.e., higher ratings to pairs where biological sex of the character and object's grammatical gender were congruent in their most proficient language).

Our results suggest that gender congruence of object-character pairs had no statistically significant impact on similarity ratings. Moreover, Ukrainian participants consistently rated objects as less similar than their English monolingual counterparts across all conditions. As for the second prediction, we found no difference between the ratings of pairs that are congruent and incongruent in participants' most proficient language. The current study found no language effects on categorisation in speakers of two three-gendered languages, when including a neuter grammatical gender condition,

suggesting a need for further investigation whether language effects of three-gendered languages emerge when omitting neuter gender.

Title: The post-translation environment

Researcher(s): Anna Dalakoura¹, Tamar Degani², Florentina Drobotă¹, Melis Dilara Özilhan¹, Dania Carolina Rivera Diaz¹, María Sánchez¹, Stefanie Keulen¹ & Mathieu Declerck¹

Affiliation: ¹Vrije Universiteit Brussel & ²Haifa University

The complex act of translation involves cognitive and linguistic processes that bilinguals regularly engage in. While research has extensively delved into the cognitive mechanisms at play during translation, little consideration has been directed towards the post-translation environment. The aim of our study is to investigate the aftereffect of translating on subsequent language production using the blocked language order effect paradigm. Participants will perform in three blocks; Block 1 and Block 3 will consist of a network description task, while Block 2 will consist of a sentence translation task. In the network description task, participants will describe the route of a red dot that follows different types of lines moving from one picture to another in their L2. In the translation task, participants will orally translate (L1→L2) six-word sentences, which were presented to them in written form. The participants of this experiment will be Greek-English bilinguals, aged 18-50. We will measure lexical errors and filled pauses and compare performance in Block 1 vs Block 3. We expect decreased language performance in Block 3 due to language control.

Title: The transmission of semantic, lexical, and orthographic information in young and older bilinguals' written word production

Researcher(s): Merel Muylle¹ & Gonia Jarema²

Affiliation: ¹Ghent University & ²Université de Montréal

Older adults may have weakened connections between words and their sounds/spelling, which affects top-down, but not bottom-up language processes (Burke et al., 1991). Similarly, bilinguals may show weaker connections in the same system because the frequency of input for each language is lower than in monolinguals (Gollan et al., 2008). We studied whether younger (N= 54) and older (N= 54) French-English bilinguals experienced top-down and bottom-up orthographic facilitation during the typewritten naming of English pictures while ignoring a visual distractor word. Half of the targets were interlingual homographs (e.g., "fort", which means "loud" in French) that were paired with a semantic distractor ("castle"), a top-down orthographic distractor ("loud"), that was semantically related to the L1 French word, or an unrelated distractor. The other half were non- homographs (e.g., "flag") appearing with a semantic ("stake"), (bottom-up) orthographic ("flame"), or unrelated distractor. We found semantic interference, but no top-down orthographic facilitation in either group, whereas only the older adults showed bottom-up orthographic facilitation. These findings support the idea of weakened connections in bilinguals and old age.

D1R1S4: Prediction

Title: The use of (non-)transferable semantic cues and gender cues in L2 prediction

Researcher(s): Pernelle Lorette

Affiliation: University of Mannheim

Research suggests that prediction supports language comprehension but might be more challenging for second (L2ers) than for first language speakers (L1ers). This discrepancy may stem from L1ers' and L2ers' distinct ability to use different types of cues to form predictions. In a visual-world eye-tracking experiment, 21 German L1ers and 19 L1-French/L2-German speakers heard 96 German SVO sentences while seeing a visual display containing four images: one depiction of the object of the sentence and three distractors / competitors. The sentences contained either no cue to enable prediction [NO-PREDICTION CONDITION], or the object of the sentence could be predicted based on the verb semantics [SEMANTIC CONDITION], the gender marking of the article [GENDER CONDITION], or a combination of both types of cues [SEMANTIC+GENDER CONDITION]. In the semantic condition, half of the items involved the position verbs *stellen*[put.LIE] or *legen*[put.STAND] (this semantic contrast is not encoded in French), while the other half contained verbs with a translation equivalent in French (e.g. *essen*[eat]). Mixed-effects regressions on aggregated proportions of looks to the target showed that both L1ers and L2ers used the semantics of non-position verbs to form predictions. However, gender marking and the semantics of position verbs were only used by L1ers and led to delayed and lower proportions of predictive looks to the target compared to the semantics of non-position verbs.

Title: On how word predictability in a sentence context varies depending on language and nativeness

Researcher(s): Ana Bautista & Clara Martin

Affiliation: Basque Center on Cognition, Brain and Language (BCBL)

Most research on language comprehension requires pre-testing stimuli to ensure specific properties. For the investigation on word anticipation during sentence comprehension, it is particularly relevant to obtain measures of the predictability of target words in specific sentence contexts. This is usually done through cloze tests, in which people are asked to provide continuations to incomplete sentences with the word(s) they deem more appropriate. Testing participants with similar profiles in the cloze test and the main experiment using the pre-tested material is crucial, especially when testing bilingual participants and/or comparing different languages. In fact, the predictability of certain words in sentences might differ when people process sentences in their native (L1) or non-native (L2) language, and across languages. For the present norming study, we performed a cloze test on 330 incomplete sentences translated to Spanish and French with three groups of participants: native speakers of Spanish, native speakers of French, and Spanish-French bilingual speakers. The results will offer insights into the predictability of words in a given sentence context, depending on the language (Spanish or French) and the nativeness (L1 or L2). These comparisons hold significant implications for refining cloze test practices and enhancing general methodologies in second language comprehension research.

Title: In the words of others: How speaker identity shapes phonological prediction

Researcher(s): Marco Sala, F. Vespignani, S. Gastaldon, L. Casalino & F. Peressotti

Affiliation: University of Padova

Introduction: Prediction models usually assume that the linguistic system is able to pre-activate phonological information. However, evidence for a pre-activation of phonological information is mixed and controversial. We capitalized on the fact that foreign speakers typically make systematic phonological errors to investigate whether speaker-specific phonological predictions are made based on speaker identity (native-vs-foreign).

Methods: We recorded EEG from 45 participants reading sentence fragments after which a final word was spoken by either a native- or a foreign-accented speaker. The spoken final word could be predictable or not, depending on the sentence's meaning. The identity of the speaker (native-vs- foreign) may or may not be cued by an image of the face of the speaker.

Results: The presence of the speaker identity cue is associated with a smaller N400 (300-600ms) when the word is predictable and not when it is not predictable.

Conclusions: Speech prediction allows the pre-activation of phonologically specified representations on the basis of flexible and finely tuned processes capable of accommodating interindividual phonological variability.

Title: The Role of Semantic Control Regions in generating Active Prediction for efficient information processing

Researcher(s): Andrea Belluzzi

Affiliation: University of Trento

We performed 2 fMRI studies to investigate whether semantic control regions generate active predictions and to determine which areas are facilitated in processing predicted information. In study 1 (N=20), participants read sentences with two protagonists interacting with items. Sentence alternation allowed to anticipate the next item in half trials, while the other half remained unpredictable. Study 2 (N=25), introduced cut trials where the item at the end of the sentence was removed, allowing to dissociate anticipatory from post-stimulus mechanisms. Study 1 revealed that predictable trials activated a left-lateralized network (IFG, pMTG, IPS) overlapping with semantic control regions, which we labeled Prediction Network. In contrast, unpredictable trials engaged semantic areas (precuneus and left AG), with decreasing activity as predictability increased. Study 2 replicated these results and showed that the Prediction Network was more active for predictable cut trials, confirming its anticipatory role. Overall, the Prediction Network supports an anticipatory mechanism that exploits patterns to generate active predictions. This affects the computational load of semantic areas, which will process predicted information more easily.

D1R2S1: Clinical psycholinguistics

Title: Two elicitation tasks to identify morphosyntactic markers of Developmental Language Disorder in Basque: narrative and sentence repetition

Researcher(s): Ainhoa Leyaristi

Affiliation: University of the Basque Country

Background: Prolonged morphosyntactic errors have been considered the hallmark of Developmental Language Disorder (DLD) (Leonard 1998). However, research results vary based on the assessment method (Castilla-Earls et al. 2021), L1 and age of the participant (Thordardottir 2016).

Aim: This study compares and contrasts two elicitation task methods to identify morphosyntactic signs of DLD in Basque. Following Tuller et al. (2012), I assume that computationally complex structures (i.e. finite verbs and embedded clauses) will be difficult.

Methodology: The participant is an L1 Basque bilingual speaker with DLD signs (age:11;04) and he has been assessed with narrative tasks and sentence repetition: audio-visual elicitation, MAIN (Gagarina et al. 2020) and B-LITMUS-SR (Tuller et al. 2018, Basque adaptation by Etxeberria et al. unpublished).

Results: The tasks have revealed contradictory results in this one-sample study. The narrative tasks show that ungrammaticalities based on the number of tokens is low, but errors have been distributed over half of the verb types in the matrix and embedded clauses. Conversely, B- LITMUS-SR barely detected ungrammaticalities.

Conclusions: Each task has its advantages, but also limitations. Some morphosyntactic aspects

have been identified to be complex in both tasks, but others just in the narration. In sum, to avoid results being mainly subject to instrument type, an assessment conducted with different methods is needed.

Title: Systematic Review: Electrophysiological Markers of Language in Neurodegenerative Diseases

Researcher(s): Stéphanie De Keulenaer¹ , Sara Van Mossevelde^{1,2} , Tobi Van den Bossche^{1,2} , David Crosiers^{1,2} , Patrick Cras^{1,2,3} , Tommas Ellender¹ , Rose Bruffaerts^{1,2}

Affiliation: ¹Universeit Antwerpen, ²University Hospital of Antwerp & ³IBB-Neurobiobank

An early and accurate diagnosis enables optimal care of patients with neurodegenerative diseases. Electroencephalography (EEG) shows advantages in terms of availability, comfort, cost and time- effectiveness compared to routinely used diagnostic tools such as e.g. neuropsychological testing or the collection of cerebrospinal fluid. This systematic review aims to evaluate the diagnostic utility of electrophysiological markers in Alzheimer's disease (AD), Frontotemporal Dementia (FTD) including Primary Progressive Aphasia (PPA), and Lewy Body Dementia (LBD). Considering the variable prevalence of language deficits in the three populations, we opted to scope the literature related to semantic processing separately.

The review was registered with PROSPERO (ID: CRD42023392253). We systematically searched databases Pubmed, Cochrane, Web of Science, and Scopus for articles published from 2000 to January 2023. Our complete search string defined a total of 12010 studies, 714 papers were eligible for full- text screening after removal of duplicates and screening of the abstracts by 2 blinded reviewers. Additionally, three eligible articles were added. For the language sub-review, only articles including a semantic event-related (ERP) paradigm were selected. Sixteen articles were selected for full text screening, of which 12 were included. Regarding participant characteristics, eight studies included individuals diagnosed with AD, while four studies studied differences in PPA subtypes. Interestingly, one study compared AD to semantic variant PPA (svPPA). Notably, no study included LBD participants.

Our findings highlight the N400 component, elicited by a semantically unexpected stimulus, as the most prominent ERP-marker across populations. Alterations in amplitude, latency or topography of the N400 were reported in all included studies. In

AD, the N400 amplitude was consistently reduced in seven out of eight studies. One study comparing individuals with symptomatic AD, presymptomatic AD and familial non-carriers of the E280A presenilin 1 mutation causative of AD, suggested that topographic disruptions in N400 generators precede a decrease in N400 amplitude and clinical symptom onset.

Similarly, PPA patients exhibited significant alterations in the N400 effect to semantic violations compared to healthy controls. More specifically, N400 responses were hardly detectable in semantic PPA (svPPA), delayed in logopenic (lvPPA), and showed mixed results in nonfluent PPA (nfvPPA). Moreover, alterations in N400 topography showed prominent disturbances in svPPA. Additionally, one paper argued that not only the N400 but also the P600 holds potential for discriminating nfvPPA from lvPPA. Likewise, another study stated that combining the N400 and P600 increases diagnostic accuracy in mild AD.

In conclusion, our review supports the diagnostic and potential differential diagnostic value of electrophysiological markers, and in particular the N400. Nonetheless, alterations in this component were not limited to PPA and AD, but were also observed in healthy elderly controls in all three studies including younger and older healthy controls. Therefore, further comprehensive research should include larger study populations, direct comparisons between neurodegenerative diseases, as well as healthy controls of various ages, as effects of ageing and interindividual differences complicate interpretation. Additionally, standardization of used paradigms, stimuli, modalities and outcome measures could increase the value of reported results.

Title: A Systematic Review: Idiom Comprehension in Alzheimer's Disease: the Role of the Executive Functions

Researcher(s): Anastasia Lada¹, Philippe Paquier^{1,2,3}, Christina Manouilidou⁴, Simone Sprenger⁵, Stefanie Keulen¹

Affiliation: ¹Vrije Universiteit Brussel, ²Université Libre de Bruxelles, ³Universiteit Antwerpen, ⁴University of Ljubljana & ⁵University of Groningen

Introduction & Aims: Recent studies on people with Alzheimer's disease (AD) showed that more than one third of the people who ultimately had pathologically confirmed AD began with deficits in cognitive abilities other than those typically thought of as episodic memory (Storandt, 2008). Specifically, early difficulties in executive functions (EFs) have been linked to early AD. There are three core EFs (Miyake et al., 2000): (a) inhibition, (b) shifting, and (c) updating. Inhibition refers to the ability to suppress automatically activated information. Shifting refers to swapping back and forth between tasks or mental states. Updating refers to "monitoring and coding of incoming information for relevance to the task at hand", while re-organizing the information in working memory (Coemans et al., 2022, p. 305).

EFs are essential for many aspects of daily life, such as planning, decision-making, and problem-solving (Bialystok, 2008). In addition, EFs are thought to be essential for comprehending figurative language, and more specifically idioms. Idioms are classified as expressions that convey a non-literal meaning which cannot always derive from the meanings of their constituent words (Titone & Connine, 1994). From a semantic standpoint, idioms can vary in terms of their degree of frequency (low/high), familiarity (familiar/unfamiliar), ambiguity (ambiguous/unambiguous), transparency (transparent/opaque), and decomposability (decomposable/non-decomposable). Idiom comprehension tasks can be an indicator of early changes in the EFs of patients with AD. However, not all studies agree on whether idioms are impaired in AD and consequently, it may be the case that not all of them heavily rely on EFs. Such controversial results may

occur due to the different inherent semantic characteristics in idiomatic expressions, as well as the methodological approaches followed across studies. These aspects may be the cause of heterogeneous results regarding impaired comprehension patterns.

In this study, we seek to answer to the following questions. (1) Is idiom comprehension impaired in AD? And if so, is it linked to specific lexico- semantic dimensions/characteristics? (2) Is patients' performance linked with their performance in (all) EFs?

Methods: A systematic review was conducted following the PRISMA approach. Starting from an initial find of n=590 articles, after removing duplicates (n=290) and applying inclusion and exclusion criteria, 11 articles were retained for further analysis. For the systematic review, relevant information that was extracted included differences and similarities across studies, especially focusing on the type of stimuli employed (idiom internal characteristics), the type of task, as well as language comprehension patterns reported. In addition, data were extracted for: MMSE scores, EF scores, or score for other psychometric tests employed (e.g., memory, language, visuospatial assessments).

Results: The systematic search indicated that idioms are impaired in patients with AD in 9 out of 11 studies. The inherent semantic characteristics of idioms affect the level of comprehension in patients suffering from AD. Although the dimensions characterizing the stimuli showed great heterogeneity and many times were inadequately described, patients with AD performed better in the presence of opaque idioms and worse in presence of ambiguous idioms irrespective of their decomposability or transparency. Executive function testing is not conducted in all studies. However, patients with AD seem to be sensitive to interference as indicated from their scores in the Stroop test. Therefore, inhibitory control is linked to idiom comprehension and is more prevalent in the presence of ambiguous idioms. For the rest of the executive functions, the evidence is inadequate to establish correlations with idiom comprehension.

Discussion: Patients with AD performed better in light of opaque idioms due to the fact that such idioms do not have strong associations with the literal meaning of the expression and therefore, less interference is present. On the contrary, when patients are presented with ambiguous idioms suppression mechanisms are activated and the role of executive functions is predominant, leading to more impaired comprehension (Demeter, 2009). It is therefore suggested that impairments in patients with AD are not generalized to all idioms but mainly depend on the different characteristics they bear and subsequently the different cognitive mechanisms they tap onto. However, in many cases, inadequate information regarding the stimuli's characteristics, the inclusion of only accuracy measurements and small sample sizes make disentangling the comprehension patterns a rather difficult task. Importantly, the interaction of idiom characteristics is not considered in any of the studies. Lastly, executive functioning seems necessary for successful idiom comprehension but is more prominent when patients have to process ambiguous idioms. However, the literature does not provide sufficient data and a link between different idiom dimensions (and their interplay) and specific aspects of executive functioning cannot be drawn.

Title: Mini-Linguistic State Examination (MLSE): Preliminary Findings in Primary Apraxia of Speech (PAOS)

Researcher(s): Rosie Coppieters¹, Lize Jiskoot^{2,3} & Rose Bruffaerts^{1,4}

Affiliation: ¹Universiteit Antwerpen, ²UCL Queen Square Institute of Neurology & ³Antwerp University Hospital

Frontotemporal degeneration (FTD) is a group of debilitating neurodegenerative diseases with cognitive deficits. While Alzheimer's Disease is the most frequent cause,

frontotemporal degeneration (FTD) is considered to be the second most common cause of early-onset dementia (before the age of 65). Changes in speech and language occur as some of the first symptoms FTD. The Mini-Linguistic State Examination (MLSE) (Patel, 2022) is a short, intuitive, and easy to use, speech and language test that was first developed in English patients with Primary Progressive Aphasia (PPA), a form of FTD where speech or language are the primary deficits. The MLSE is composed of sub scores in different domains (motor speech, phonological structure, semantic knowledge, syntax, and working memory) as well as a total overall score. We have translated the MLSE into Dutch and aim to validate the new version. Preliminary findings in 6 patients with Primary Apraxia of Speech (3 with the non-fluent variant of PPA and 3 with Primary Progressive Apraxia of Speech) (mean age: 70) and 81 healthy volunteers (mean age: 68) show that the motor speech domain (control avg: 99%, std: 1.55; patient avg: 49%, std: 44.8), as well as overall scores (control avg: 97, std: 1.7; patient avg: 72, std: 21.9), offer the most promise for differentiating PAOS from controls and other variants of FTD.

D1R2S2: Production 1

Title: **Chinese Verbal Classifier Processing in Verb-Phrase Naming: An ERP Study**

Researcher(s): Yanan Wang¹, Christian Dobel² & Niels O. Schiller^{1,3}

Affiliation: ¹Leiden University, ²Jena University Hospital, ³City University of Hong Kong

Current models of language production debate on whether syntactic features mediate between semantic and phonological access. This study focused on the lexical selection stage in speech production, investigating the retrieval of Chinese verbal classifiers, an under-researched topic despite its lexico-syntactic resemblance to nominal classifiers (Tian, 2014). Three research questions were addressed: i) Do traceable effects exist for classifier congruency and semantic interference? ii) Do incongruent/unrelated trials induce an N400 effect? iii) As a lexical-syntactic feature, how are verbal classifiers activated and selected during speech production? We employed a 2x2 design with classifier congruency (congruent vs. incongruent) and semantic relatedness (related vs. unrelated) as factors. Forty-one Mandarin native speakers participated in a verbal classifier phrase naming task using the PWI paradigm. Behavioral and EEG data from 33 participants underwent analysis. As a result, behavioral data showed a significant semantic interference effect in naming latency and a classifier congruency effect in naming accuracy. Additionally, EEG data revealed more negative amplitudes for classifier incongruent trials than congruent trials, with a topographic distribution of the classifier N400 effect from frontal to parietal regions. Presumably, verbal classifier features were automatically activated, with competitive selection occurring between target and distractor classifiers.

Title: Grammatical gender in Slovak word production: An event-related potential study

Researcher(s): Sarah I. Stolle^{1,2}, Adriana Hanulíková², & Niels O. Schiller^{3,4,5}

Affiliation: Vrije Universiteit Brussel¹, University of Freiburg², ^{3,4}Leiden University, & ⁵City University Hong Kong

During word production, speakers need to retrieve relevant lexico-syntactic features like grammatical gender. It is still unclear, however, whether grammatical gender is automatically activated during language production and whether its selection can be bypassed if it is not needed for the upcoming speech output (see Wang & Schiller, 2019 for a review). To add novel evidence to this debate, we conducted a picture-word interference task during which Slovak speakers named pictures while ignoring a gender-congruent or incongruent distractor word. Naming latencies and the electroencephalogram of participants were recorded. As predicted, naming latencies did not differ between conditions, while the gender-incongruent condition evoked larger voltage amplitudes on the electrophysiological level. Unexpectedly, we did not observe an N400 but rather a P300 like effect in the EEG data that was modulated by gender congruency. The results suggest that grammatical gender is always activated during Slovak speech production but that its selection can be bypassed when gender information is not required for the upcoming utterance.

Title: Who is a fluent speaker? Working memory might tell!

Researcher(s): Franziska M. Schulz¹, Ruth E. Corps¹ & Antje S. Meyer^{1,2}

Affiliation: ¹Max Planck Institute for Psycholinguistics & ²Radboud University

Spontaneous speech is often disfluent, containing silent or filled pauses. Previous studies have largely focused on language-based factors (e.g. word frequency) that cause planning difficulty and affect speech fluency. But some speakers are more disfluent than others, suggesting cognitive skills (speaker-based factors) also play a role. Speech planning strongly relies on working memory (WM): Speakers must remember what they want to say. We investigated how WM load and individual differences in WM capacity affect speech fluency, and how speaker- and language-based factors contribute to fluency. We used a network description task, in which participants named six-picture networks. We manipulated planning difficulty by having participants name pictures with high- or low-frequency names. We manipulated WM load by having participants describe the network while it remained on screen (low load) or after it disappeared (high load). Data collection is in progress, but we expect higher disfluency rates when WM load is high and participants name from memory. We also expect more disfluencies when networks contain low-frequency pictures. These results provide insight into the influence of working memory on speech planning and fluency.

Title: The representation of Mandarin Chinese noun-noun compounds in language production

Researcher(s): Yaqian Wang¹, Antje Lorenz^{2,3} & Niels O. Schiller^{1,4}

Affiliation: ¹Leiden University, ²Humboldt-Universität zu Berlin, ³Hochschule Fresenius & ⁴City University of Hong Kong

This study investigated how nominal compounds and their syntactic properties are stored and accessed in speech production. Participants' naming latencies and electrophysiological responses were analyzed to investigate the classifier congruency effect (Wang, Chen, & Schiller, 2019; Huang & Schiller, 2021) in three conditions: (a) morpheme congruent, (b) compound congruent, and (c) unrelated control. In the behavioral data, a significant facilitation effect was observed in the compound congruent condition when compared to the unrelated control condition, while no discernible effect was found in morpheme congruent condition. Electrophysiological

data showed a distinct P600 effect emerging in the unrelated control condition compared to the two related conditions, i.e., morpheme and compound congruent. However, within the P600 time window, both compound and morpheme congruent conditions exhibited similar patterns without significant differences. Considering current models of compound production, the data are best explained by a multiple lemma representation account (e.g., Marelli, Aggujaro, Molteni, & Luzzatti, 2012; Sprenger, Levelt, & Kempen, 2006). This suggests that in Mandarin Chinese, the constituent morphemes of compounds are stored independently at the lemma level during the production process.

D1R2S3: Comprehension/ Tools

Title: Effects of Relatedness between Speech Planning and Comprehension Content on Attentional Distribution - Rapid Invisible Frequency Tagging (RIFT) study

Researcher(s): Cecília Hustá¹, Antje Meyer^{1,2}, Linda Drijvers^{1,2}

Affiliation: ¹Max Planck Institute for Psycholinguistics & ²Radboud University

In conversation, speakers often use the semantics of the comprehended message to inform the semantics of the planned message. Do interlocutors integrate these two messages? In this EEG study, we used rapid invisible frequency tagging, a method that modulates the luminance of visual stimuli or the amplitude of auditory stimuli, together with a picture-word interference paradigm. In this paradigm, participants heard distractor nouns tagged at 54Hz presented together with categorically related or unrelated target pictures tagged at 68Hz. The tagging elicits potentials, which reflect attentional allocation to the tagged stimuli (Drijvers et al., 2021). Our results showed power increases at 54Hz and 68Hz, but no differences between the conditions. Moreover, we observed increased power at 14Hz, resulting from the interaction of the two base frequencies (e.g. $f_2 - f_1$). This power increase was larger in the unrelated than the related condition, indicating that there is more interaction of the auditory and visual stimuli when they are unrelated. These results demonstrate that participants do not have more difficulties visually attending to the related pictures or inhibiting the related auditory distractors, but that they might be trying to prevent integration of the auditory and visual stimuli in the related condition.

Title: Developing the Individual Differences in Language Skills (IDLaS-DE) Test Battery–A new tool for German

Researcher(s): Sandra Bethke¹, Antje S. Meyer^{1,2} & Florian Hintz^{1,3}

Affiliation: ¹Max Planck Institute for Psycholinguistics, ²Radboud University & ³Philipps University of Marburg

Individuals differ greatly in their ability to use language. While language users readily accept this fact, psycholinguistics has only recently begun to systematically examine this variability. To contribute to this growing field of research and move beyond some of its limitations, our lab developed the Individual Differences in Language Skills (IDLaS) Test Battery – an online battery of behavioral tests measuring (1) linguistic knowledge, (2) linguistic processing skills, and (3) general-cognitive skills implicated in linguistic processing for adult speakers of Dutch. This battery has been normed in a large number of individuals and is available to the research community.

To facilitate work on individual differences in other languages, we are currently validating a German version of this test battery. We describe its overall structure, the results of five pilot studies, and the ongoing validation of this new tool in a large sample

of young adult speakers of German. We also introduce our plans of using IDLaS-DE to explore individual differences in language processing more closely.

Title: Identifying neural networks involved in phoneme categorization through EEG source imaging and functional connectivity analysis

Researcher(s): Emma Depuydt^{1*}, Yana Criel^{2*}, Miet De Letter², Pieter van Mierlo¹

Affiliation: ¹MEDISIP, Ghent University & ²BrainComm, Ghent University

*Shared first authorship

Language processing is a complex task that relies on intricate interactions within neural networks. In this study, we investigated the networks involved in phoneme categorization in healthy individuals. Participants were presented with an attentive auditory oddball paradigm containing a phoneme contrast, eliciting a P300 response, while recording high-density EEG. Source reconstruction of the P300 was performed using eLORETA. Both hemispheres were divided into 34 regions of interest (ROIs), and functional networks were calculated as the maximal cross-correlation between ROI-pairs. The network-based statistics approach was used to identify significant differences between the networks obtained for standard and deviant conditions. Processing of the deviant stimuli was supported by stronger interhemispheric connections between parietal and respectively cingulate, temporal, and occipital regions, and by intrahemispheric connections between parietal and temporal regions. Processing of the standard stimuli showed stronger intrahemispheric connections within the left frontal and the right temporal regions. As similar networks are found in literature for other tasks, these results indicate that the elicited P300 might be related to domain-general cognitive processes, such as allocation of attention, rather than domain-specific phoneme processing.

Title: Planning strategies in grammatical encoding: Behavioural and electrophysiological evidence from sentence production

Researcher(s): Qi Zhang¹, Niels O. Schiller^{1,2} & Christian Döbel³

Affiliation: ¹Leiden University, ²City University of Hong Kong & ³Friedrich Schiller University Jena

Introduction: Given the discrepancies in the scope of grammatical encoding during sentence production, there has been a recent shift: a growing consensus among researchers suggests that the unit of grammatical encoding is relatively flexible [3;6;10], influenced by both linguistic [5;4] and non-linguistic factors [1;7]. The current study investigated whether there is a consistent planning unit—be it a word, a phrase, or a clause—or if there is variability, with speakers adopting different strategies depending on the production task, with a focus on how speakers plan sentences in the face of varying syntactic structures and lexico-syntactic elements of the target sentences. Notably, in Mandarin Chinese, a classifier is compulsory between an article, a quantifier, another modifier, and the noun. The choice of classifier is determined by semantic-syntactic features [8]. The lexico-syntactic feature was thought to be activated but not selected in bare noun naming [9]. In the current experiment, potential classifiers of the first two nouns in target sentences were manipulated to be congruent or incongruent.

Method: We conducted a sentence production experiment involving native Chinese speakers (n=30). Participants were presented with displays of three objects in distinct horizontal positions and prompted to produce sentences in Mandarin Chinese of the format "A 在 B 和 C 上边/下边" (The A is above/below the B and the C) or "A 和 B 在 C 上边/下边" (The A and the B are above/below the C). The experiment adopted a two-by-two factorial within-subject design, with the structure of the target sentences and the classifier congruency of N1 and N2 in the sentences as two variables. The production latencies and electrophysiological data were measured and subsequently analysed. The

generalised linear mixed model (GLMM) was adopted in R to analyse the behavioural data. After the EEG data preprocessing, a permutation test and an overall ANOVA to detect the regions of interest and potential time window, a linear mixed effects model (LMM) was used in R to analyse the EEG data.

Results: The results indicated a main effect of target sentences' syntactic structure for the production latencies: sentences starting with a single noun in the subject position had significantly longer latencies than those initiated with a conjunction noun phrase ($p < .05$). Regarding the EEG results, a main effect of syntactic structure and an interaction between the syntactic structure and the classifier congruency were found. First, a stronger P300 effect ($p < .05$) was found in the posterior region when the beginning of the target sentence was a single noun: a more positive ERP wave was observed for the single-noun condition compared to the conjunction-noun-phrase condition in the 350-550 ms time window. The P3b component is often taken to reflect cognitive load: higher voltage amplitudes are elicited in the cognitively more demanding conditions. Second, the classifier congruency affected the difference in the voltage amplitude caused by syntactic structure ($p < .05$).

Discussion: The result suggests that participants approached the two sentence types with distinct planning strategies: they chose to complete varying amounts of grammatical encoding before speech onset, depending on the target sentence's syntactic structure. The EEG result mirrors the behavioural findings, indicating that the different planning strategies led to varying complexity and cognitive load. We proposed that the results indicated a phrase length effect in sentence production. We then discussed two possible sources of information, which the speakers were sensitive to and used to adopt different planning strategies: visual encoding or syntactic processing. The conditions that might trigger the reversed phrase length effect in grammatical encoding were also explored: the time pressure for production and the differences in the locality position between English and Mandarin Chinese were highlighted. Additionally, the effect of the classifier lexico-syntactic feature was discussed.

Conclusion: Our study suggested that speakers tend to plan target sentences with different syntactic structures using distinct planning strategies. The unit of grammatical encoding is relatively flexible, which could be affected by relevant linguistic factors. Our results also suggest that the activation of syntactic features is also task dependent.

D2R1S1: Word processing

Title: **Stacking Chinese characters: Insights from computational modelling**

Researcher(s): Cheng-Yu Hsieh¹, Marco Marelli^{2,3} & Kathleen Rastle¹

Affiliation: ¹University of London, ²University of Milano-Bicocca & ³Milan Center for Neuroscience

Readers of Chinese, a writing system productive in compounding, encounter a mixture of existing and novel compounds on a daily basis. Skilled readers demonstrate proficiency in comprehending texts of this nature may be attributed to their ability of constructing meaning on the fly by combining meanings of constituent characters for both existing and novel compounds. To systematically test this hypothesis, the present study used computational models based on distributed semantics where the character meaning was transformed based on the position where it occurs, prior to semantic composition. This model was validated across three different behavioural measures: sensibility ratings of novel words, lexical decision latencies of rejecting novel words, and lexical decision latencies of recognising real words. The successful implementation of our model suggests that the processing of both familiar and unfamiliar compounds routinely involved a compositional process in which characters are transformed from independent entities to position-specific compound constituents. The model also

suggests that readers can learn to compose character meanings from their experience with compound words.

Title: Bilingual word recognition: investigating source and item memory in Spanish-English speakers

Researcher(s): Rachel Lemaitre, Elena Markantonakis & Kristin Lemhöfer

Affiliation: Radboud University

Memory research shows that prior knowledge shapes our memory traces. For example, Bellana et al. (2021) showed that familiar items enhance item recognition and encoding contextual details, while reducing item memory precision. Conversely, low-frequency words are better recognized than high-frequency words (Mandler et al., 1982). We examined how language proficiency (L1 vs. L2) influences memory detail. Participants studied Spanish and English words paired with color frames. During recognition, they identified repeated and new words, recalling the associated color for repeated ones. New words were either synonyms of encoded words, or entirely novel. Results revealed lower L1 recognition accuracy, more false alarms for synonyms, and no differences in source memory. These findings contribute to understanding the role of language proficiency in memory processing.

Title: Interoceptive grounding of Social and Emotion concepts: an rTMS study

Researcher(s): Martina Mancano, Jesse Sagoe & Costanza Papagno

Affiliation: University of Trento

According to embodied cognition, abstract concepts are perceptually grounded in Interoception, which is supported by Anterior Insula (AI). In this rTMS study, we investigated the role of the left and right AI in cardiac interoception and semantic processing of three categories of concepts: Social and Emotion concepts for the abstract domain, Objects for the concrete domain. Semantic ratings were also collected for all abstract concepts on emotion and social dimensions. TMS conditions and E-field AI ROI analyses showed that right AI stimulation significantly interfered with both cardiac interoception and processing of abstract concepts higher in the emotion and social dimensions. Cardiac interoception and semantic results confirmed the role of the right AI in interoceptive awareness and socio-emotional processing, respectively, in line with an embodied view of abstract concepts, whereby abstract concepts engage areas representing the corresponding experiential modality. Taken together, these results suggest that interoceptive and semantic processes converge on the right AI, where we hypothesise that interoceptive states inform semantic decisions providing a perceptually grounded representation of emotional and social concepts.

Title: Number in Mandarin Chinese: Behavioral and electrophysiological evidence regarding their activation and selection

Researcher(s): Ziheng Cheng¹, Niels O. Schiller^{1,2} & Jenny Doetjes¹

Affiliation: ¹Leiden University & ²City University of Hong Kong

To generate a word, speakers must retrieve lexical information including lexico-syntactic features and encode the phonological form for articulation. Existing studies primarily investigate the word production process of singular and plural nouns, utilizing materials such as phrases or sentences, with a predominant focus on inflectional grammar. This study aims to explore the competitive nature of number feature selection in the context of an exceptionally simple morphological structure. In Mandarin Chinese,

objects are commonly produced using the combination of numeral + classifier + noun phrase to denote quantity. To delve into the role of number in noun phrase production, we employ the picture-word interference (PWI) paradigm to measure participants' naming latencies and record electroencephalography (EEG) data across four conditions, manipulating semantic relatedness and number congruency. Results reveal that, in noun phrase production, naming latencies are significantly prolonged in the semantically related condition compared to the unrelated condition. However, no significant difference emerges between number congruent and incongruent conditions, indicating that lexico-syntactic feature selection is not a determining factor in noun phrase naming. Additionally, an N400-like effect is observed, the semantically unrelated condition yields more negative deflections of the waveform compared to the semantically related condition, though number congruency does not yield an effect in the ERP analyses. Collectively, behavioral and EEG data analyses demonstrate that the selection of number as a lexico-syntactic feature in Mandarin Chinese noun phrase production is not resulting from a competitive process.

D2R1S2: Language switching

Title: The role of phonology in written language switching: can between-language conflict be reduced by down-regulating phonological activation?

Researcher(s): Elena Benini, Andrea M. Philipp & Tanja C. Roembke

Affiliation: RWTH Aachen University

Understanding the interplay between phonology and orthography in bilingual language production is essential to infer the mechanisms underlying language control. In this study, we tested whether the phonology of the conflicting, non-target language can be shielded in written language switching, thus reducing switch costs. German-English bilinguals named pictures of homographs (e.g., ROSE [German/English]) and quasi-homographs (e.g., NOSE/NASE) in their dominant or secondary language. The selected word pairs had identical or almost identical orthography but conflicting phonology in German and English. Participants responded by typing the word, and simultaneously spoke the same word in the corresponding language (type-and-speak), tapped their tongue (type-and-tongue-tap) or did neither (type-only). As predicted, we found larger language-switch costs in the type-and-speak condition than in both the type-only and type-and-tongue-tap conditions, suggesting that the conflicting phonology was more active in the type-and-speak condition compared to the other conditions. We propose that people can regulate the contribution of phonology when typing based on the conditions, partially mitigating between-language competition.

Title: Grammar in Bilinguals: Parallel activation or switching between grammars?

Researcher(s): Annalisa Arcidiacono

Affiliation: University of Bergen

It is sometimes suggested (Hartsuiker & Bernolet, 2017; Hartsuiker, Pickering & Veltkamp, 2004; Hernandez, Fernandez & Aznar-Bese, 2009; Highby et al., 2015) that grammars run in parallel in bilinguals. However, could it be that lexical items are activated across languages while grammar structure is active for one language at a time? Do grammar structures switch while lexical items are available across languages? Can we track lexical and grammatical processes and their interaction experimentally through eye-tracking and self-paced reading measures? I investigated the effect of code-switching (CS), to L1 Norwegian and L2 English in V2 word order sentences according to the grammatical maze structure (Foster, 2010) at the point where the V2 requirement needs to be implemented in Norwegian (A), but not in English (B) because of syntactic constraints. According to the predictions, it would mean that from the testing position,

the second segment of the sentence where the VP is presented, the phrase would be more difficult to process due to the code-switching condition and the V2 requirement.

Code Switching:

English to Norwegian (A):

(A) Before eight o'clock [spiser han || han spiser] pannekaker og bacon til frokost.

Norwegian to English (B):

(B) Før klokka åtte [he eats|| eats he] pancakes and bacon for breakfast.

The parser has the job to linearize building structures, and in a CS environment it is difficult to build alternatives at the same time. But it is possible that both mental lexicon and grammar are activated in bilinguals. One possibility is that the parser builds structures regardless of language, but that alternatives are excluded when they break constraints, and the early constraints can come from the mental lexicon. Thus, it seems plausible to say that the parser can be composed of language-independent processes and that there is something about preferences in the parser that can be described in line with Optimality Theory and Triggers: when a fatal constraint is detected it triggers a reparse. For example, in an English context it is fatal to place the subject after the verb, but not in Norwegian (due to V2). As long as the language has the same ranking on the restrictions that are active in the situation, the parser does not need to care about which language the order is in. One hypothesis could be that the parser is language-independent and builds structures in various steps, from activated information from the lexicon, context, and selection via language-specific sets of constraints.

Based on the findings of past research (Schwochow et al., 2021), I hypothesized that the RTs would be faster when the participant would switch from L2 English to L1 Norwegian, because even if their L2 is strong, the L1 is still the dominant language system. Moreover, I also theorized that the sentences that contain both CS and V2 would be even more difficult to process, resulting in a higher RT. My data supported that both CS and V2 had longer reading times compared to a baseline without CS or V2 on the individual conditions. Two baselines were selected to isolate the effect of CS and V2. Significant differences from the baseline were detected, but there were no specific effects of which language it was code-switched to and from, only the general CS and V2 effects. In conclusion, CS did add extra difficulty for reading or deciding on the testing sentences, but the data does not support a significant difference based on the factor of Language. A significant increase in RT was also detected when switching to L1 or L2 due to V2.

I am currently replicating the study using eye-tracking methods to investigate the cognitive processes involved in language processing and the effects of grammatical constraints on sentence processing in bilinguals. Eye-tracking measures the movements of the eyes as they scan text or visual scenes, providing a fine-grained analysis of the cognitive processes involved in language processing (Rayner, 1998). During the experiment, participants will be seated in front of an eye-tracking device and will be instructed to read the sentences on the computer screen at their own pace. The eye-tracking device will record their eye movements as they read the sentences, including the fixation duration, saccade length, and number of fixations per word.

The eye-tracking data will be analyzed using both region-of-interest (ROI) and non-ROI methods. The ROI method involves identifying specific regions of the sentence, such as the code-switched word or phrase, and calculating metrics such as first fixation duration and total viewing time for those regions. The non-ROI method involves analyzing the overall gaze behavior across the entire sentence. The data will be analyzed using mixed-effects models, with fixed effects of condition, position of the code-switching, and type of code-switching, as well as random effects of participant and item.

Title: **Switching languages or speech registers: are similar control processes at play?**

Researcher(s): Noémie Baulande

Affiliation: UT2J (Univeristy of Toulouse)

Until recently, the literature on bilingual lexical access and language control has considered tagging systems as singularities of the multilingual cognition enabling mental representation of language memberships only. However, a recent study lead by Declerck et al. (2020) suggests that tagging systems could also be at work in single language processing for speech register representation and control. To further investigate the eventuality of a register tag and the resulting similarity of single and dual language control mechanisms, we compared language and register processing in: a) a lexical decision task, b) a switched naming task and c) a constrained discourse production task. The study has been led with 63 French-English bilinguals with L2 level ranging from A1 to C2 and used as a continuous variable. Our focus will be on the switched naming task, a variation of Declerck et al. (2020)'s 1st experiment. If their hypothesis is correct, we expect to observe a correlation of the switch costs obtained in language and register switching. Results will be presented and discussed in the light of Declerck et al. (2020)'s conclusions.

Title: Effects of age and sex on cerebral processing of language and task switching

Researcher(s): Oona Cromheecke¹, Evy Woumans¹, Pieter Van Mierlo¹, Marijke Miatton^{1,2}, Arnaud Szmalec^{1,3} & Miet De Letter¹

Affiliation: ¹Ghent University, ²Ghent University Hospital & ³University of Louvain

Bilinguals demonstrate the ability to seamlessly switch between their two languages. This language control (LC) is supposed to arise from shared neurocognitive mechanisms with executive control (EC). However, the extent to which these mechanisms are shared across domains, and whether LC is therefore domain-general or domain-specific, remains debated. Furthermore, it is still unclear how LC manifests in late bilinguals with varying proficiency levels. Eighty healthy adults (40 women and 40 men), equally distributed into a young (20-39 years) and middle-aged (40-59 years) group, participated in this study. Dutch was their native language and English their second. The study investigated the impact of age and sex on the cerebral processing of language and task switching using electroencephalography (EEG). The EEG paradigm comprised a carefully matched language and task switching paradigm, where language switch costs served as an index for LC, and taskswitch costs for EC. Control processes were compared for both cue and stimulus processing. No significant differences between language and task switch costs were found for both cue and stimulus processing. These findings support domain-general LC. In terms of age and sex effects, the middle-aged group showed reduced amplitude and increased latency compared to the young group for cue processing, whereas young men showed increased latency compared to middle-aged men for stimulus processing.

D2R1S3: Production 3

Title: Existing Talker Information May Hinder Convergence in Synchronous Speech

Researcher(s): Orhun Uluşahin¹, Hans Rutger Bosker^{2,1}, Antje S. Meyer¹ & James M. McQueen^{2,1}

Affiliation: ¹Max Planck Institute for Psycholinguistics & ²Donders Institute for Brain, Cognition and Behaviour

Convergence refers to interlocutors' tendency to gradually sound more alike. Synchronous speech paradigms have demonstrated convergence in fundamental frequency (F0). Here, we studied the influence of talker-bound information on F0 convergence. In Experiment 1, two participant groups (i.e., high and low F0; N = 16 each) read 40 sentences to establish their F0 baselines. Then, in a synchronous speech task,

they read 80 sentences at the same time as a model talker whose voice was manipulated 2 semitones (st) above or below (i.e., for the two groups, respectively) a reference F₀ value. Across both groups, 75% of participants converged to the model talker. In Experiment 2, two new groups (N=16 each) performed the same reading task, as well as an exposure task with a pitch-shifted (± 2 st) model talker. Then, they performed a synchronous speech task where the model talker's voice contrasted their knowledge about the talker (e.g., those who were exposed to high F₀ now heard low F₀). In Experiment 2, both the proportion of convergers (56%) and the amount of convergence (in st) were smaller than in Experiment 1. Our results suggest that existing talker information hinders convergence when it contrasts with information in incoming speech.

Title: Framework for modeling the rhythmic organisation of speech and the impact of perceptual cues on production

Researcher(s): Mélen Guillaume^{1,2}, Julien Diard² & Anahita Basirat¹

Affiliation: ¹University of Lille & ²Université Grenoble Alpes

Despite a growing body of evidence about inter-speaker alignment, there is lack of representation of this phenomena in models of speech perception and production. Computational approaches in speech motor control present characteristics that can address some facets of these phenomena (Guenther 2016). An aspect which has received few attention in speech production models is the influence of external stimuli perception on speech production. Typical individuals, but also individuals with Parkinson's disease, entrain to the temporal aspects of others' speech (Späth et al. 2022). However, this transfer from perception to production has not been thoroughly explored. Our objective is to fill this gap by developing probabilistic models taking those effects into account. Our main hypothesis being that there is a fusion of temporal information between a planned speech sequence and the auditory stimuli, this question has already been issued for other aspect of speech (Nabé Schwart & Diard 2021). Two main categories of models will be compared here. This preliminary work will help us enriching already existing models of speech production with new information.

Title: Rhythmic Priming and Speech Production: link between Neural Entrainment and Sensorimotor Synchronization

Researcher(s): Jules Fumel¹, Louison Bompais¹, Laurent Ott¹, Anne Kösem² & Anahita Basirat¹

Affiliation: ¹CNRS, University of Lille & ²Lyon Neuroscience Research Center (CRNL)

Various studies to date have shown the impact of rhythmic priming on language processing. According to the PRISM model (Fiveash et al., 2021), three underlying mechanisms are proposed to explain this impact: precise auditory processing, entrainment of neural oscillations to external stimuli, and sensorimotor coupling that enables a close connection between perception and production. The aim of our study was to assess the impact of auditory rhythm on speech production, and to examine the role of the latter two elements. First, participants listened to regular and irregular rhythms in a rhythmic priming paradigm and produced sentences. EEG and speech data were collected. Then, participants performed several tapping tasks. In the priming task, the degree of coherence between the EEG signal and the envelope of the acoustic signal was established. In sensorimotor tasks, the accuracy and consistency of tapping were calculated. We will present the link between coherence and sensorimotor abilities and discuss whether and how they may shed light on the mechanisms underlying the impact of rhythm on speech and language processing.

Title: How stable are effects of word frequency and name agreement in picture naming? A two-session repetition priming study

Researcher(s): Caitlin Decuyper¹, Ruth E. Corps¹ & Antje S. Meyer^{1,2}

Affiliation: ¹Max Planck Institute for Psycholinguistics & ²Radboud University

Speakers are faster to name (1) pictures with high-frequency (e.g., dog) than low-frequency names (e.g., rhino) and (2) pictures with high (e.g., arm) compared to low name agreement (NA; e.g., sofa, couch; e.g., Alario et al., 2004). An important question is how repetition priming affects these variables. Some theories claim that repeatedly naming a picture should reduce word frequency (WF) and NA effects as low WF and low NA items benefit from repetition more. However, these predictions have rarely been tested and research has not compared (1) whether repetition priming affects WF and NA to a similar extent; and (2) the stability and longevity of changes in WF or NA.

To gain insight into the mechanisms underlying WF and NA effects, we are running a 2-Session study (N=100). In S1, participants name 98 pictures varying in WF and NA three times each. One week later, they name the same old and 98 new items. Repetition should reduce WF and NA effects within S1. If repetition alters a word's accessibility, we expect a WF effect for new, but not old items in S2. The stability of the NA effect in S2 will show whether incremental learning or the use community knowledge over individual preferences of underlies NA (Balatsou et al., 2022).

D2R1S4: Sentence processing

Title: Processing of Visual Shape Information in Chinese Classifier-Noun phrases

Researcher(s): Jin Wang

Affiliation: Leiden University

Previous studies have employed the picture-word interference paradigm to validate that classifiers associated with nouns were activated as lexico-syntactic features during lexical access of Chinese nouns. However, there are many subcategories of classifiers, among which shape classifiers possess a certain degree of specificity due to their inclusion of shape information. This study aimed to investigate the processing of visual shape information of classifiers during the production of classifier-noun phrases by native Chinese speakers. Thirty-six participants engaged in a picture-naming task using the blocked naming paradigm. Thirty-six pictures, comprising eighteen flat objects and eighteen long objects, each associated with a specific shape classifier, were selected as targets. The target pictures were arranged into twelve triplets according to classifier congruency and shape similarity. The triplets with different combination orders formed three experimental conditions: classifier and shape congruent condition (C+S+), classifier incongruent and shape congruent condition (C-S+), and classifier and shape incongruent condition (C-S-). Each triplet was repeated eight times to create a block, and participants were instructed to name the pictures in each block using the format “number + classifier + noun.” Voice responses and EEG data were recorded. Preliminary behavioural results revealed a significant difference in response times between C+S+ and C-S+ conditions, with slower reaction time when classifiers were incongruent within each naming block. A significant difference was observed between C-S+ and C-S- conditions, with slower reaction time when object shapes were similar. EEG results exhibited an N400 effect when comparing C+S+ with C-S+ conditions and C-S+ with C-S- conditions, demonstrating the presence of a shape interference effect. These findings suggested that visual shape information affected noun phrase production.

Title: Syntactic priming as a means of learning a new grammatical construction?

Researcher(s): Lara Baert

Affiliation: Universiteit Antwerpen

The French grammar proficiency of Dutch-speaking seems to decrease among Flemish high school students. We investigated whether they can learn the French passive through syntactic priming (i.e., the tendency to repeat grammatical structures). We set up a between-language (L1-L2) experiment with an intervention of 4 French passive primes with the same verb as the target midway the experiment. 48 Flemish secondary students without prior exposure to the passive construction described pictures (24 items) in French after a Dutch prime, either an active or a passive sentence. Dutch and French use a different auxiliary verb (e.g., “The cook is being carried by the butcher” is *De kok wordt* [“becomes”] *gedragen door de slager* and *Le chef est* [“is”] *porté par le boucher*, respectively). Preliminary results show that there was no passive priming before the intervention, but some students showed passive priming during and after the intervention. However, some students started to use the passive auxiliary verb *être*, but incorrectly (e.g., instead of the past tense auxiliary *avoir*, like *Le boucher est porté le chef*). Still, these results reveal that a lexically-based intervention may serve as a learning tool to develop abstract syntactic representations.

Title: Cross-Linguistic Priming of Ungrammatical Structures: A Study on French-English Bilinguals

Researcher(s): Fahd Amin, Foteini Karkaletsou, Gunnar Jacob & Shanley E.M. Allen

Affiliation: RPTU Kaiserslautern-Landau

This study explores cross-linguistic ungrammatical priming in Canadian French-English bilinguals, focusing on two types of ungrammatical structures in French which are grammatical in English. It also examines whether increasing exposure to the prime across trials enhances priming effects. Using a self-paced reading task, ungrammatical French targets follow English primes. French targets are ditransitives without the dative marker *à* (*Le garçon donne (à) la femme un cadeau* ‘The boy gives the woman a present’) and monotransitives without the obligatory prepositional marking on direct object (*Le garçon joue (de) la guitare* ‘The boy plays the guitar’). English ditransitive primes are either Double Object (*The man gives the woman a present*), Prepositional Object with canonical (*The man gives a present to the woman*) or scrambled word order (*The man gives to the woman a present*). Monotransitive primes are either grammatical (*The student plays basketball*) or ungrammatical (*The student plays to the basketball*). Faster reading times (RTs) are expected for ditransitive targets after Double Object primes, and for monotransitives targets after grammatical primes due to similar structures. Increasing exposure is predicted to decrease RTs.

Title: Examining cross-linguistic ungrammatical priming of reciprocal structures: The impact of dominant language

Researcher(s): Kübra Nur Çetin, Foteini Karkaletsou, Gunnar Jacob & Shanley E.M. Allen

Affiliation: RPTU Kaiserslautern-Landau

This study aims to examine cross-linguistic priming of reciprocal structures that are ungrammatical in French but grammatical in English, with adult bilingual speakers of French and English in Canada. In English, reciprocal constructions typically involve the use of “each other” and can be grammatically correct with or without complementation. However, in French, a reflexive “se” is required. In a self-paced reading task in Gorilla, participants are presented with English prime sentences before encountering ungrammatical French targets. English primes appear in three conditions: grammatical without complementation (*The man and the woman kiss in the park*), grammatical with complementation (*The man and the woman kiss each other in the park*), and ungrammatical with complementation (*The man and the woman each other kiss in the park*). As a target, ungrammatical French sentences are presented where “se” is omitted. In the grammatical condition without complementation, participants are expected to

have faster reading times compared to other two prime conditions. Furthermore, English-dominant participants are expected to demonstrate stronger priming effects than French-dominant participants. Data will be analyzed by the conference date.

D2R2S1: Production 2

Title: Tree for three: the phonological representation of /θ/ in L1 Dutch-L2 English speakers

Researcher(s): Rianne van Lieburg

Affiliation: Universiteit Antwerpen

L2 speakers might develop a distinct phonological representation of novel L2 sounds, even if they merge the sound with another phoneme in production and/or perception [1]. We investigated whether the manner of articulation of /θ/ is specified as [continuant], as in L1 speakers, or as a [stop], conform L2 production. We tested 40 L1 Dutch-L2 English speakers (age 18-35) using the cue- distractor paradigm in a Go/No Go-task [cf. 2]. At each trial (N = 960), participants heard a distractor thick, tick, sick or nick while seeing a cue THICK or TICK. Participants pressed Space when they read THICK (block 1) or TICK (block 2). We compared reaction times between conditions in a linear mixed effects model. For both cues, RTs were slower when the distractor was thick or sick compared to when the distractor was tick or nick. The findings suggest that L2 speakers store /θ/ as an oral stop instead of a continuant.

Title: Interpreting prosody: acoustic analysis and online rating of speech acts and emotions

Researcher(s): Giada Antonicelli

Affiliation: Basque Center on Cognition, Brain and Language (BCBL)

Prosody is a fundamental characteristic of speech and is used to convey emotional and linguistic contents. Intensity- and pitch-related features robustly distinguish among intonation contours (ICs) and are subject to individual and cultural variability [1]. Brain research suggests that emotional and linguistic prosody are quickly told from neutral prosody [2,3] and are partially segregated from each other [4]. We asked: (RQ1) Do linguistic, neutral, and emotional prosody differ acoustically? (RQ2) Does acoustic discriminability reflect in behavior? We extracted pitch standard deviation (SD), pitch slope (Hz/s), mean pitch and envelope SD from 185 sentences uttered in 5 ICs belonging to the three prosody types (925 in total). Pitch slope and envelope SD could reliably distinguish among ICs both within and across prosody categories. 124 subjects rated the stimuli online using labelled-tick sliders. Agreement with our expected ratings significantly depended on the type of IC. These results show that acoustic discriminability does not directly reflect in behavior and support a partial dissociation between sensory processing and the higher-order cognitive functions involved in prosody identification.

Title: Effect of home language on spelling error patterns in primary school children

Researcher(s): Silke Marie Crols, Linda Romanovska, Sonja Ugen & Ineke M. Pit-ten Cate

Affiliation: Université du Luxembourg

Research has demonstrated a relationship between phonological awareness and literacy development. Children that manifest difficulties with phonographemic mapping are more likely to experience delays in literacy development, which may be reflected in the nature of their spelling mistakes. More specifically, these children may be more prone to making phonologically based errors, as opposed to orthographic ones. Another line of research has focused on the relationship between phonological awareness and

bilingualism, whereby the phonology of 1st language may affect spelling error patterns in the other.

This study assesses the impact of home language on spelling error patterns in Luxembourg, where most children acquire literacy skills in German, even though for many, this is not their main language spoken at home. A representative sample of 691 children (aged 8 - 11 years) completed a sentence writing task. Possible differences in error types between language groups will be analyzed.

Title: When should we ask? The role of linguistic input in the acquisition of questions

Researcher(s): Isabella Vornehm, Anne Steendam & Raquel G. Alhama

Affiliation: N/A

The formation of questions in English requires understanding complex syntactic rules, such as subject-auxiliary inversion and wh-movement. Our study investigates the role of linguistic input in children's learning of question formation; in particular, we use the Manchester corpus to track productions of Yes/No questions (involving subject-auxiliary inversion) and Wh-questions (involving both subject-auxiliary inversion and wh-movement) in parental and children speech. We observe a gradual developmental trajectory in children's productions of questions with syntactic movement. As expected, exposure to parents' use of Yes/No questions is positively correlated with children's productions of such questions; however, the opposite is the case for Wh-questions, suggesting that introducing overly complex structures too early may hinder rather than help learning.

D2R2S2: Aphasia

Title: A comparison of cerebellar tDCS effects in non-fluent PPA and post-stroke aphasia

Researcher(s): Silke Coemans, Vânia De Aguiar, Philippe Paquier, Kyrana Tsapkini, Dorien Vandendorpe, Sebastiaan Engelborghs, Esli Struys & Stefanie Keulen

Affiliation: Vrije Universiteit Brussel

Introduction and aims

tDCS is a promising neuromodulation tool that has been found to increase efficiency of speech and language therapy in patients suffering from Primary Progressive Aphasia (PPA) and post-stroke aphasia. However, the search for (an) optimal stimulation site(s) is ongoing, and targets of tDCS stimulation have mainly been limited to one cortical area, usually the left hemisphere language areas, and right hemisphere language homologs. Limiting stimulation to cortical language areas might conceal the importance of other valuable network components. Investigating alternative targets for neuromodulation is imperative. Further, while an increasing number of patients speak multiple languages, no research has been published on the use of tDCS in bilingual aphasia. We here illustrate and compare the potential usefulness of targeting the right cerebellum in a bilingual patient with non-fluent PPA to a patient with non-fluent post-stroke aphasia.

The cerebellum is a strong candidate location for tDCS in bilingual patients, because of its anatomical connections with left hemisphere language areas, and the role it plays in language function, executive function, (bilingual) language control and cognition. Anodal stimulation of the inhibitory Purkinje cells of the cerebellum leads to increased inhibitory effects on the basal ganglia and contralateral cortical prefrontal regions. This leads to disinhibition of basal ganglia output, increasing stimulation of the array of cortical regions reached by the basal ganglia and cerebellum: the prefrontal, temporal, posterior parietal, oculomotor and premotor cortex. In monolinguals post-stroke aphasia, three studies so far have found cerebellar tDCS to lead to positive results on language improvement. Our research group has recently published a case-study of the

post-stroke patient included in this proposal. Our aim now is to compare the effects of cerebellar tDCS stimulation applied to the right cerebellum in non-fluent post-stroke aphasia to non-fluent PPA, by looking at language outcomes in the treated language (language of therapy) and non-treated language, and the executive functions circuit.

Methods

Participants: We present a comparison of a patient with non-fluent post-stroke aphasia and non-fluent PPA. Both are bilinguals in French (L1) and Dutch (L2). The individual with post-stroke aphasia was a right-handed 73-year-old male who experienced a left-hemisphere stroke 27 months before entering the study. His performance was mainly impaired on naming tasks, verbal fluency and sentence comprehension. The individual with non-fluent PPA was a 57-year old male diagnosed one year prior to inclusion in the study. His main symptoms were word-finding difficulties and phonological errors in speech.

Language outcomes: The outcome measures were change in oral naming accuracy for trained and untrained picture exemplars (Boston Naming Test), tested prior to the start of the treatment, end of treatment, and 2 months post-treatment. Stimuli of both measures were matched for lexical frequency, concreteness and number of syllables. Secondary language outcomes measures were performance on subtests of the Bilingual Aphasia Test, verbal fluency, and two tests for inhibitory control: the Attention Network Test and Stroop Test. Language training was provided in the language requested by the participants, which for both was L2 (Dutch). *tDCS:* We used a double-blind, within-subject crossover trial design, with two experimental conditions: “right cerebellar tDCS + speech and language treatment” and “sham tDCS + speech and language treatment”. Each condition consisted of 9 consecutive training sessions, 3 per week over 3 weeks, separated by 2 months. tDCS was delivered at a constant current of 2mA, administered for the first 20 min of speech and language treatment session. The anode was centered on the right cerebellum, 1 cm under, and 4 cm lateral to theinion, and the cathode was placed on the righted deltoid muscle. Sham tDCS was applied using the same electrode configuration, but current intensity was ramped down to zero after 30 s. Contralateral stimulation is applied due to the fact that in the brain, most cerebro-cerebellar connections are crossed.

Results

A comparison is made in changes from baseline after real and sham tDCS. For each treatment condition (sham and tDCS), we compared the performance 1) pre-treatment and immediately after treatment, (2) pre-treatment and 2 months post-treatment on each stimulus type. For the post-stroke patient, both sham and anodal treatment improved trained picture naming in the treated language (L2), while anodal tDCS in addition improved picture naming of untrained items in L2 and his first language, L1. Picture description improved in L2 and L1 after anodal tDCS, but not after sham. For the patient with PPA, after anodal tDCS, but not after sham, results improved significantly on oral naming in L2, with generalization to untrained tasks and cross-language transfer to L1: picture naming in both languages, syntactic comprehension and repetition in L2, and response times in the incongruent condition of the Attention Network Test, indicating increased inhibitory control.

Discussion and conclusions

TDCS is a promising tool for neuromodulation to enhance effects of speech and language therapy of aphasia, however, an optimal stimulation site has yet to be identified. Further, tDCS research in bilingual aphasia is scarce, but necessary, as bilingualism is more and more common in today's world. In these two case-studies, we show how stimulation of the right posterolateral cerebellum combined with speech and language treatment can improve treated and untreated items, and can lead to cross-linguistic therapy effect in non-fluent post-stroke aphasia, and PPA. We discuss how these effects may be mediated by the role of the cerebellum in language. Targeting the

intact right cerebellum, an area involved in language and (bilingual) language control, allows for the possibility of targeting a single region that may possibly be used across different types of aphasic patients, with varying lesion sites and sizes, often occurring in the left hemisphere.

Title: Agrammatism in Turkish: Eye Tracking Evidence of Morpheme Selection Impairment in Primary Progressive Aphasia

Researcher(s): Mustafa Seckin¹, İlayda Demir², Merve Savaş³, Hakan Gürvit¹

Affiliation: ¹Istanbul University, ²Aziz Sancar Institute of Experimental Medicine & ³Atlas University

Background/Objective: Turkish is an agglutinative language. Therefore, assessment of inflectional morphology impairment in Turkish can be more reliable for understanding agrammatism compared to the assessment of word order/syntax.

Design/Methods: We used a remote eye tracker to measure eye movement patterns during a sentence-completion paradigm. Eighteen verb-object pairs with strong semantic association were chosen to create sentence cues in the form of "SUBJECT + OBJECT + TIME ADVERB + [GAP]". Nine agrammatic primary progressive aphasia (PPA) patients and 12 controls were presented with an incomplete sentence cue followed by a visual array of 6 written words (one target and 5 distractors) on a touch screen. Participants were asked to read the sentence cue and point to the word that best completes the given sentence. The target verb on the visual array was semantically associated with the object in the sentence cue and inflected with the tense marking that was congruent with the time adverb (V+T+). Two of the distractor verbs (V+T-distractors) had the same stem (free morpheme) as the target but were presented with a progressive aspect or a different tense marking (bound morphemes). Remaining 3 distractors (V- verbs) had different verb stems (one with a congruent and the remaining two with incongruent tense markings).

Results: Controls pointed to the correct verb in 98% of the trials and spent greater time looking at the target (47% of total viewing time) and did not view any of the distractor verbs more than chance level of 16.6%. PPA patients spent less time (24.3%) viewing the target and were distracted by V+ distractors more than V- distractors regardless of the tense markings and only the V+ distractors were viewed greater than by chance.

Conclusion: Morpheme selection was impaired in agrammatic PPA patients and the competition between free morphemes was more pronounced compared to the competition between bound morphemes.

Title: Latent cluster analysis to capture language profiles in the acute phase post-stroke

Researcher(s): Mara Barberis¹, Klara Schevenels¹, Robin Lemmens², Maaïke Vandermosten¹

Affiliation: ¹KU Leuven & ²University Hospitals Leuven

Diagnosing language deficits (aphasia) in the acute phase post-stroke can be challenging due to suboptimal language screenings or co-occurring post-stroke comorbidities such as visual or cognitive impairments. In this study, we therefore investigate whether a data-driven approach can provide additional insight in post-stroke language profiles. Behavioural data from language and cognitive screening, stroke type and severity, lesion location and demographic data were collected in 452 stroke survivors. Participants were grouped in acute language profiles using latent cluster analysis, which accounts for interdependence among different observed variables in a person-centered way. Five acute language profiles can be distinguished: (1) no language deficit, (2) mild language deficit, (3) severe language deficit, (4) productive language deficit and (5) comorbid language deficit. From language screening scores only, differential diagnosis between

severe and comorbid language deficits could not always be made. However, our data driven approach showed that in acute stroke, detection of apparent language difficulties was confounded with high age, history of stroke or visual or cognitive deficits. An automatic integration of post-stroke symptoms and comorbidities, as well as medical history is thus of uttermost importance to provide optimal referral for language intervention.

Title: Persistent language network functional connectivity alterations in the individuals recovering from a brain injury acquired during childhood versus acquired during adulthood

Researcher(s): Yana Criel¹, Emma Depuydt¹, Manon De Raeve¹, Elissa-Marie Cocquyt¹, Jara Stalpaert¹, Evelien De Groote¹, Elien De Cock^{1,2}, Katja Batens², Veerle De Herdt^{1,2}, Kristine Oostra^{1,2}, Nele Raman², Nathalie Haekens², Barbara De Clercq¹, Marijke Miatton^{1,2}, Patrick Santens^{1,2}, Pieter van Mierlo¹ & Miet De Letter¹

Affiliation: ¹Gent University & ²Gent University Hospital

Aim: Reorganization of functional language networks in adults recovering from a childhood acquired brain injury (cABI) is thought to proceed differently from adult acquired aphasia recovery (aABI). We studied the networks underlying phoneme perception and semantic word retrieval in both adult groups.

Methods: Task-dependent EEG was recorded in seven adults with a cABI and nine persons with an aABI, as well as matched control groups for each experimental cohort. A passive and active phonemic oddball task, and a semantic priming task were administered. EEG data were compared between the experimental groups and their respective control groups in terms of scalp-level functional connectivity and network topology.

Results: Functional network components showing significant difference between the experimental and control group were identified in both the cABI (3 significant components) and aABI group (9 significant components). In aABI, the alterations in the phoneme perception and semantic retrieval networks translated to reduced global network integration, reduced network modularity, and persistent functional language impairments. In the cABI group, normal-like network topology was observed.

Conclusion: While both adults with a cABI and aABI show long-term alterations in the organization of functional language networks, cABI might be associated with superior capacities in terms of restoring a normal-like network topology.

D1R2S3: Learning & education

Title: Towards a Quantifiable Measure of Orthographic Congruency Between 2 Languages

Researcher(s): Ding Yan, Séverine Casalis & Paolo Mairano

Affiliation: University of Lille

Whereas the advantage of having orthographic information available during vocabulary acquisition has been consistently observed in a L1 learning context, studies are inconclusive about how this orthographic facilitation effect extends to the acquisition of L2 vocabulary. A discrepancy that is due to the language specific nature of grapheme-to-phoneme correspondences (GPC). Indeed, recent studies suggest that if L1 and L2 GPCs are incongruent, the resulting interference impacts the integration of novel lexical representations.

The dominant approach for determining congruency in the literature consists in a subjective speaker-based evaluation; non-native L2 pronunciations are deemed sufficiently native-like or not by L2 proficient examiners. Although yielding results, the lack of an objective method denotes the necessity for a quantifiable measure of congruency. Using infralexicial statistics, we have established a framework for calculating the degree of L1-L2 GPC congruency. Placing non-native L2 pronunciations on a percentage based continuum of congruency. The further inclusion of behavioral data allows us to account for both theory and praxis in order to thoroughly measure the degree of orthographic congruency between two languages.

Title: In search of the mechanisms of word learning: Understanding the pathway from configuration to engagement

Researcher(s): Junior Vargas

Affiliation: University of Lille

Following the differentiation between lexical configuration, the formal knowledge of a word, and lexical engagement, the integration of a word into the lexical system (Leach & Samuel, 2007), we studied which formal feature (phonology or orthography) of a word allows for a better apprehension of its semantic representation during learning. When a word is integrated in the lexicon, it has been proved to interact with other representations at different levels. Indeed, semantic priming is thought to be compelling evidence of lexical engagement (Tamminen & Gaskell, 2013). Adults (N=96), learnt 20 pseudowords associated to descriptions via oral or written modality, online. We assessed 1) to what extent do phonology and orthography play a role in word integration? 2) what word's characteristic allows for a more efficient integration? In line with recent studies, orthography should boost the acquisition of words' formal aspects as well as the link with other words leading to higher-quality representations. That is, orthographic learning would help to ease the way from lexical configuration to lexical engagement.

Title: Are CLIL pupils always in two minds? Investigating the effects of language mixing on immediate and delayed recall of information

Researcher(s): Thomas Caira, Mathieu Declerck & Esli Struys

Affiliation: Vrije Universiteit Brussel

By increasing cognitive demands in terms of language control, language mixing could negatively impact content comprehension in some cases (Declerck et al., 2019). However, experimental studies on immediate recall of information have found no adverse effects of a language mixing condition for both balanced (Anton et al., 2015) and unbalanced bilinguals (Anton et al., 2016).

Yet, due to the limited number of previous studies on this subject, several questions remain unanswered. We aim to address them in the current study. Firstly, we will also be testing the pupils' delayed recall order to observe if previously obtained results are consolidated at a later stage. Secondly, we also aim to test the participants in a monolingual L2 condition. Thirdly, participants are first and second-grade francophone pupils in CLIL programs with relatively low exposure to the other instructional language. Because of its unbalance in terms of language exposure, this CLIL context also represents a novelty compared to the contexts of previous studies.

Title: Language development and differentiation in bilingual education Dutch-Flemish Sign Language

Researcher(s): Beatrijs Wille

Affiliation: Gent University & KU Leuven

This presentation delves into the establishment of bilingual education in Dutch and Flemish Sign Language (VGT) for mainstream primary education in Flanders. It scrutinizes the necessity for differentiation in language pedagogies, instructional methodologies, and the guarantees for optimal development in spoken and signed languages across deaf, hard of hearing and hearing children with different levels of proficiency in both languages. To accomplish these objectives, a literature review was conducted followed by a qualitative data collection and analysis. This involved convening (a) 2 academic expert think tanks and (b) 5 focus group discussions engaging educational professionals from mainstream and special education, itinerant teachers, and parents. The study posits 4 distinct language profiles in deaf and hard of hearing children. Further, the findings also indicate that differentiation is desirable for all spoken and written language skills. Intensive sign language immersion is also being put forward as a suitable approach for some of the language profiles. In sum, the research contributes valuable insights into bilingual education with a minority language, the educational implementation, and the limited accessibility of the majority language for deaf and hard of hearing children.



List of Authors

Author	Page Number
Alhama, Raquel G.	40
Allen, Shanley E.M.	38
Amin, Fahd	38
Antonicelli, Giada	39
Arcidiacono, Annalisa	33
Arslan, Seçkin	18
Athanasopoulos, Panos	20
Awada, Layana	15
Baert, Lara	37
Barberis, Mara	42
Basirat, Anahita	36
Batens, Katja	43
Baulande, Noémie	34
Bautista, Ana	22
Belluzzi, Andrea	23
Benini, Elena	33
Bethke, Sandra	29
Bompais, Louison	36
Bosker, Hans Rutger	35
Brandt, Silke	20
Broekhuis, Lisan	14
Bruffaerts, Rose	24, 26
Caira, Thomas	44
Casalino, L.	22
Casalis, Séverine	44
Casaponsa, Aina	20
Çetin, Kübra Nur	38
Cheng, Ziheng	32
Cipitria, Saïoa	17
Cocquyt, Elissa-Marie	43
Coemans, Silke	40
Coppieters, Rosie	26
Corps, Ruth E.	28, 37
Cras, Patrick	24
Criel, Yana	30, 43
Crols, Silke Marie	39
Cromheecke, Oona	35
Crosiers, David	24
Dalakoura, Anna	21
De Aguiar, Vânia	40
De Clercq, Barbara	43
De Cock, Elien	43
De Cuyper, Ludovic	17
De Groote, Evelien	43
De Herdt, Veerle	43
De Keulenaer, Stéphanie	24
De Letter, Miet	30, 35, 43
De Raeve, Manon	43
Declerck, Mathieu	14, 16, 21, 43
Decuyper, Caitlin	37

Degani, Tamar	21
Demir, İlayda	42
Depuydt, Emma	30, 43
Diard, Julien	36
Dobel, Christian	27, 30
Doetjes, Jenny	32
Donnelly, Seamus	17
Drijvers, Linda	29
Drobotă, Florentina	21
Ellender, Tommas	24
Engelborghs, Sebastiaan	40
Fumel, Jules	36
Gastaldon, S.	22
Guillaume, Mélen	36
Gürvit, Hakan	42
Haekens, Nathalie	43
Hanulíková, Adriana	28
Hintz, Florian	29
Hofman, Abe	17
Housen, Alex	17
Hsieh, Cheng-Yu	31
Hustá, Cecília	29
Jacob, Gunnar	38
Jarema, Gonia	21
Jiskoot, Lize	26
Karkaletsou, Foteini	38
Keulen, Stefanie	18, 21, 25, 40
Kievit, Rogier	17
Knell, Georgia	17
Koch, Iring	16
Köpke, Barbara	15
Kösem, Anne	36
Lada, Anastasia	25
Lemaitre, Rachel	32
Lemhöfer, Kristin	32
Lemmens, Robin	42
Leyaristi, Ainhoa	23
Loerts, Hanneke	17
Lorenz, Antje	28
Lorenz, Megan G.	16
Lorette, Pernelle	22
Mairano, Paolo	44
Mancano, Martina	32
Manouilidou, Christina	25
Marelli, Marco	31
Markantonakis, Elena	32
Martin, Clara	22
McQueen, James M.	35
Meunier, Fanny	18
Meyer, Antje S.	28, 29, 35, 37
Miatton, Marijke	35, 43
Michel, Marije	17
Muylle, Merel	21
Oostra, Kristine	43

Osypenko, Oleksandra	20
Ott, Laurent	36
Özilhan, Melis Dilara	21
Papagno, Costanza	32
Paquier, Philippe	25, 40
Peeters, David	16
Peressotti, F.	22
Philipp, Andrea M.	33
Pit-ten Cate, Ineke M.	39
Raman, Nele	43
Rastle, Kathleen	31
Rivera Diaz, Dania Carolina	21
Roembke, Tanja C.	16, 33
Romanovska, Linda	39
Rowland, Caroline	17
Sagoe, Jesse	32
Sala, Marco	22
Sánchez, María	15, 21
Santens, Patrick	43
Savas, Merve	42
Schevenels, Klara	42
Schiller, Niels O.	27, 28, 30, 32
Schulz, Franziska M.	28
Seçkin, Mustafa	42
Simonetti, Matilde Ellen	16
Sprenger, Simone	25
Stalpaert, Jara	43
Steendam, Anne	40
Stolle, Sarah I.	28
Struys, Esli	14, 16, 17, 40, 43
Szmalec, Arnaud	35
Thomsen, Kristin	18
Tsapkini, Kyrana	40
Ugen, Sonja	39
Uluşahin, Orhun	35
Van den Bossche, Tobi	24
van Lieburg, Rianne	39
van Mierlo, Pieter	30, 35, 43
Van Mossevelde, Sara	24
Vandenborre, Dorien	40
Vandermosten, Maaïke	42
Vargas, Junior	44
Vespignani, F.	22
Vornehm, Isabella	40
Wang, Jin	37
Wang, Yanan	27
Wang, Yaqian	28
Wille, Beatrijs	44
Woumans, Evy	35
Xheladini, Agnesa	14
Yan, Ding	43
Ye, Lilian	17
Zhang, Qi	30
Zimianiti, Eleni	17

Scientific Committee

Mathieu Declerck

Stefanie Keulen

Esli Struys

Rose Bruffaerts

Organising Committee

Mathieu Declerck

Stefanie Keulen

Esli Struys

Rose Bruffaerts

Thomas Caira

Shilin Chen

Anna Dalakoura

Luz María Sánchez

Sarah Isabell Stolle

Agnesa Xheladini

Vrije Universiteit Brussel



VRJE
UNIVERSITEIT
BRUSSEL

This conference was co-funded by the Brussels Centre for Language Studies (BCLS) research group of the Linguistics and Literary Studies department (LIST) at the Vrije Universiteit Brussel.

