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18.15-18.30 ROUND-UP

PLENARY LECTURE

Challenges and choices in multilingual aphasia research

Monica Norvic
University of Tromso The Arctic University of Norway
monica.i.norvik@uit.no

Studying multilingual aphasia may shed light on the structure and functioning of the language system and provide insights into language processing in multilingual speakers in general. The manifestation of aphasia in multilingual individuals can vary across different languages, influenced by factors such as age of acquisition, premorbid language proficiency, and frequency of use (Kuzmina et al., 2019). Thus, conducting research based on a precise diagnosis of language impairment may be challenging.

Many multilingual individuals with aphasia, especially those who migrated from one country to another, have access to diagnostic and rehabilitation services only in one language. Therefore, treatment studies often aim for cross-linguistic treatment transfer, some showing that treatment may transfer to an untreated language but not necessarily (Goral et al., 2023).

This presentation will primarily focus on assessment challenges and solutions to bypass them, while also briefly addressing what may enhance cross-linguistic treatment transfer. Questions on distinguishing between premorbid proficiency and post-stroke language abilities, challenges with self-reports, and the assessment of all the person's languages, both in terms of assessing languages that we as researchers do not know, using interpreters, challenges with appropriate assessment tools and the complexity of interpreting data elicited from multilingual individuals with aphasia, will be addressed.

WORKSHOP TALKS

The speech of individuals with PTSD has features characteristic of Broca's aphasia

Lea Elias Isen & Kasper Boye
University of Copenhagen, Denmark
jks467@alumni.ku.dk

There is robust evidence that the blood flow in Broca's area is decreased in individuals with PTSD during a flashback (e.g. Driessen et al., 2004; Pitman et al., 2001; Shin et al., 1997). Accordingly, it has been hypothesized – especially in literature aimed at a non-expert audience – that linguistic traits similar to those characteristic of Broca's aphasia are found also in speech produced during a PTSD flashback (e.g. Cozolino, 2020; van der Kolk, 2014). The only linguistic study to date focused on similarities between PTSD and Broca's area yielded no significant results (Caglar, 2012). Several other studies have investigated linguistic traits associated with PTSD (e.g. Gayraud & Auxéméry, 2022; Hellawell & Brewin, 2004; Miragoli et al., 2019), but their findings are only marginally relevant to the question at hand.

We set out to fill this gap in the literature by running two tests: The first test compared speech produced by two participants with PTSD during a flashback (+flashback/+PTSD) to speech produced by the same participants while in a neutral or positive mood (–flashback/+PTSD). In the second test, we compared the speech they produced while in a neutral or positive mood (–flashback/+PTSD) to the speech of matched controls without PTSD (–PTSD). We found several significant differences between the +flashback and –flashback conditions. In particular, the +flashback condition was associated with shorter utterances, slower speech rate, smaller proportion of transitive verbs, higher rate of disfluencies, and higher rate of grammatical mistakes. We also found differences between the –flashback/+PTSD and –flashback/–PTSD conditions. The former condition was associated with shorter utterances, a higher rate of ellipsis of subject and/or auxiliary, and a smaller proportion of subordinate clauses. Notably, slower speech rate and shorter utterances, both present in the +flashback-condition, have been included among the features defining Broca's aphasia (Menn et al., 1990).

We base our account of the findings for the +flashback condition on Boye et al. (2023). Accordingly, we suggest that they reflect a compensatory response to a resource reduction associated with flashbacks in which language production and other cognitive functions are deprioritized to allocate more resources towards functions that might increase the likelihood of the organism surviving a life-threatening situation (e.g. Pavlícková et al., 2024; Rainnie & Ressler, 2009).

As for the –flashback/+PTSD condition, our account of the findings is that they reflect a generalized and long-term effect of the resource reduction associated with flashbacks.

Based on the fact that several studies have found people with PTSD to have a reduced Working Memory capacity reduction (Norte et al., 2024), it is natural to suspect that Working Memory is the resource – or one of the resources – being reduced.

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Morphological Processing in Patients with OCD

Zeynep Belendir
Norwegian University of Science and Technology (NTNU), Norway
belendirzeynep7@gmail.com

This study investigates morphological processing patterns in adults diagnosed with Obsessive-Compulsive Disorder (OCD), focusing on the role of procedural memory deficits in shaping these patterns. Grounded in Ullman's declarative/procedural (DP) memory model (Ullman, 2001, 2004), which distinguishes between memory systems responsible for linguistic processing, this research examines how individuals with OCD process morphologically complex words in Turkish. The theoretical framework is grounded in Ullman's DP memory model, which delineates two complementary memory systems underpinning language processing. Declarative memory, supported by medial temporal lobe structures, including the hippocampus, is responsible for the storage and retrieval of lexical knowledge and idiosyncratic linguistic information. Procedural memory, subserved by frontostriatal circuits, governs the implicit learning and automatic processing of grammatical structures and rule-based linguistic computations. Given that procedural memory deficits have been documented in OCD (Rauch et al., 1997), this study seeks to clarify the extent to which such deficits disrupt morphological processing in affected individuals.

The research is guided by two primary questions: (1) Do individuals with OCD exhibit differences in morphological processing compared to healthy controls? (2) Is there a dissociation in the processing of inflected versus derived words in OCD, and can these differences be attributed to procedural memory impairments? Prior psycholinguistic research has demonstrated that healthy adults automatically decompose both inflected and derived words into their constituent morphemes during reading (Rastle et al., 2004; Kırkıcı & Clahsen, 2013), reflecting an implicit morpho-syntactic parsing mechanism. However, whether this mechanism remains intact in individuals with OCD remains an open question.

Findings from masked priming experiments reveal a selective impairment in the processing of inflected words among individuals with OCD. While healthy participants exhibit robust priming effects across both inflected and derived conditions, individuals with OCD show significantly reduced priming effects specifically in the inflected condition. This suggests that individuals with OCD struggle with rule-based morphological decomposition, which is typically governed by the procedural memory system. In contrast, priming effects in derived and morphologically related identity conditions remain relatively intact, indicating a compensatory reliance on declarative memory-based whole-word storage. These results align with the DP model's prediction that procedural memory deficits impair rule-based morphological processing while leaving declarative memory mechanisms relatively unaffected.

The findings contribute to a growing body of evidence suggesting that procedural memory dysfunction in OCD extends beyond motor and cognitive domains to impact core language

processing mechanisms. The observed deficit in inflected forms, but not in derived words, supports the hypothesis that morphosyntactic processing is particularly susceptible to procedural memory impairments, whereas lexical retrieval of whole-word forms -related to brain structures underlying declarative memory- remains preserved.

By elucidating the link between procedural memory deficits and language processing in OCD, this study offers novel insights into the cognitive and neural mechanisms underlying linguistic processing in neuropsychiatric populations. These findings have potential implications for clinical interventions aimed at cognitive remediation and language-based therapies. Ultimately, this research enhances our understanding of how memory systems interact in both typical and atypical populations, providing a broader perspective on the neurocognitive foundations of language.

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Adapting Phonological Components Analysis therapy to French Sign Language: a multiple case study

Anna Pietzrak[a], Sylvie Moritz-Gasser[b] & Charlotte Hauser[a]
[a] SFL, CNRS, France
[b] U. Montpellier, France
anna.pietrzak@orange.fr

Background and Aims:

Sign languages (SL) are natural linguistic systems comparable to spoken languages (SpL) in terms of lexical and grammatical complexity but conveyed with a different canal. SL use a visual-gestural modality while SpL use an auditory-verbal modality. Previous works have shown that neural organization for language is canal independent, and both sign and spoken language users can be similarly affected by aphasia (showing fluent and non-fluent aphasia types, anomia, agrammatism, semantic and phonological paraphasias, neologisms…) (Goldberg & Hillis, 2022; Patel 2020). While research has mainly addressed SL aphasia on a descriptive level, this study is, to our knowledge, the first to focus on intervention. Our aim is to see if the recovery mechanisms are also canal independent. To do so, we measure the evolution of naming abilities in SL users with aphasia undergoing a version of a well-established anomia therapy, the Phonological Components Analysis (Leonard et al., 2008), adapted to the signed modality using the key parameters of sign formation (Brentari, 2011), (handshape, orientation, movement, and location).

***Methods*:**

Three SL users, one deaf person, and two hearing children of deaf adults (see metadata in Table 1) were recruited. They all presented SL aphasia in the chronic phase after a stroke (mean: 36 months post onset) including anomia in their symptoms. Participants were assessed on language and executive function skills before undergoing a three-phase protocol (control phase without treatment, training phase, withdrawal phase without treatment). Treatment consisted of 12 sessions of executive training (Bontemps et al., 2024) followed by SL-PCA: cueing production of a target sign by evoking its formal features, completing the chart shown in Fig. 1. Naming scores were collected on a list of 94 items at the beginning and at the end of each phase of the protocol (see Table 1). Items to be trained were chosen for each participant among the ones missed in the first assessments, to which we added a few succeeded items to ensure success during trials.

Results:

With these measures, we were able to evaluate recovery within participants i) spontaneously, before implementing therapy, ii) just after training, and iii) six weeks after training ended. As shown in Figure 2, the SL-PCA positively impacted naming abilities both for trained items and untrained items, showing generalized improvements that persisted after therapy withdrawal across all participants. For two of them, the training phase was the one showing the best improvements, for treated and untreated items. Additionally, all participants reported increased confidence and ease in SL communication after undergoing treatment.

Conclusions and Implications:

This study provides encouraging evidence for the effectiveness of a signed adaptation of a SpL-oriented therapy, emphasizing shared mechanisms underlying aphasia in both modalities. Such adaptations could address the gap in care options targeting SL users with aphasia. These findings show the need for further research in SL-aphasia recovery methods.

Figure 1. *SL-PCA chart for the sign [egg] (B): handshape (top left box) is as in [wind] (A), orientation is hand back and then palm toward the signer (top right box), location (bottom left box) is as for [soccer] (C), movement is a curve (bottom right box). Drawings A, B, and C represent LSF signs, they are added here for clarity purposes and are not used during therapy.*

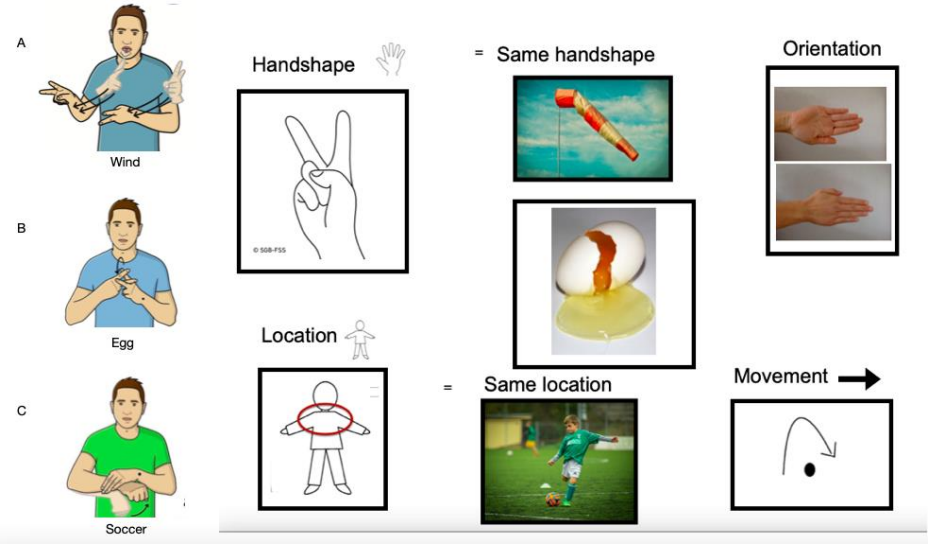
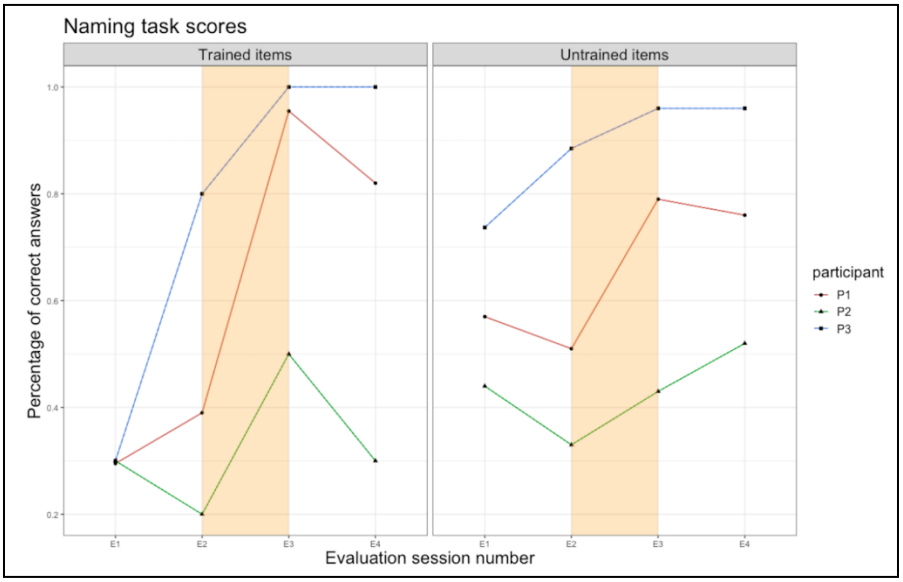


Table 1. *Participants'metadata and scores at each evaluation session. Scores obtained after training (E3) are presented in orange. *Mpo = months post onset. **NT= naming task.*

Code part	Age	Gender	Mpo*	Hearing status	NT** E1	NT E2	NT E3	NT E4
P1	32	M	32	Hearing	62.5/93	58/93	78/93	76/93
P2	62	F	33	Deaf	46.5/93	37.5/93	46/93	53/93
P3	47	F	43	Hearing	72.5/93	84/93	90/93	90/93

Figure 2: *Percent of correct answers to the target picture given in less than 5 sec. in trained items (left panel) and untrained items (right panel), across sessions (x-axis) and participants (lines). The orange area indicates the period during which participants underwent training (phase B).*



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Language/brain co-evolution: Focus on autism and the striatum

Ljiljana Progovac
Wayne State University
progovac@wayne.edu

In order to understand the ultimate causes of cognitive/linguistic disorders, it is helpful to take into account evolutionary considerations, in particular, the co-evolution of language and the human brain. Here I focus on cortico-striatal brain networks, whose neuronal connectivity was significantly enhanced in the line of descent of humans, implicating recent mutations in *FOXP2* and other genes (Enard et al., 2009; Hillert, 2014; Dediu, 2015). These networks are involved in the processing of language, including metaphoricity (associated with cross-modality) and complex syntax/grammar (Gibson, 1996; Lieberman, 2000, 2009; Teichmann et al., 2005; Ullman, 2006; Ardila et al., 2016a, 2016b; Progovac et al., 2018a,b).[1] Surprisingly, perhaps, this network is also essential for the suppression of reactive aggression, and for emotional reactivity more generally, which may be the reason why increased aggressive behaviors and atypical language tend to correlate in cognitive disorders, including autism (Benítez-Burraco and Progovac 2021).

The proposal is that atypical rigidity in autism, both linguistic rigidity and behavioral rigidity, have a common cause which lies in the enhanced striatal activity, the result of a reduced control of the striatum by the cortical structures (Benítez-Burraco and Progovac 2023, 2024). Autism often involves interneuron dysfunctions that give rise to an altered inhibition of specific cortico-striatal circuits, resulting in reduced control of striatal activity by cortical structures (Rapanelli et al., 2017; McBride and Parker, 2015; Nelson and Valakh, 2015; Traynor and Hall, 2015.) Linguistic rigidity in autism is manifested as hyper-systemizing and hyper-attention to rules and details (Baron-Cohen et al., 2009; Ward et al., 2017), as well as interpreting metaphors and non-literal language literally, i.e. rigidly. Complex syntax is also affected in autism (e.g. Prévost et al., 2017; Durrleman et al., 2017; Ambridge et al., 2021; Silleresi et al., 2018). Behavioral rigidity encompasses repetitive, stereotypical actions, resistance to change, as well as less flexibility in suppressing reactive aggression by finding alternatives (Langen et al., 2009; Hill et al., 2014).

Crow (2000) suggested that schizophrenia is "the price that Homo sapiens pays for language" and let us add that autism is included in that price, with the two phenomena acting as opposite poles in the otherwise continuous individual variability in humans (e.g. Crespi and Badcock 2008). This individual variability has been essential not only for evolving language, but also for maintaining language as we know it. This is so because language throughout its evolution has relied on both rigid patterns and rules (strengths of (relatives of) autism) and on flexibility and fluidity, including

[1] In fMRI experiments with both English and Serbian-speaking participants, Progovac et al. (2018a,b) found a direct relevance of cortico-striatal brain networks for processing incrementally more complex syntax, using as the baseline the structures reconstructed by Progovac (2015) as evolutionarily older, providing plausibility for the proposal that human brains co-evolved with the emergence and complexification of syntax and language more generally.

non-literal, metaphorical language (strengths of (relatives of) schizophrenia). It is only a delicate (and fragile) balance between the two that characterizes typical populations.

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Emergent morphological sensitivity in reading by Greek early school children

Margarita Xanthaki[a] & Styliani N. Tsesmeli[b]
[a]Maastricht University
[b]Department of Education and Social Work, University of Patras, Greece
ritaxan997@gmail.com

The study investigated the emergence of morphological sensitivity in reading among Greek early school children and examined developmental differences in morphological processing by comparing their performance to that of skilled adult readers. Specifically, the study explored whether second- and third-graders rely on morphemes during visual word recognition, the extent to which this process is effortful or automatic, and how the ability for morphological processing differs from that of university students. Additionally, the study examined whether Greek children and students are facilitated more by the semantic or form properties of morphemes during visual word recognition. A total of 44 typically developing Greek school children (ages 8–9 years, Grades 2–3) and 25 university students (mean age: 19–20 years) participated. Children were preliminary evaluated by two standardized tests of reading words and non-words and two standardized tests of spelling words and written vocabulary. They were firstly assessed by three morphological tasks constructed for the study: (1) a homophone spelling task (N=32 items) where participants had to spell words that sound the same but differ in meaning, (2) an oral word analogy task (N=24 pairs of a common stem) where children should spell the missing morphological word, after recognizing the common stem of the first word-pair and (3) a deletion and a reversal task (N=16 items) where children should give orally a compound, after deleting its first or second constituent. Table 1 provides examples of each morphological task. Secondly, children and students participated in a timed masked lexical-decision task using E-prime 3.0 to manipulate form/meaning overlap. All items were of low frequency with high frequent bases and balanced in terms of morphological transparency. Items divided in six experimental conditions, each containing 10 prime-target pairs, as follows: (a) Morphological (Form+, Meaning+), (b) Orthographic (Form+, Meaning-), (c) Semantic (Form-, Meaning+), (d) Pseudomorphological (Form+, Meaning-), (e) Unrelated (Form-, Meaning-) and (f) Morphological (prime)/ Pseudomorphological (target) (partial Form+, Meaning-). Table 2 provides examples for each experimental condition. Results showed that Greek children as early as second grade showed sensitivity to the morphological structure of complex words, as they took longer to process word pairs with morphological structure compared to word pairs that shared only semantic or only orthographic relationships. However, this ability to process morphologically complex words does not appear to be an automatic process for second- and third-grade students, as indicated by longer reaction times in the morphological condition. Developmental differences emerged, with third graders outperforming second graders and university students demonstrating the fastest reaction times and highest accuracy. This pattern supports findings from Fleischhauer et al. (2021) and Lazaro et al. (2018), suggesting that morphological processing improves with age and

reading experience. Additionally, all participants benefited more from morpho-semantic than morpho-orthographic relationships, recognizing meaning-based morphological pairs more quickly than pseudomorphological ones. These findings are compatible with the experimental literature and have important implications for understanding the role of morphology in children's visual word recognition which is essential for their reading acquisition and subsequent academic progress.

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Table 1. *Examples for Morphological Tasks*

Task Type	**Examples**
Homophone Spelling task	μηλιά–μιλιά/ milia - milia/apple tree – voice
Word Analogy task	μέρα – καλημέρα/νύχτα - καληνύχτα/ mera – kalimera/ nichta-kalinichta/ day – good day/ night-goodnight
Deletion task	ονοματεπώνυμο – επώνυμο/ onomateponimo - eponimo /fullname - name
Reversal task	θαλασσοπούλι = πουλί + θάλασσα/ thalassopouli = puli + thalassa/ seabird = bird + sea).

Table 2. *Examples for the Lexical Decision Task Experimental Conditions*

Experimental Condition	**Examples**
Morphological (Form+, Meaning+)	βιβλίο – βιβλιοπώλης /vivlio-vivliopolis/ book-bookseller
Orthographic (Form+, Meaning-)	αβγά - άβγαλτος /avɣa - avɣaltos/ eggs - innocent
Semantic (Form-, Meaning+)	μαργαρίτα – λουλούδι /marɣarita - luluði/ margarita - flower
Pseudomorphological (Form+, Meaning-)	σαβλίο - σαβλιοπώλης /savlio - savliopolis/
Unrelated (Form-, Meaning-)	άλογο - φρούτο /aloɣo - fruto/ horse - fruit
Morphological (prime)/ Pseudomorphological (target) (partial Form+, Meaning-)	βιβλίο - σαβλιοπώλης /vivlio - savliopolis/ book - savliopolis

Reaction Time in Phonological Tests Predicts Reading Skills in Preschool Children

Tatiana Eremicheva & Svetlana Dorofeeva
Center for Language and Brain, HSE University, Russia
eremichevat22@gmail.com

Introduction:

Phonological processing (PP) skills are widely known as one of the most effective predictors of reading acquisition (Wagner et al., 1994). Children with poor PP skills are more likely to face reading difficulties. Thus, it is necessary to choose age-appropriate testing instruments that will indicate the possible impairments as early as possible. Former researchers mostly estimated the predictive power of accuracy in PP tests (Thompson et al., 2015). However, the reaction time (RT) in phonological tests also can be considered as a significant reading predictor since it indicates the differences in cognitive load during reading (Raney, 1993). Hence, we decided to assess the RT in PP tests, words- and pseudowords reading skills in preschool children.

Method:

Participants. Participants were 98 Russian-speaking preschool children (5.4 – 7 years), all had no history of diagnosed neurological or speech disorders, with normal hearing and vision. 7 participants scored below their normative level on the non-verbal IQ test (Raven, 2004). Thus, the final sample included the results of 91 children (41 girls, $Mean_{age}$ = 6.38 years, SD = 0.37).

Materials. Phonological processing skills were assessed with the RuToPP test battery (Dorofeeva et al., 2022). The battery included 7 phonological tests (3 on speech perception and 4 on speech production). We analyzed the results of 3 speech perception tests, where accuracy and RT were measured automatically. Reading skills were assessed with the STARS test battery (Dorofeeva et al., 2021). We used lists A (with words) and B (with pseudowords).

Procedure. First, children performed the phonological tests, second, they performed the non-verbal IQ test and, lastly, they read words and pseudowords (for 1 minute each). The sequence of the tests remained the same for all participants. The procedure was performed in the kindergarten and took 30-40 minutes.

Results:

After we conducted the RT comparisons, we found that the RT in *Phoneme Discrimination* test was significantly higher than in *Lexical Decision* test (W = 7411, p < .001). Moreover, RT in *Phoneme Detection* test was significantly higher than in both *Phoneme Discrimination* test (W = 1738, p < .001) and *Lexical Decision* test (W = 444, p < .001). The regression analysis showed that the RT in *Phoneme Detection* test was a significant predictor of the pseudowords reading accuracy (E = 0.30, p < .001). However, the Akaike information criterion showed that the model with accuracy as a predictor was better (AIC = 94.52).

Discussion:

It was shown that in more difficult PP tests the RT was higher. Furthermore, it was proved that RT can be considered as a predictor of reading. The results on the RT are in line with our previous findings on the accuracy in PP tests being a predictor for early reading skills (Eremicheva & Dorofeeva, 2024). In the future we would like to test the predictive power of the RT from PP tests on speech production.

This work was conducted as a part of the Basic Research Program at the HSE University.

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Brain potentials reveal that perceptual salience mediates maturation of French-speaking adolescents' auditory gender agreement processing

Guillaume Blais[a], Émilie Courteau[b], Karsten Steinhauer[c] & Phaedra Royle[a]
[a]Université de Montréal, Centre interdisciplinaire de recherche sur le cerveau et l'apprentissage (CIRCA), Center for Research on Brain, Language and Music (CRBLM)
[b]Dalhousie University
[c]McGill University
guillaume.blais@umontreal.ca

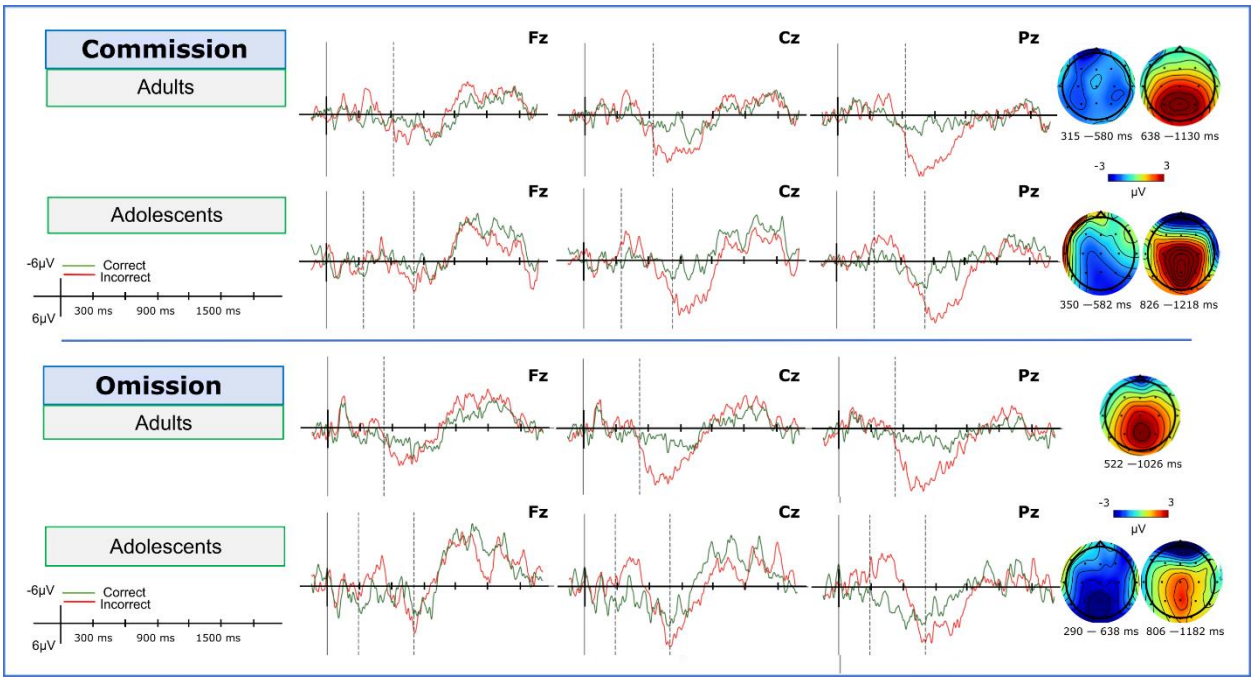
We investigated agreement error effects for noun-adjective gender mismatches in French-speaking adolescents and adults using an audio-visual event-related potential (ERP) paradigm. The main goals of this study were 1) to test whether gender agreement violations elicit different ERP patterns in adults and adolescents and 2) to test whether these differences, if any, are consistent across perceptual salience. Research on grammatical processing employing neuroimaging in adolescence is scarce, and few studies have investigated how these processes consolidate in adolescents. Some show that grammatical processing can be mature in adolescence (Clahsen et al., 2007), others that it is still consolidating (Weber-Fox et al., 2010), and some that grammatical processing depends on variables such as transparency and regularity (Blais et al., 2024) and perceptual salience (Dube et al., 2016; Dube et al., 2019). We explored adjective opaque gender agreement mismatches by distinguishing between highly salient errors of commission (e.g., *chapeau* ***verte*** 'green$_F$ hat$_M$'), and less salient ones of omission (e.g., *chaise* ***vert*** 'green$_M$ chair$_F$'). In French, feminine adjective gender can be unpredictably marked with a final consonant (*vert* - *verte* /vɛʁ/ - /vɛʁt/ 'green$_M$ - green$_F$') or be unmarked (e.g., *jaune$_M$* - *jaune$_F$* /ʒon/ 'yellow$_{M/F}$). This makes its corresponding commission errors highly salient, as the presence of an erroneous consonant is less frequent, and less acceptable than the absence of overt feminine marking. We predicted that highly salient gender agreement mismatches would elicit adult-like brain potentials in adolescents while less salient ones would show age group differences.

We tested adolescents and adults on French adjective agreement violations in a visual-auditory mismatch paradigm. 21 French-speaking adolescents (aged 10–15 years) and 29 adults (aged 19–39 years) saw images of colored objects followed by auditory sentences describing them (e.g., [GREY KEY] primed *la clef grise* 'the$_F$ key grey$_F$'). Participants made grammaticality judgements on each sentence. Sentences describing these objects could either (a) be grammatically correct (*Je vois la clef grise sur la table* 'I see the$_F$ grey$_F$ key on the table'), or (b) contain a gender error on the adjective (*la clef gris** 'the$_F$ grey$_M$ key'), which could either be i) a commission error (*grise* [gʁiz] for *gris* [gʁi]) or ii) an omission error (*gris* for *grise*).

We averaged ERPs on mismatching adjectives and compared them to their corresponding correct conditions (i.e., *grise* correct vs. *grise* incorrect). Time windows for analyses were

extracted using cluster-permutation analyses. EEG data was then fitted into mixed linear models. Commission mismatches show a N400-like-negativity followed by a P600 in both groups, where the adolescents' negativity is visually more posterior compared to the adults while showing no statistical differences. Omission mismatches, on the other hand, show differences between groups. Namely, a P600 in adults, and a broad and early N400 followed by a P600 in adolescents. We argue that the N400-like negativity present in both groups for the salient commission condition indicates that processing of this error is mature, whereas its presence in teens only in the less salient omission condition reflects immaturity characterized by additional lexical processing load.

Figure 1. *Grand average waveforms at Fz, Cz and Pz electrodes and scalp topography for* ***commission*** *correct vs incorrect (chaise verte–chapeau *verte 'green$_F$ chair$_F$ – green$_F$ *hat$_M$) and* ***omission*** *correct vs incorrect (chapeau vert–chaise *vert 'green$_M$ hat$_M$ – green$_M$ *chair$_F$'), in adults and adolescents, with a -150–150 ms baseline. Difference wave time windows illustrated with head plots (right) were extracted using cluster permutation analyses at Pz*



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Eye-tracking study of unambiguous anaphora resolution in Russian

Olga Tuzhik[1], Aigul Khanova[3], Semen Kudryavtsev[1], Vladislava Staroverova[1],
Nina Zdorova[1,2], Tatiana Shavrina[2], Olga Dragoy[1,2]
[1]National Research University Higher School of Economics
[2]Institute of Linguistics, Russian Academy of Sciences
[3]Kazan Federal University
vikolya2002@gmail.com

Introduction:

Anaphora resolution is the process of linking an anaphor (e.g., a pronoun) to its antecedent (e.g., a noun). There are many factors that influence anaphora resolution under ambiguity, that is, in cases where one anaphor can semantically and grammatically correspond to more than one antecedent (see, for example, Järvikivi et al. 2005). Relatively few eye-tracking studies are devoted to anaphora resolution under *unambiguity*. In Russian, the choice of the antecedent can depend, in particular, on the syntactic role of the antecedents, their animacy, and the rhetorical distance between the antecedent and the anaphor (Prokopenya, 2016; Delikishkina & Fedorova, 2012; Fedorova et al., 2010; Gagarina, 2007). We studied the influence of these factors on anaphora resolution in *unambiguous* contexts.

Method:

The study was based on the EyeWino dataset (Kozlova et al., 2024) that includes eye movement data during silent reading in 100 adult Russian native speakers (81 women, Mage = 22.68, *SD* = 4.27). Participants read 150 sentences with two potential antecedents, where only one of them corresponded semantically to an anaphor. Below each sentence, there was a question of whether the anaphora could be resolved in a given way (see Figure 1).

Analysis:

Analysis was conducted using R (R Core Team, 2024). We examined two basic measurements of eye movements: gaze duration on the anaphor (GD), and its total reading time (TT), both measured in msec. These measurements reflect both early (GD) and late (TT) language processing. A mixed-effects linear regression model was built for each measure. Fixed effects included the correct and incorrect antecedents' animacy, syntactic role, and standardized distance to the anaphor, measured in the number of letters (excluding punctuation and spaces). Random effects included anaphor frequency, anaphor length in letters and the participants' unique IDs.

Results:

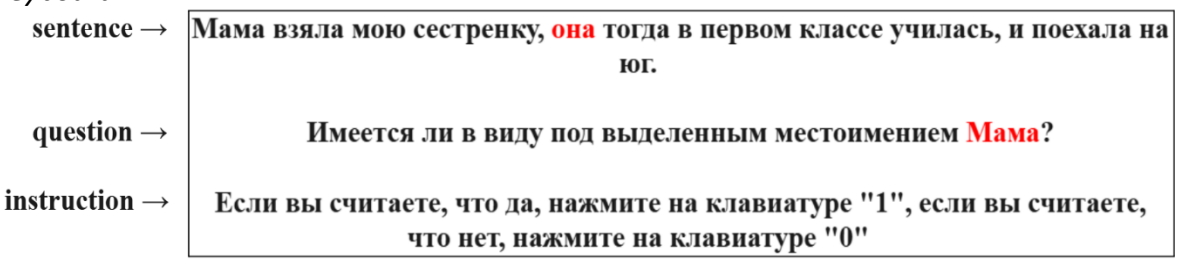
The mean response accuracy was 0.93, *SD* = 0.25. None of the independent variables had a significant effect on GD. However, animacy of the incorrect antecedent and its distance from the anaphor significantly affected TT: the latter was less in cases where the incorrect

antecedent was inanimate (*Est. = -0.10, SE = 0.02, CI = -0.13 – -0.06, p < .001*) and in cases where incorrect antecedent was further from the anaphor (*Est. = -0.02, SE = 0.01, CI = -0.04 – -0.01, p = .015*).

Discussion:

The syntactic role did not significantly affect the TT, which is consistent with (Prokopenya, 2016), but different from (Delikishkina & Fedorova, 2012; Gagarina, 2007). The TT was affected by two properties of an incorrect antecedent, namely by animacy, which is consistent with (Gagarina, 2007), and by distance (in letters), which has not been previously studied in anaphora resolution. It can be assumed that these properties (inanimacy and larger distance) allow one to quickly identify antecedent as incorrect, and therefore anaphora is being resolved faster. The features of the correct antecedent being insignificant may indicate that, when resolving anaphora, a reader pays attention to the lexical meaning first, and then, if it does not allow them to select the antecedent unambiguously, they rely on antecedent's other properties.

Figure 1. *An example of a stimulus: a sentence, a question, and an instruction on how to answer with a keyboard*



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Mapping the gradual loss of evidentiality in Pomak using a self-paced reading experiment

Seçkin Arslan & Evangelia Adamou
French National Centre for Scientific Research (CNRS), France
Seckin.ARSLAN@univ-cotedazur.fr

Background:

Evidentiality refers to the grammatical encoding of the source of information. It is typically acquired later in the developmental stages (Aksu-Koç, 1988). Additionally, research on heritage speakers indicates that evidentiality is prone to the impact of language change (as seen in Turkish, Arslan et al., 2015, 2017). Bilingual experiences also play a role; for instance, low daily exposure to the heritage language is linked to non-target uses of evidentiality (Arslan and Bastiaanse, 2020). We explore the decline of evidentiality in Pomak, a minoritized Slavic language spoken in the Thracian peninsula (Adamou, 2010). According to Adamou (2013), older Pomak speakers traditionally use a specialized verbal form to indicate indirect evidentiality in folktales, whereas younger speakers are shifting to using the perfect form.

Method:

We administered a self-paced reading experiment to 25 Pomak speakers living in Greece (M*age* = 39, SD = 17). The participants were highly proficient in both Pomak and Greek and had a certain degree of Turkish (self-reported proficiency: Pomak M=4.4/5, Greek M=4/5, Turkish M=2.96/5). They read 40 Pomak sentences under two conditions—perfect (1) or evidential (2)—and provided acceptability ratings at the end of each sentence. The sentences featured Nasradin Hodza, a traditional character from local folktales (see 1-2).

1. Nasradin,	ye	klal,	şiker,	faf,	çayen.
‘Nasradin	has	added	sugar	in	his tea.’

2. Nasradin,	klal,	şiker,	faf,	çayen.
‘Nasradin	added(EVD)	sugar	in	his tea.’

Results:

Judgments. Results showed significant fixed effects of Condition and an interaction between Age and Condition. This suggests that the participants found perfect forms more acceptable. However, this effect was influenced by age, with younger participants rating evidential forms as less acceptable than their older generations (Figure 1).

Reading times. Notable differences emerged in the reading times, particularly in region 2 where the verb appeared. We found significant effects of Age (ß=0.38, SE=0.15, *t*=2.47, *p*=0.02) and

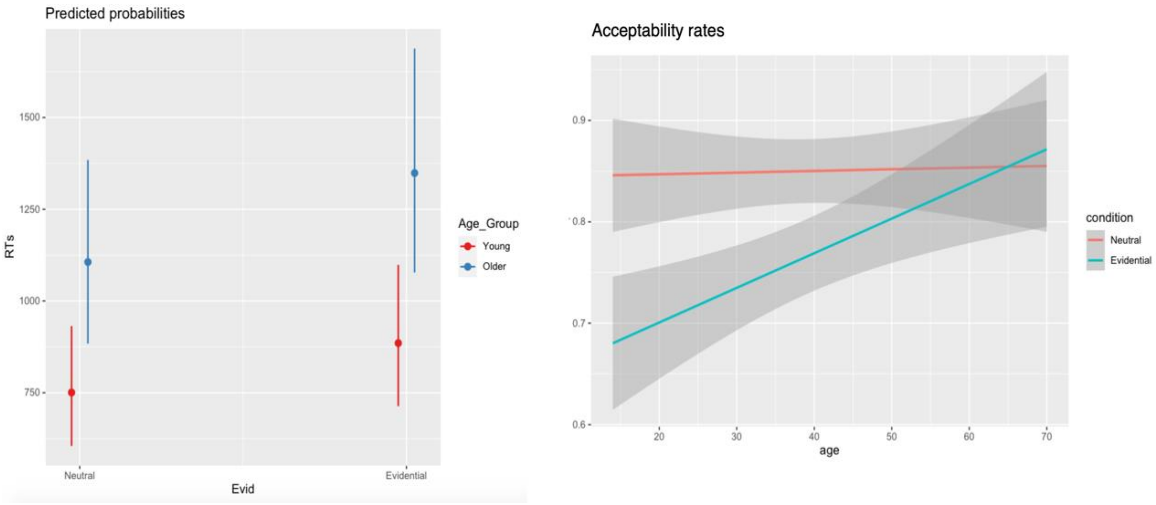
Condition (ß=0.16, SE=0.05, *t*=2.87, *p*=0.004), indicating that older participants read more slowly, and that both groups read evidential verbs with longer RTs.

Discussion:

Our results suggest that Pomak speakers have reduced sensitivity to grammatical evidentiality, comparable to Turkish heritage speakers in Europe (Arslan et al. 2015, 2017). We interpret these results as evidence that Pomak evidential forms are undergoing reduction, possibly due to contact with Greek, a language with no grammatical evidentiality (Adamou 2013).

Keywords: evidentiality; processing; reading experiment; judgment task; Pomak

Figure 1. *Pomak participants' reading times at region 2 (left, perfect/evidential verb), and end-of-sentence acceptability rates (right).*



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Distributional approach to polysemy disambiguation in error-driven learning

Ksenija Mišić[a,b] & Dušica Filipović Đurđević[a,b,c]
[a]Laboratory for Experimental Psychology, University of Belgrade – Faculty of Philosophy
[b]Department of Psychology, University of Belgrade – Faculty of Philosophy
[c]Laboratory for Experimental Psychology, Faculty of Philosophy, University of Novi Sad
ksenija.misic@f.bg.ac.rs

Error-driven learning (EDL; Hoppe et al., 2021) represents a simple, yet powerful framework grounded in well-established cognitive processes. Whenever a cue and an outcome occur together, the relationship would strengthen, whenever the outcome does not follow the cue, their relationship weakens. This was implemented into language (Baayen et al., 2011) by mapping orthographic information obtained by splitting words into overlapping trigraphs that were used as cues, and the word itself as its semantic representation. Within this approach, many linguistic phenomena were successfully simulated. However, few attempts were made to simulate the polysemy effect within EDL. Polysemous words are words with multiple related senses (Rodd, 2020). For polysemous words one set of orthographic cues has differing outcomes (senses), depending on the context the word is in. Therefore, a standard approach of mapping word trigraphs to a single outcome is not suitable for polysemy. Hence, we relied on the distributed approach to disambiguate senses and to test whether EDL representations can account for polysemy effects in a lexical decision task.

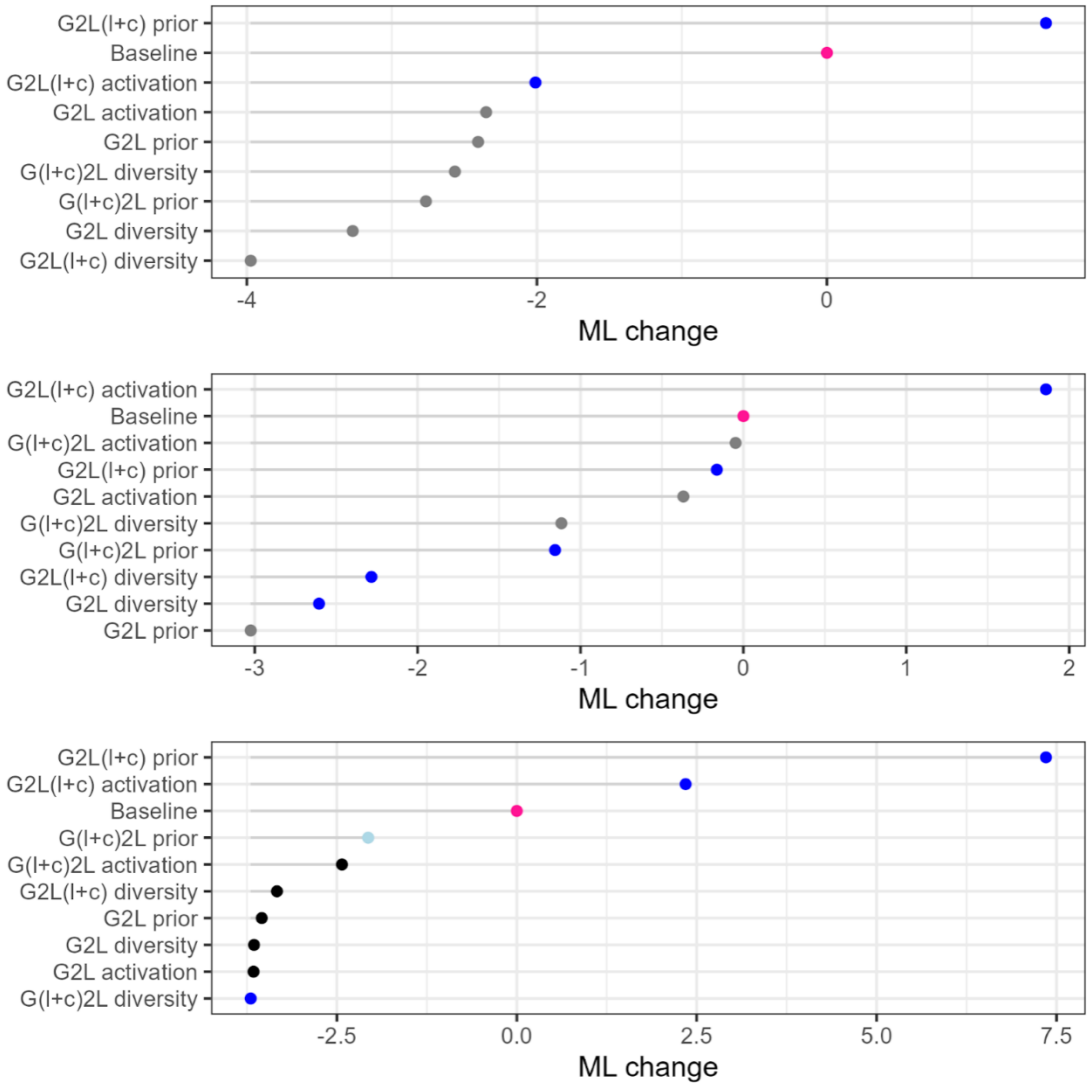
We explored this approach by comparing two types of EDL simulations. In G2L(l+c), a replication of Filipović Đurđević & Kostić (2023), the cues were overlapping trigraphs from the polysemous words, and outcomes were disambiguated senses. Disambiguation was achieved by adding words from the immediate context in the corpus. The relatedness between senses was operationalised as the overlap between contexts and was expected to facilitate learning. However, a question may be posed whether the disambiguation occurs at the outcome or the cue level. Therefore, we ran another simulation (G(l+c)2L; Filipović Đurđević & Milin, 2019) where polysemous word and context words for each corpus occurrence were split into trigraphs and served as cues to the single-word outcome.

Each of the simulations was run for three parts of speech (PoS; nouns, verbs, and adjectives), as a way to test the generalisation of the findings. Regardless of the PoS, each occurrence of 308 polysemous words in total was extracted from the SrWaC corpus (Ljubešić & Klubička, 2016) with three words before and after. These context words were filtered to reduce their number and facilitate simulations while keeping frequency variation. The extracted data was used as input cue-outcome data.

From the output matrix containing the relationship strength between cues and outcomes, several EDL-based variables can be calculated that represent various aspects of learning. We compared the predictive power of variables originating from the three simulations. Figure 1.

reveals the ranking of models containing EDL predictors (and control variables) when compared to a baseline model (control variables only). For all three PoS, the results reveal an advantage for G2L(l+c) simulation. Overall, disambiguation at the outcome level leads to representations that seem to predict polysemous processing better, compared to the disambiguation at the cue level.

Figure 1. *ML change compared to the baseline model (pink). Each panel represents one PoS, nouns, verbs, and adjectives, respectively. Blue dots denote predictors with significant effects on processing, light-blue marginally significant, and grey ones non-significant.*



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Exploring contact-induced change in word order in Istanbul Greek

Philip Zakhariadis-Awad[a], Sofia Prokou[b], Seçkin Arslan[a]
[a]Université Côte d'Azur, BCL, CNRS, France
[b]National and Kapodistrian University of Athens, Department of Turkish and Modern Asian Studies, Greece

philip.zakhariadis-awad@etu.univ-cotedazur.fr

Background:

Istanbul Greek (IG) is a lesser-studied dialect where contact-induced structures have emerged, distinguishing it from Modern Standard Greek (MSG). This study investigates potential changes in word order in IG. Both Turkish and Greek exhibit considerable word order flexibility (see e.g., Georgiafentis & Lascaratou, 2013); however, they differ in their base word orders: Turkish follows SOV order (Erguvanli, 1984), while Standard Greek is typically considered to have SVO order (Dover, 1960; Alexiadou, 1999). The latter may have diachronically evolved from the ancient SOV order of Classical Greek (Lavidas, 2015). Tzanidaki (1995) analyzes spoken corpus data in MSG, showing that the SVO order dominated the corpus, while other word orders were less preferred (with all OV forms representing only 20%). With this in mind, we explored whether and to which extent speakers of IG have been influenced by the dominant use of the Turkish SOV structure.

Methods:

We recruited 21 native speakers of IG (15 females, mean age = 60.14, SD = 22.27). The participants were highly proficient in both Greek, their minority home language, and Turkish, the dominant societal language. We conducted an open-ended, semi-spontaneous speech production task, where participants were asked to describe their daily lives and childhood memories. The spoken samples were transcribed and analyzed. Additionally, we administered a spoken sentence listening experiment that included an end-of-trial acceptability judgment task, featuring six possible word orders in Greek using simple declarative sentences, see Table 1.

Table 1. E*xample stimulus sentences from the end-of-trial judgement task*

Condition	Stimulus
SVO	Ο γάιδαρος τρώει το μήλο. DET·M donkey eat.PRES DET·N apple
SOV	Ο γάιδαρος το μήλο τρώει DET·M donkey DET·N apple eat.PRES
VSO	Τρώει ο γάιδαρος το μήλο Eat.PRES DET·M donkey DET·N apple
VOS	Τρώει το μήλο ο γάιδαρος Eat.PRES DET·N apple DET·M donkey
OVS	Το μήλο το τρώει ο γάιδαρος DET·N apple it eat.PRES DET·M donkey
OSV	Το μήλο ο γάιδαρος το τρώει. Το μήλο ο γάιδαρος το τρώει DET·N apple DET·M donkey it eat.PRES
Eng. Translation	[The donkey]$_{SUBJ}$ eats [the apple] $_{OBJ}$

Results:

The production data revealed that participants produced an average of 113.6 utterances, with 149.47 verbs on average, equating to approximately 1.3 verbs per utterance. The average counts of OV and VO structures were 27.2 and 39.27 respectively. This difference was statistically significant ($t(16.669) = -3.3741$, $p = 0.003$). We calculated the OV order ratio by dividing the total number of OV structures by the total number of VO forms. The OV ratio in our sample was 0.48 (SD = 0.37, ranging between 0.16 to 1.45). Even in a small sample of speakers this variability is remarkable, and only four speakers analyzed closely so far have shown OV structures within proximity to 20% reported in Tzanidaki (1995).

The sentence acceptance data showed that IG participants predictably preferred the SVO order over all other orders (all comparisons, ß > 0.22, p > 0.04), see Figure 1. Model outputs revealed a preference for the VO order over OV (ß = 2.04, SE = 0.27, t = 7.4, p < 0.001). Additionally, there was a significant effect of age (ß = 0.03, SE = 0.01, t = 11.07, p < 0.001) and a significant interaction between order and age (ß = -0.02, SE = 0.01, t = -4.28, p < 0.001), see Figure 2.

Discussion:

A conclusion that can be drawn from this study is that IG seems to have been included by the dominant Turkish OV order, as this is clearly visible in production. However, a monolingual comparison is still needed to determine whether these differences reflect a significant shift due to language contact. Furthermore, sociodemographic factors (e.g., gender, contact with mainland Greece, education) and linguistic backgrounds may further contribute to individual variation, widening the response range.

Figure 1. *Proportion of acceptance rating scores across different order conditions (left) and summarised OV versus VO orders (right).*

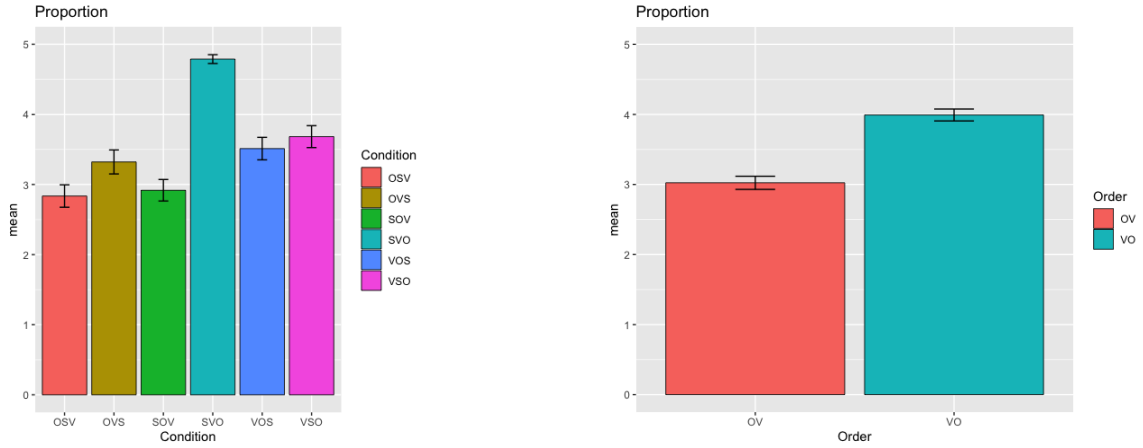
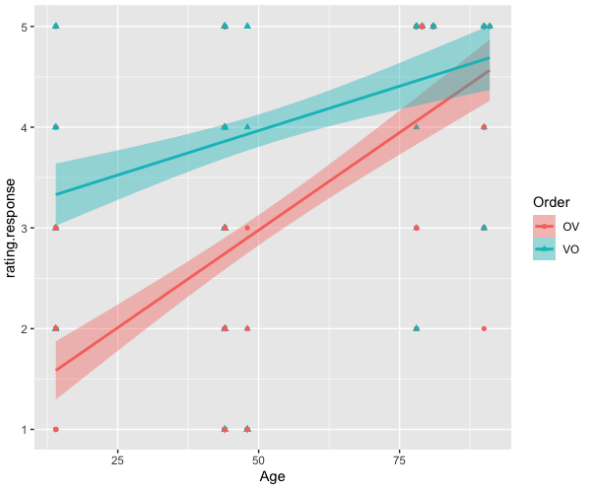


Figure 2. *Sentence rating estimates across participants' age.*



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Similarities and Differences in the Emotional Experience of Emojis: A Serbian and Slovenian Sample

Milica Popović Stijačić [a,b,c], Aleksandra Stanimirović [a,b], Iva Anžel Zuko[a] & Magdalena Miković[a]
[a] Department of Psychology, Faculty of Media and Communications, Singidunum University
[b] FMK Lab, Laboratory for Psychological Research, Faculty of Media and Communications
[c] Laboratory for Experimental Psychology, Faculty of Philosophy, University of Novi Sad
milica.p.stijacic@gmail.com

Emotional experience of stimuli is typically defined along two key dimensions: emotional valence (EV) and arousal (A). EV reflects whether a stimulus is perceived as pleasant or unpleasant, while A represents the intensity of the emotional experience, ranging from calming to arousing. The relationship between EV and A is often described by a quadratic (U-shaped) function, observed in both pictorial and lexical stimuli (Kuppens et al., 2017; Kutsuzawa et al., 2022). Over the past few decades, digital communication has expanded alongside technological advancements, with emojis emerging as essential pictorial symbols that complement or replace words in conveying emotions. This study explores similarities and differences in the emotional experience of emojis between two South Slavic populations: Serbians and Slovenians.

A total of 202 participants completed an online questionnaire: 146 Serbians (16.3% male, aged 18–59, M = 25, SD = 8.06) and 56 Slovenians (32.1% male, aged 18–72, M = 38, SD = 14.72). Participants rated 99 of the most frequently used Apple® iPhone emojis (Unicode: Was & Hamrick, 2021; Daniel, 2021) on EV and A using a seven-point Likert scale and reported their emoji usage frequency on a five-point scale. The study was conducted online via the SoSci platform, and data were analyzed using JASP software (JASP Team, 2024). Paired-sample t-tests assessed differences in emotional experience and emoji usage between the two groups.

Results (Table 1) indicate that Serbian participants provided significantly lower ratings for EV, A, and emoji usage frequency compared to Slovenians (Table 2). The expected U-shaped relationship between EV and A was confirmed (Figure 1), but only a small subset of positively valenced emojis had arousal ratings above 4, denoting a neutral arousal level. Negative (unpleasant) emojis did not elicit high arousal, suggesting that only highly positive emojis convey excitement, while the interpretation of neutral and negative emojis is likely more context-dependent.

These findings suggest that emojis, like words, act as carriers of emotional experience. While EV and A follow a quadratic function, only positive emojis exhibit high arousal, whereas neutral and negative emojis tend to be perceived as non-arousing. Our study also reveals significant differences in emoji perception between Serbian and Slovenian participants. Moreover, different arousal experiences of negative emojis, compared to arousal experiences of negative words (Popović Stijačić et al., 2023) in both samples, suggests that emojis are more ambiguous

in terms of meaning, and that context plays a significant role in the determination of their emotional experience, which requires further investigation.

Table 1. *Descriptive statistics for the emotional valence, arousal, and subjective frequency of emoji use for Serbian and Slovenian sample*

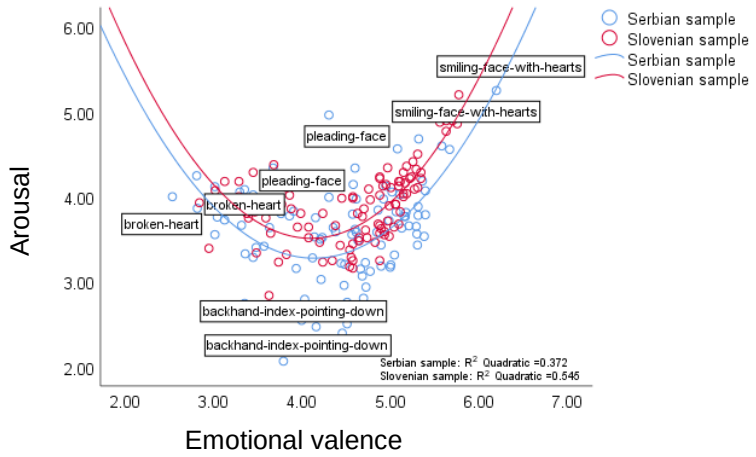
	EV Srb	A Srb	F Srb	EV Slo	A Slo	F Slo
Mean	4.418	3.603	2.128	4.553	3.881	2.306
Std. Deviation	0.785	0.617	0.547	0.710	0.447	0.515
Skewness	-0.227	0.027	0.866	-0.590	0.245	0.774
Std. Error of Skewness	0.243	0.243	0.243	0.243	0.243	0.243
Kurtosis	-0.465	0.358	1.194	-0.545	0.515	0.490
Std. Error of Kurtosis	0.481	0.481	0.481	0.481	0.481	0.481
Shapiro-Wilk	0.983	0.984	0.951	0.943	0.983	0.957
P-value of Shapiro-Wilk	0.232	0.253	0.001	< .001	0.225	0.003
Minimum	2.534	2.068	1.185	2.839	2.714	1.268
Maximum	6.192	5.247	3.870	5.768	5.196	3.893

Note: EV – Emotional valence; A – Arousal; F – Frequency of use; Srb – Serbian sample; Slo – Slovenian sample

Table 2. *Paired sample t-test for the emotional valence, arousal and frequency of emoji ese between Serbian and Slovenian sample*

Serbian		Slovenian	t	df	p	Cohen's d
EV	-	EV	-4.096	98	< .001	-0.412
A	-	A	-8.124	98	< .001	-0.817
Frequency	-	Frequency	-5.510	98	< .001	-0.554

Figure 1. *Scatterplot of the Emotional Valence and Arousal, with the Quadratic fit of their Relationship*



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POSTER PRESENTATIONS

What can motor speech disorders tell us about the connection between language and speech?

Bernadett Dam
University of Szeged, Hungary
bernidam96@gmail.com

Motor speech disorders (MSDs) can be characterized by impaired planning, programming, control, or execution of *speech* (Duffy, 2013). They are distinguishable from language disorders or cognitive deficits that could affect the speech output. Subsequently, we would expect that people who are diagnosed with an MSD without any co-occurring cognitive-linguistic disturbances should not show any atypical linguistic patterns, the observable disturbances should arise in the articulatory-acoustic domain. However, as recent studies have illustrated (Šubert et al., 2025; for a less recent study see Illes et al., 1988), speech samples of people with MSDs and healthy controls show differences in terms of linguistic content (e.g., the frequency of grammatical components). Unexpectedly, some differences can be observed even in written language production. For example, patients with apraxia of speech show decreased written language output (reduced number of words and sentences) compared to healthy controls (Tetzloff et al., 2025).

Most models of speech production (for a review see Levelt, 1999) suggest that the process starts with conceptualization and ends with articulatory actions. However, we should consider that for many speakers with MSDs, speech can be effortful (e.g., in the case of spastic dysarthria) or fatiguing (Duffy, 2013). If cognitive abilities are preserved, these speakers may opt for more concise expressions. I argue that in these cases, the linguistic content is directly influenced by the articulatory abilities of the speaker (or more precisely, their self-evaluation regarding their articulatory abilities).

The notion that MSDs – disorders that supposedly affect the production of speech without impairing cognitive-linguistic processes – have effects on the linguistic content leads us to several theoretical questions. First, can we truly separate the processes of linguistic and motor speech planning? How do these two processes influence each other? What can we infer about these processes and their state based on the surface, that is, the produced speech sample? Which methodologies, or rather, combinations of methods are most helpful to answer the previous questions?

In this presentation I aim to shed light on the above-mentioned questions based on the results of some recent research projects and by drawing conclusions from theoretical considerations. I intend to synthesize these findings to see which theoretical questions we can answer through conducting empirical studies. Lastly, I argue for the importance of working in multidisciplinary teams, and combining methods and insights from different fields.

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Syntactic adaptation in Modern Greek

Sofia Axioti
Leiden University, the Netherlands
s.axioti@outlook.com

Syntactic adaptation refers to the tendency of comprehenders to take previously encountered structures into account during processing. Following syntactic adaptation, structures that are initially preferred by comprehenders lose their processing advantage (Fine et al., 2013; Kaan & Chun, 2018). Previous studies investigated the occurrence of syntactic adaptation for English speakers. Fine et al. (2013) found that comprehenders quickly adapt to syntactic structures based on local statistical patterns, showing slower reaction times for initially easier-to-process main verb structures compared to relative clause structures. Kaan et al. (2019) demonstrated that native speakers show syntactic adaptation when processing locally ambiguous sentences that are resolved toward a non-preferred interpretation in filled gap constructions in wh-clauses. The present study aimed to investigate whether syntactic adaptation was present in locally and globally ambiguous structures in Modern Greek. Specifically, it sought to explore whether syntactic adaptation could occur in structures where local ambiguities would be disambiguated through gender agreement and whether reversed preferences, brought on by syntactic adaptation, would persist in globally ambiguous sentences, where no disambiguation would take place. Previous literature has indicated that when presented with a choice between high or low-attachment of a relative clause to a matrix clause, Greek speakers prefer high-attachment (Papadopoulou & Clahsen, 2003). Sixty native Greek speakers were recruited and exposed to different types of attachment for relative clauses. Locally ambiguous sentences were disambiguated through gender agreement between the adjective/participle of the relative clause and either DP-1 (high-attachment) or DP-2 (low-attachment) of the matrix clause (1-2). Globally ambiguous sentences could bear either high or low-attachment, since gender agreement was ambiguous. It was expected that by the end of the experiment, the participants would show preference for low-attachment, since this was the least preferred structure initially. Contrary to the study's expectations, after conducting analyses with (generalized) linear mixed models, no preference was found for either structure (high or low-attachment). The null effect was observed for both locally and globally ambiguous sentences. As such, the findings of the aforementioned studies were not reflected in this study's results. Unexpectedly, grammatical gender was found to be a relevant factor. Specifically, when the gender of the DP-1 was masculine, the sentence was processed more quickly than when the DP-1 was feminine. In summary, no evidence of syntactic adaptation was observed for locally or globally ambiguous sentences in Greek.

Examples

Locally Ambiguous Sentences: High-Attachment (1) and Low-Attachment (2)

(1) Ένας κύριος φώναξε τον φοιτητή
Enas kirios fonakse **[ton fititi]DP-1**
a man called the.MASC.SG.ACC student.**MASC**.SG.ACC

της καθηγήτριας που φαινόταν
[tis kathigh-itrias]DP-2 pu fenotan
the.FEM.SG.GEN teacher.FEM.SG.GEN that seemed.SG

απογοητευμένος από το νέο εκπαιδευτικό σύστημα.
apoghoitevmenos apo to neo ekpedheftiko sistima.
disappointed.**MASC** by the new educational system.

"The man called the student of the teacher who was disappointed with the new education system."

(2) Ένας κύριος φώναξε τον φοιτητή
Enas kirios fonakse [ton fititi]DP-1
a man called the.MASC.SG.ACC student.MASC.SG.ACC

της καθηγήτριας που φαινόταν
[tis kathigitrias]DP-2 pu fenotan
the.FEM.SG.GEN teacher.**FEM**.SG.GEN that seemed.SG

απογοητευμένη από το νέο εκπαιδευτικό σύστημα.
apoghoitevmeni apo to neo ekpedheftiko sistima.
disappointed.**FEM** by the new educational system.

"The man called the student of the teacher who was disappointed with the new education system."

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The comprehension of French subject and object relatives in Primary Progressive Aphasia: Testing the role of number dissimilarity and phonological cues.

Mauro Viganò
UMR 7023 Structures Formelles du Langage, CNRS
Université Paris VIII, Paris, France
dott.mauro.vigano@gmail.com

Background:

The asymmetry in the comprehension of subject relatives (1) and object relatives (2) is a well-documented phenomenon in people with aphasia (Adelt et al., 2017). One possible explanation relies on the syntactic notion of minimality effect, which suggests that object relatives are more challenging to process across languages, including French, due to a potential structural interference of the subject, underlined in (2) (Grillo, 2008). Morphosyntactic dissimilarities between the head of the relative and the subject could reduce the minimality effect and facilitate comprehension, (3). A key objection is that overt morphology provides a superficial cue for meaning extraction without full syntactic processing (Terzi & Nanousi, 2018).

(1) *Montrez-moi* ***le magicien***$_i$ *qui* **t**$_i$ *suit le chef*
"Show me the magician that chases the cook"

(2) *Montrez-moi* ***le magicien***$_i$ *que* ***le chef*** *suit* **t**$_i$
"Show me the magician that the cook chases"

(3) *Montrez-moi* ***le magicien***$_i$ *que* ***les chefs*** *suivent* **t**$_i$
"Show me the magician that the cooks chase"

French provides an ideal testing ground because number feature is active in subject-verb agreement but not always phonologically marked. For example, the difference between singular and plural is audible in *suivre* ("to chase", /syi/ *vs*. /syiv/) but not in *pusser* ("to push", singular=plural: /pus/).

Objectives:

This study investigates the comprehension of relatives in French across the three variants of Primary Progressive Aphasia (PPA). In particular, it tests the effect of these three factors:

- *type of relative*: subject *vs*. object;
- *number dissimilarity*: present *vs*. absent;
- *audibility of number dissimilarity*: overt *vs*. covert difference.

Methods*:*

We included 13 native French-speaking participants with PPA (nonfluent: 3; logopenic: 3; semantic: 7) diagnosed according to standard criteria (Gorno-Tempini et al., 2011). Exclusion criteria were MMSE <15/30 and BREF<10/18 (Kalafat et al., 2003; Dubois et al., 2000). Auditory

comprehension of subject and object relatives was assessed using a sentence-to-picture matching task with character selection (Friedmann et al., 2009; *Figure 1*), considering the three factors (2x2x2 design, 6 items per condition + 24 control sentences; 72 items in total). Given the small sample size, accuracy rates were analysed with descriptive statistics and with Cohen's *h* for effect sizes.

***Results**:*

Object relatives reported lower accuracy than subject relatives in the logopenic (Δ=63%, *h*=1.145) and the nonfluent variants (Δ=38%; *h*=0.902); *Figure 2*. Participants with the semantic variant performed at ceiling across conditions. The presence of number dissimilarity in object relatives emerged as a facilitation factor in the logopenic (Δ=19%, *h*=0.433) and the nonfluent variants (Δ=36%; *h*=0.742); *Figure 3*. No effect was found for the audibility factor (logopenic: Δ=0%, *h*=0; nonfluent: Δ=11%; *h*=0.249); *Figure 4*.

Conclusions:

Our preliminary results support the role of number dissimilarity in facilitating the comprehension of object relatives at an abstract level, regardless of its phonological realisation. This supports a syntactic explanation, in terms of minimality effect, over a cue-based account of sentence disambiguation, in terms of overt morphology. Moreover, the study contributes to our understanding of syntactic impairments in PPA, highlighting the importance of considering morphosyntactic features in language assessment.

Figure 1. *Example of picture stimulus.*

Figure 2. *Effect of type of relative.*

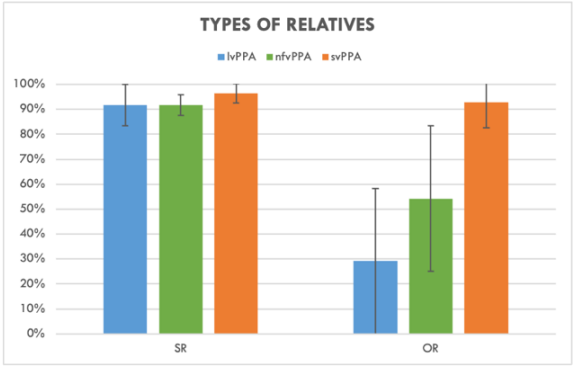


Figure 3. *Effect of number dissimilarity.*

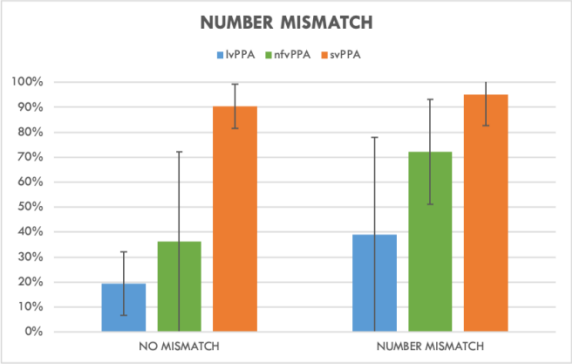
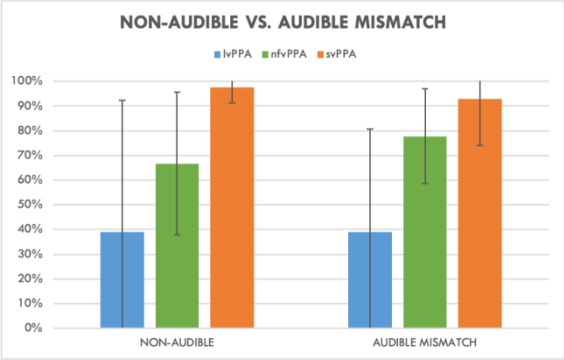


Figure 4. *Effect of audibility.*



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Processing of Different Grammatical Features by Adolescents: an ERP Study on Russian

Sophia A. Shumilova[a], Daria V. Antropova[a], Elizaveta I. Galperina[b], Olga V. Kruchinina[b], Natalia A. Slioussar[a]
[a]National Research University Higher School of Economics, Russia
[b]Institute of Evolutionary Physiology and Biochemistry RAS, Russia
shumilova.sophia@gmail.com

The aim of our study is to compare how adolescents process grammatical gender, number, and case in Russian and to contextualize our results with respect to previous theoretical and experimental works, including those examining processing by adults. There are very few studies that have investigated the peculiarities of adolescents' processing of grammar (see Courteau et al., 2023; Blais et al., 2024 for French), and these were primarily focused on the processing of gender and number only. However, in Russian, case remains an inflectional feature of nouns and some other parts of speech, which makes it indispensable in cases of attributive agreement. Therefore, in this study processing of grammatical case is examined as well.

We conducted an ERP study with the voluntary participation of 11 native speakers of Russian (3 m, 8 f) aged 14–17 (mean age = 15.5 years). While undergoing an EEG, participants silently read the set of 400 sentences, which were demonstrated word by word in rapid serial visual presentation mode in the center of the laptop screen. For 1/4 of the sentences, they also provided grammaticality judgments. All sentences were structured identically but differed according to concrete purposes: target sentences contained mistakes in either predicative (with gender or number mismatches) or attributive (with gender, number, or case mismatches) agreement, and fillers were grammatically correct. The method of ERPs has established itself as a robust tool for exploring language processing in real time. To date, such components as LAN, N400, and P600 have been extensively discussed, but other components (e.g., MMN and N200) are claimed by some researchers to appear during language production or comprehension, too (Kaan, 2007).

So far, only the data on the attributive agreement have been analyzed. It has been observed that the amplitudes of ERPs across mismatch conditions are considerably larger as compared to the correct sentences. Post-hoc Sidak correction showed a significant difference in the processing of all types of mismatches. For gender mismatches, N400 was observed in the left-anterior region in the time window 300-400 ms ($F(3, 63) = 0.969$, $p = 0.029$), as well as an early P600 occurring in the central region of the left hemisphere between 450 ms and 700 ms ($F(3, 63) = 4.232$, $p = 0.024$). Number mismatches caused LAN, appearing between 180-250 ms in anterior regions ($F(3, 63) = 7.792$, $p = 0.027$), between 250-450 ms in central regions ($F(3, 63) = 3.117$, $p = 0.013$), and between 380-450 ms ($F(3, 63) = 1.184$, $p = 0.037$) in parietal regions of the right hemisphere. Case mismatches caused an early LAN in frontal and central regions: the negative component was observed in anterior sites of the cortex in TW 100-150 ms ($F(3, 63) =$

6.287, p = 0.001) and in frontocentral regions of the right hemisphere in TW 180-250 ms (F(3, 63) = 7.792, p = 0). Case mismatches also caused a P600 component, which appeared in the central regions of the left hemisphere in TW 450-700 ms (F(3, 63) = 4.232, p = 0.046). Significant differences were observed between different mismatch conditions as well.

Thus, all types of agreement mismatches induced a processing cost. Along with the well-known N400 and P600, some early components were discovered that appear in case mismatches. During the presentation, we will discuss significant differences between the types of mismatches and attempt to provide a functional explanation for the qualitative data received.

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Pre-experimental Instructions and Distractors as Design Choices in Language-based EEG experiments

Charisti Styliara
University of Groningen, the Netherlands
xaristyl@gmail.com

Pre-experimental instructions comprise an integral part of an experimental setup and can be encountered in different types and forms. For instance, they may be provided as written orders or derive from the interaction between the researcher and the participant of an experiment. In addition, they may be restricted to the procedural description of what the participant is asked to do, or they may serve the overt portrayal of the experiment's goals. However, the actual level and type of help that these instructions offer have been questioned lately (Hillman et al., 2018). Another critical methodological choice for language-based EEG experiments is the type of distractors that are leveraged. Specifically, when the focus of the study is on morphosyntax, the use of meaning-based comprehension questions is usually preferred, aiming to avoid drawing the participant's attention to the target stimuli (Keating & Jegerski, 2015). Nonetheless, only a limited number of investigations have assessed this hypothesis (indicatively, Leeser et al., 2011 & Parhammer et al., 2019).

This study investigates the effect of a) Pre-experimental instructions and b) Distractors on the processing of morphosyntactic errors. Two groups of Greek native (L1) speakers will participate in the study. Participants are presented with sentences word-by-word on a computer screen, while their brain activity is recorded with the use of electroencephalography. In Experiment 1, both groups are shown grammatical (control), ungrammatical (experimental), and garden-path (filler) sentences, and the only difference between the groups is the type of pre-experimental instructions that they receive. In Experiment 2, both groups are exposed to grammatical (control) and ungrammatical (experimental) sentences. For the filler sentences, the first group is given grammatical and ungrammatical sentences, including a different type of morphosyntactic error from the control and the experimental sentences, while the second group is shown semantically congruent and incongruent sentences.

This is an ongoing project, which aims to provide the research community with helpful insights with respect to design choices in language-based EEG experiments.

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Isn't it a wonderful day to go to the beach? How ASD children process rhetorical questions: an eye-tracking study

Federica Longo[a], Flavia Marino[b] & Alessandra Falzone[a]
[a]Università degli Studi di Messina, Italy
[b]IBIS-CNR, National Research Council, Italy
federica.longo1@studenti.unime.it

Rhetorical Questions (henceforth, RQs) are a particular type of interrogative sentences that display commonalities with both Ordinary Questions (henceforth, OQs) and affirmative sentences. Consider the RQ in (1) below:

(1) Are you able to drive properly?!

While RQs and OQs share identical syntactic structures, they serve different communicative purposes. In an OQ, the speaker seeks information they don't know and expects an answer from their interlocutor. In contrast, in RQs the speaker already knows the answer and the utterance does not require a reply, as with affirmatives (Biezma & Rawlins, 2017; Caponigro & Sprouse, 2007).

One type of RQ is the negative *yes/no*-RQ in (2) (see Rudanko, 1993), which is obtained, in Italian, by negating the positive OQ in (3). Crucially, although (2) contains the same words as the negative statement in (4), it receives a pragmatic interpretation suggesting the following positive answer: It is a nice day to go to the beach.

(2) Non è una bella giornata per andare al mare?! ("Isn't it a nice day to go to the beach?!")
(3) È una bella giornata per andare al mare? ("Is it a nice day to go to the beach?")
(4) Non è una bella giornata per andare al mare. ("It is not a nice day to go to the beach.")

Thus, the hearer does not interpret (2) as an information seeking OQ but infers the RQ-status by relying on contextual or prosodic cues and shared background knowledge. Existing research reports that individuals with Autism Spectrum Disorder (henceforth, ASD) experience difficulties in understanding non-literal language, like irony and indirect requests. However, no study to date has examined the online comprehension of RQs like (2) in children with ASD, and little is known about how typically developing (henceforth, TD) children process them.

The present study, as part of my PhD project, seeks to address the following research questions:

a. To what extent do autistic children understand *yes/no*-RQs negative in form, compared to TD children?

b. How quickly does the RQ-interpretation arise during online sentence comprehension?

To address these questions, we will test the online comprehension of *yes/no*-RQs negative in form with a picture selection task with eye movement recording (cf. Figure 1).

Three groups of participants will be assessed: a group of children with ASD recruited from the National Research Center (IBIS-CNR) in Messina, Italy; a TD-group matched by chronological age; a TD-group matched by non-verbal intelligence. All participants are Italian native speakers. Moreover, non-verbal intelligence, first- and second-order Theory of Mind, executive functions and language abilities will be assessed through standardized tasks.

The results of this experiment will provide insight into how various factors — such as non-verbal IQ, Theory of Mind, executive functions, and language abilities — contribute to the comprehension of RQs across different groups. Furthermore, it will shed light on the role of real time processing in understanding RQs.

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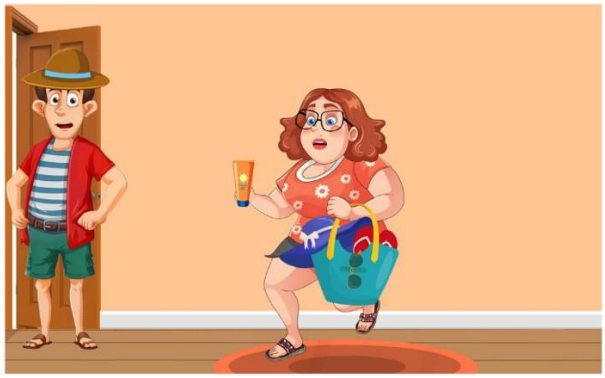
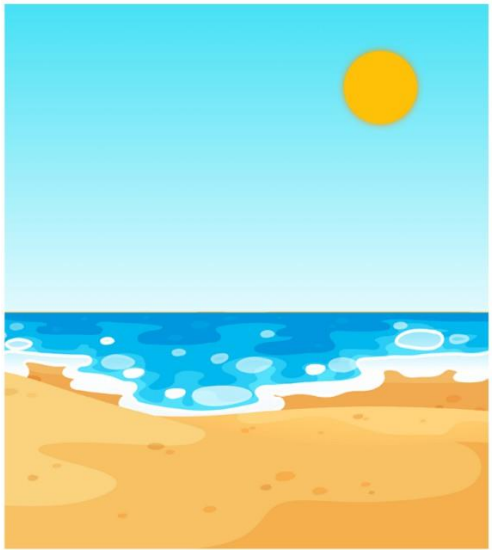
Figure 1. *Example of experimental stimulus. Participants listen to a pre-recorded story while watching pictures on a screen. The story ends with a target sentence (RQ vs negative statement) while two images (target vs. competitor) appear on the screen. Participants' eye movements will be recorded from the target sentence onset.*

1. Mattia e Francesca hanno deciso di andare al mare.
"Mattia and Francesca decide to go to the beach."



2. Quando Mattia apre la porta per uscire, guarda il cielo e dice:
"When Mattia opens the door to leave, he looks at the sky and says:"

3.**TARGET SENTENCE (RQ vs negative statement)** **RQ:** Non è una bella giornata per andare al mare?! "Isn't it a nice day to go to the beach?!" **Negative statement:** Non è una bella giornata per andare al mare. "It is not a nice day to go to the beach."



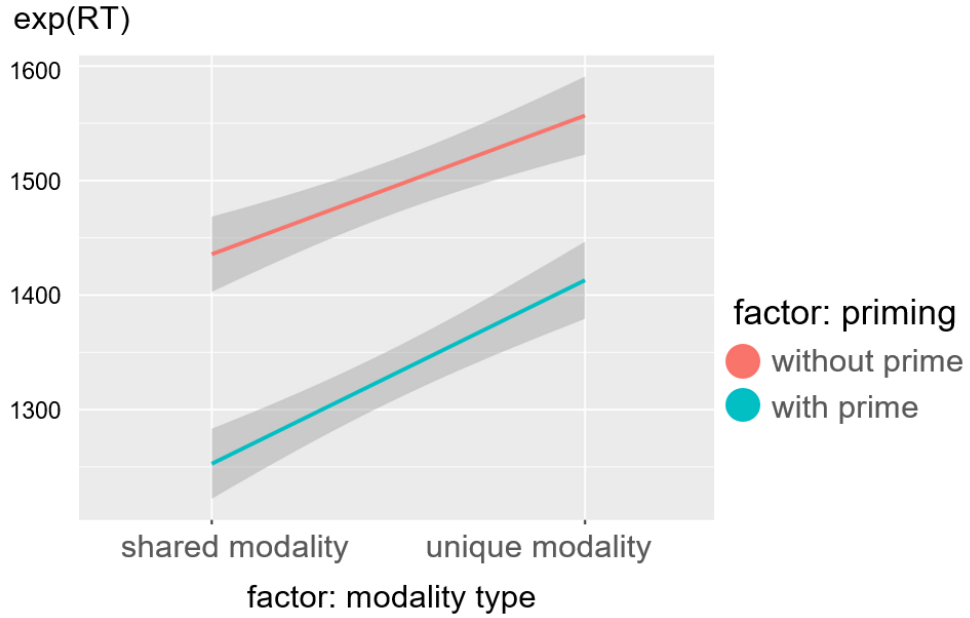
Influence of sensory information in priming among polysemous senses

Sara Božić[a,b] & Dušica Filipović Đurđević[a,b,c]

[a]Laboratory for Experimental Psychology, University of Belgrade – Faculty of Philosophy
[b]Department of Psychology, University of Belgrade – Faculty of Philosophy
[c]Laboratory for Experimental Psychology, Faculty of Philosophy, University of Novi Sad
sara.andjelic@f.bg.ac.rs

Most words are polysemous, i.e. have two or more related senses (Rodd et al., 2002), which must be considered when postulating the word meaning representation theories. Activation of one polysemous sense facilitates activation of another sense (facilitatory priming effect; Klepousnioutou et al., 2008), which is explained by a postulated representation *core* consisting of the shared features among senses (Rodd et al., 2004). We used this effect to look into models of embodied cognition that assume that the basis of a mental representation of an object is a simulation of a previous sensorimotor (SM) experience with it (Barsalou, 1999; 2008). Therefore, it can be predicted that a core shared among senses would also contain shared modality-specific SM information. To test that, we examined whether the activation of a modality-specific mental representation of one word sense facilitated the activation of the same modality mental representation of another word sense. We conducted a semantic verification experiment using a priming paradigm with 40 pairs of polysemous senses (e.g., *a sealed letter* and *an italic letter*). The critical comparison referred to the difference between trials where sensory modality shared among senses was focused (e.g. seeing both *a sealed letter* and also *an italic letter*) and where sensory modality unique to prime-sense was focused (e.g. touching is associated with *a sealed letter* but not with *an italic letter*). Participants (N = 102) had to verify if they had ever had the described experience. The final analyses were conducted on 30 sense pairs that elicited at least 75% of predictable responses (an experience that is expected/not expected). Compared to the control condition, where abstract stimuli were used as primes, targets in trials with sensible primes were verified faster ($\beta = -.14$, $CI\ [-.17 – -.11]$, $t = -8.36$, $p < .01$). However, our main hypothesis concerned the interaction between the priming and sensory modality and the expected interaction was observed: when shared modality was focused, the priming effect was larger ($\beta = .05$, $CI\ [.01 – .09]$, $t = 2.25$, $p < .05$). The interaction effect, although small in size, showed unequivocally for the first time that the shared core of polysemous senses consisted not only of semantic but also of sensory features because the priming was stronger when, in addition to the shared semantic features, the shared sensory features were also activated. This finding suggests the compatibility of two previously unrelated theoretical views on the activation of mental representations.

Figure 1. *Reaction latencies to primed and unprimed condition with senses that shared or did not share the sensory modality.*



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Determined, but not everywhere: regional variation in multiple determination in Bulgarian

Vesela Simeonova[a], Elizaveta Kracheva[b], Diego Pescarini[b], Seçkin Arslan[b]
[a]Karl-Franzens-University of Graz, Austuria
[b]Université Côte d'Azur, BCL, CNRS, France
Seckin.ARSLAN@univ-cotedazur.fr

Overview:

This study probes the variability of the multiple determination construction in Bulgarian. We find that it is most accepted in Sofia (West) and least accepted in Varna (East).

Background:

MULTIPLE DETERMINATION (MD) is a phenomenon where a nominal phrase contains more than one marker of definiteness. In Bulgarian, it is realized as a combination of a demonstrative pronoun and an adjective marked with a definite article, (1a) (Rudin, 2018). Crucially, the construction is optional and colloquial, not merely a type of agreement. The standard construction involves only indefinite elements following a demonstrative, cf. (1b).

(1) a.	Tazi	novata	kola(ta)	multiple determination (MD)	
	this.$_F$	new.***DEF***	car.***INDEF/(DEF)***	***dem+def+indef=MD1; dem+def+def=MD2***	
b.	Tazi	nova	kola	standard construction	
	this.$_F$	new.***INDEF***	car.***INDEF***		
	'this new car'				
c.*	Tazi	nova	kolata	ungrammatical	
	this.F	new.INDEF	car.**DEF**		

Research question:

Friedman & Rudin (2021) compare MD in various Balkan languages, situating Bulgarian on a cline of acceptability. However, Rudin (2018) reports high variability in the acceptability judgments in Bulgarian, especially in contrast with the high acceptability of the construction in Macedonian, but does not survey potential sociolinguistic factors. We hypothesise that the acceptability of MD in Bulgarian would increase with regional proximity and contact with Macedonian.

Methods:

We recruited 60 native Bulgarian speakers from three regions of Bulgaria: Sofia (N = 17), Sandanski (southwest) (N = 20), and Varna (north-east) (N = 23). We conducted a timed phrase reading study combined with an end-of-trial acceptability judgment task. The experiment included 20 items across four conditions: *(1)Adj.DEF + Noun.DEF (MD2 in (1a)), (2) Adj.DEF + Noun.INDEF (MD1 in (1a)), (3) Adj.INDEF + Noun.DEF (1c), (4) Adj.INDEF + Noun.INDEF (1b).* We controlled for gender and animacy across all nouns in the stimuli.

Results:

Figures 1 and 2 demonstrate the mean and predicted probabilities. Outputs from a logistic linear mixed effects regression show significant fixed effects of the presence of definite marking on AdjP (ß = -0.52, SE = 0.24, z = -2.12, p = 0.03), that on the NP (ß = 4.04, SE = 0.19, z = 20.79, p < 0.001) and of the region (ß = -3.03, SE = 0.71, z = -4.24, p < 0.001). We also found an interaction between the three factors (ß = 4.74, SE = 1.30, z = 3.63, p < 0.001).

Discussion:

The results show that the acceptability of MD2 was low across the board, on a par with the ungrammatical Adj.indef+Noun.def combination (1c). MD1, on the other hand, has a different acceptability profile and varies across regions of Bulgaria (Figures 1 and 2). Acceptability ratings were the lowest in the North-East (Varna), but highest in the Sofia region and not in the region closest to Macedonia, i.e. Sandanski. Our study presents a pioneering cross-sectional application of psycholinguistic experimentation in fieldwork on language variation in Bulgarian. One clear conclusion from this study is that a simple psycholinguistic outcome (such as phrasal acceptability) is subject to large variability within Bulgarian, due possibly to areal contact with other Balkan languages. In support of this, Friedman & Rudin (2021) report variation in Macedonian MD constructions due to contact with Albanian.

Figure 1. *Mean acceptance rates across conditions*

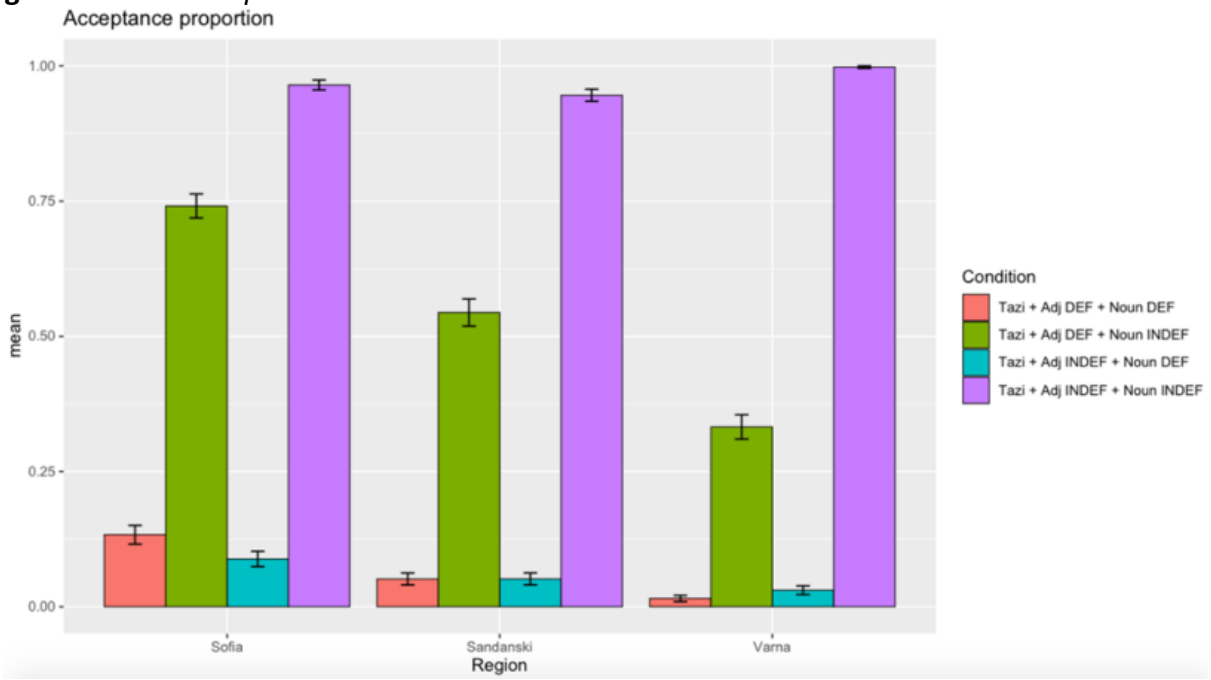
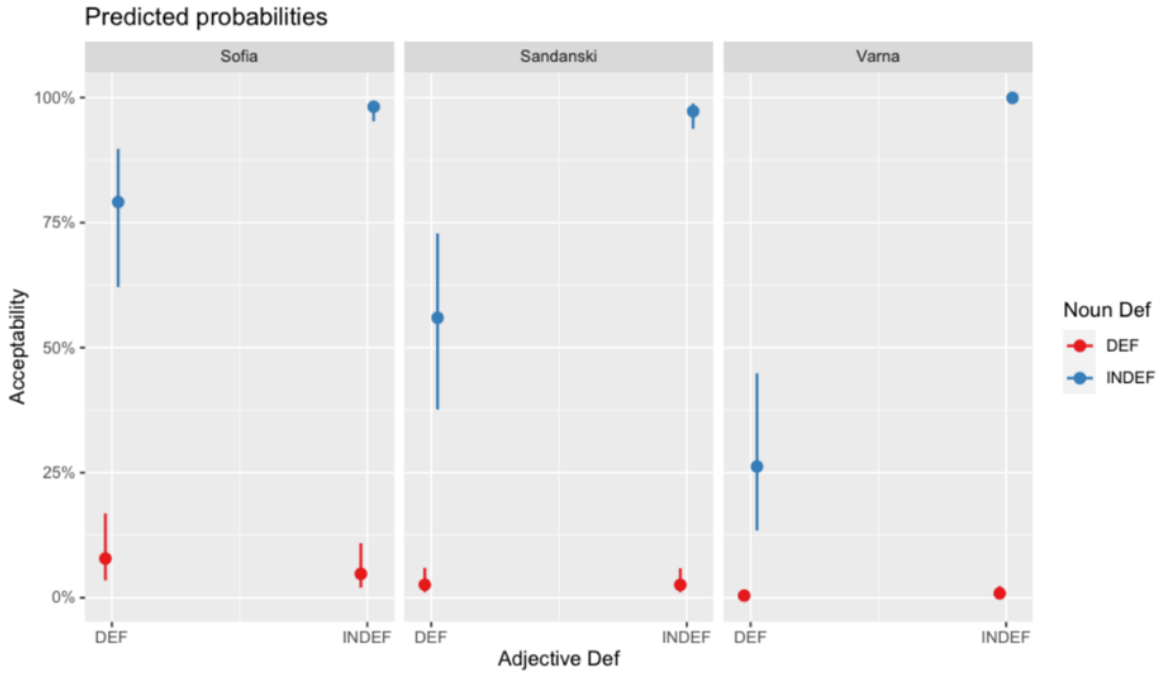


Figure 2. *Predicted probabilities across regions*



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