11th Novi Sad workshop on

Psycholinguistic, neurolinguistic and clinical linguistic research

Book of abstracts

Novi Sad
April 20, 2024

PROGRAMME

9.00 WELCOME NOTE

09.15-10.45 SESSION 1: LANGUAGE DISORDERS IN ADULTS (Chair: Silvia Martínez Ferreiro)

09.15-09.45 Anđelka Zečević (Mathematical Institute of the Serbian Academy of Sciences and Arts, Serbia) & Teodora Srećković (School of Electrical Engineering, University of Belgrade, Serbia): *Digital Markers of Dementia: Supporting Early Diagnostic of Alzheimer's Disease*

09.45-10.15 Maria Letizia Piccini Bianchessi (University School for Advanced Studies IUSS Pavia, Italy) & Adriana Belletti (University of Siena, Italy): *The comprehension of passive constructions in patients affected by Alzheimer's disease*

10.15-10.45 Giorgia Albertin (Alma Mater Studiorum - University of Bologna, Italy): *Cohesion in cognitive decline: a study on a corpus of Italian elderly speakers*

10.45-11.00 COFFEE BREAK

11.00-13.30 SESSION 2: CHILD LANGUAGE (Chair: Seckin Arslan)

11.00-11.30 Vladislava Staroverova (Center for Language and Brain, HSE University, Moscow, Russia) & Anastasiya Lopukhina (Royal Holloway, University of London): *Development of the perceptual span in Russian-speaking children*

11.30-12.00 Mirjana Mirić (Institute for Balkan Studies, Serbia): *Complementizer omission in Gurbet Romani: a developmental perspective*

12.00-12.30 Zdorova N., Staroverova V., Khanova A., Minvaleeva F., Gumova N., Bguasheva A., Makerova S., Shestakova E., Dragoy O. (Center for Language and Brain, HSE University, Moscow, Russia): *Developing a standardized assessment tool of text-level reading in primary school children*

12.30-13.00 Nikolina Runje (Faculty of Education and Rehabilitation Sciences, University of Zagreb, Croatia): *Independent sentence composition in beginner typical readers and readers with language disorder*

13.00-13.30 Mariña Siaba Rama, Bárbara Lorenzo Serrano & Silvia Martínez-Ferreiro (Faculty of Health Sciences, University of A Coruña, Spain): *Language deficits in a Spanish speaking child with Chronic Obstructive Pulmonary Disease*

13.30-14.30 LUNCH BREAK

14.30-15.30 PLENARY LECTURE – **Kasper Boye: Grammar and attention: From language perception to grammatical impairment (University of Copenhagen, Denmark)**

15.30-16.00 POSTER SESSION (Chair: Sabina Halupka-Rešetar) & COFFEE

Poster 01: Pamela Goryczka (University of Vienna, Austria): *Verb inflection impairments in Italian-speaking PWA: the view from Distributed Morphology*

Poster 02: Marwa Mekni Toujani (Higher Institute of Applied Languages and Computer Sciences of Beja, Jendouba University, Tunisia; "Langue et Formes Culturelles" Research Lab, Higher Institute of Languages, University of Carthage, Tunisia): *Big-Five Factors and Visual Attention in Picture Naming/Categorising Tasks*

Poster 03: Aleksandra Stanimirović, Vladislav Pančevački & Milica Popović Stijačić (FMK Lab, Laboratory of Psychological Research, Faculty of Media and Communications, Singidunum University; Department of Psychology, Faculty of Media and Communications, Singidunum University, Serbia): *Did tragic events from May 2023 affect the emotional experience of words?*

Poster 04: Milena Jakić Šimšić (SASA Institute for the Serbian Language, Serbia) and Maja Savić (Faculty of Philology, University of Belgrade, Serbia): *Spatial relations in Serbian*

Poster 05: Buse Karakaş, Ayşe Öykü Gündüz & Bilal Kırkıcı (Middle East Technical University, Ankara, Turkey): *A SNARC-Effect in Grammatical Number Processing in Turkish?*

Poster 06: Oana Niculescu (Romanian Academy Institute of Linguistics "Iorgu Iordan - Alexandru Rosetti", Bucharest, Romania): *Exploring the frequency distribution and temporal patterns of non-verbal vocalisations in Romanian monologue speech*

Poster 07: Kateryna Hordiienko & Zdeněk Joukl (Palacký University, Olomouc, Czech Republic): *Sentiment Analysis of two Slavic Cultures' Reactions to News Posts*

Poster 08: Regina Mezőlaki & Lívia Ivaskó (Developmental and Neuropragmatic Research Group, Department of General Linguistics, University of Szeged, Hungary): *Opening the umbrella term of faux pas: socio- and cognitive pragmatic approaches*

16.00-18.00 SESSION 3: (PSYCHO)LINGUISTICS (Chair: Srdjan Popov)

16.00-16.30 Bojana Ristić (University of Ljubljana, Slovenia), Karin Kavčić (University of Ljubljana, Slovenia), Rok Žaucer (University of Nova Gorica, Slovenia), Linnaea Stockall (Queen Mary University of London, UK), Christina Manoulidou (University of Ljubljana, Slovenia): *MEG evidence for semantic wellformedness evaluation of complex words in South Slavic*

16.30-17.00 Mariia Razguliaeva (Humboldt University, Berlin, Germany), Maria Onoeva (Charles University, Prague, Czech Republic), Kateřina Hrdinková (without affiliation), Radek Šimík (Charles University Prague, Czech Republic), Roland Meyer (Humboldt University, Berlin, Germany): *Processing of polar questions in Slavic: visual world paradigm*

17.00-17.30 Julija Kos & Christina Manouilidou (University of Ljubljana, Slovenia): *A psycholinguistic study of Slovenian taboo words: What makes taboo word a taboo?*

17.30-18.00 Katarina Chovancova (Matej Bel University, Banska Bystrica, Slovakia): *A contrastive insight on indexical elements in natural-language processing*

18.00 ROUND-UP

PLENARY LECTURE

Grammar and attention: From language perception to grammatical impairment

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In this talk I first outline a usage-based theory of what grammar is, and how it relates to attention. The basic claim is that the grammatical-lexical contrast represents a conventionalization of attentional prioritization such that grammatical elements are by convention background (discourse secondary) elements, whereas lexical elements by convention have the potential to be foreground (discourse primary) (Boye & Harder 2012; Boye 2023a, b).

Based on this outline, I present a number of recent psycho- and neurolinguistic studies in which we tested and found support for hypotheses derived from the theory. These studies suggest that grammatical signs come with a cost for speakers, but help hearers prioritize attention and thus save resources.

The theory also entails two mutually compatible ways of understanding the causes of grammatical impairment (including agrammatism) (Boye et al. 2023). According to one hypothesis, grammatical impairment is caused by an impaired neurocognitive capacity for combining simple signs into complex wholes; this impairment affects grammatical elements in particular as are discourse secondary and therefore depend on combination with other elements relative to which they can be secondary. According to the second hypothesis, grammatical impairment is the result of a compensation for resource reduction in which discourse primary elements are given priority at the cost of discourse secondary ones. I argue that neither of these two hypotheses can stand alone.

If time permits, I will end the talk by addressing challenges to existing theories of grammatical impairment posed by the first study of aphasia in a polysynthetic language (Nedergaard et al. 2019).

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WORKSHOP TALKS

Digital Markers of Dementia: Supporting Early Diagnostic of Alzheimer's Disease

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According to the latest report of Alzheimer's Disease International (Long, Benoist & Weidner 2023), nearly 55 million people worldwide are living with dementia. Dementia is a complex medical condition that involves a range of cognitive disorders affecting memory, speech, reasoning, and daily functioning. It is estimated by the World Health Organization that the number will triple by 2050, leading to an unbearable medical and socio-economical burden. However, there is a hope that timely diagnosis of dementia, early therapy treatments, and lifestyle changes can significantly postpone the further progression of the disease. In that vein, our research explores the capacities of Natural Language Processing techniques to contribute to the early detection of Alzheimer's Disease (AD), the most common form of dementia.

Natural Language Processing (NLP) is a subfield of artificial intelligence that provides resources and tools to model diverse language phenomena within a mathematical framework. As in most cases language is affected by AD, our research is based on modeling spontaneous speech by NLP algorithms and identifying digital markers that can be used as early predictors of the disease, telling apart AD and non-AD subjects. We used the recently created ADReSS Challenge (Luz, Haider, de la Fuente, Fromm & MacWhinney 2020) dataset, which provides speech recordings and transcripts of the Cookie Theft picture descriptions elicited from 78 non-AD and 78 AD subjects, often used as part of the Boston Diagnostic Aphasia Exam (Goodglass, Kaplan & Barresi 2001).

Our work was focused on transcripts as textual data and compared the effectiveness of two approaches of generating digital markers. The first approach involved predefined text feature extraction, wherein we utilized CLAN software (MacWhinney 2000) to extract a basic set of 34 language features such as the percentage of nouns or verbs, repetition rates, retracing, and others. We compared different classification methods based on these features, including decision trees, KNN, and support vector machines. SVM showed the best performance with 79% accuracy in 5-fold cross-validation.

In the second approach, we used the more complex language model to extract features from the transcripts, in the technical community known as BERT (Devlin, Ming-Wei, Kenton & Toutanova 2019): a 12-layer transformer-based pre-trained neural network. We added additional layers on the top of the BERT for our classification task and conducted two experiments to determine the better

approach for using the BERT model. We fine-tuned the entire BERT model in the first experiment, adjusting all its parameters to our classification task. In the second experiment, we froze the BERT parameters, keeping them unchanged, and focused on training only the additional layers we added for the classification task. Better results were obtained from the second experiment due to some technical challenges (preventing overfitting) we encountered during the first one. In order to add the level of interpretability to the model, in an additional experiment, we examined separate network layers to determine which representation, aka digital marker, gives better results since it is known within the NLP community (Tenney, Das & Pavlick 2019) that lower layers of a language model encode more morphology and syntax while higher layers capture more complex semantics. Lower layers demonstrated superior performance, and with the 5th layer, we achieved an 86% accuracy in 5-fold cross-validation.

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The comprehension of passive constructions in patients affected by Alzheimer's disease

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This study aimed to investigate the comprehension of different types of passive constructions in L1 Italian speakers affected by mild and moderate Alzheimer's disease (AD). The theoretical framework of reference is Generative Grammar and the passive structures tested are the ones with auxiliary *essere*, with auxiliary *venire* and with the *si*-causative construction. The idea of testing them is inspired by previous studies in L1 Italian acquisition. In particular, the *si*-causative passive appears to be the type of passive that children access first in their development and that they seem to privilege (Contemori & Belletti, 2013; Belletti & Chesi, 2014; Manetti & Belletti, 2015; Belletti & Manetti, 2019).

The thirty-six participants were divided into three groups (healthy controls, mild AD, moderate AD) exploiting the Mini-Mental State Examination (Magni et al., 1996). They were all tested using a sentence-picture matching task (one sentence, two pictures). The Corpus Anchise 320 (Benvenuti et al., 2020) was exploited to create both experimental (passive) and filler (active) sentences with properly chosen lexical items.

The statistical analysis was conducted using non-parametric tests in R. Passive sentences were significantly (p-value < 0.05) less comprehended by moderate AD participants compared to healthy controls. No significant difference was observed in the other pairwise comparisons. Individual analysis through contingent tables showed that the mild AD group comprehended passive sentences lower than the control group, but better than the moderate AD one. Within group, no significant difference emerged between active and passive sentences. A deeper analysis revealed no significant difference in the comprehension of *essere* and *venire* passives in any of the groups. The performance in passives dropped on moderate AD patients in the *si*-causative passive case. Additionally, a positive correlation was found between performance and severity of the disease.

It was concluded that, overall, AD patients are spared in the comprehension of passive constructions. The significant decrease in the performance of the moderate AD group may be attributed to typical cognitive deficits associated with the pathology, as observed in the mild AD group, together with linguistic impairments affecting the ability to compute more complex syntactic derivations.

This interpretation supports the hypothesis of the multifactorial nature of sentence processing in AD patients (Liu et al., 2019; Nasiri et al., 2022).

A reflection was made about the different behaviour of moderate AD patients and children towards the *si*-causative passive. The hypothesis is that this construction is not employed in the same way by young children and adults. AD patients are adults who lost at a stage of the pathology the ability to parse the construction tested because of certain elements that may cause it to be more complex (causative voice expressing causative meaning and reflexive *si* with its interpretation). Developing children, on the other hand, may actually use the *si*-causative construction during a phase of their development only to convey a passive meaning (with no causative and reflexive meaning, cfr. reflexive *si* as a route to passive hypothesis in Belletti, 2020).

Examples

(1) a. *La bambina è / viene vestita dalla nonna.*
         The girl is / comes dressed by the grandmother.

     b. *La bambina si fa vestire dalla nonna.*
         the girl *si*-cl makes dress by the grandmother
         The girl makes herself dress by the grandmother.

Figure 1. Percentage of target answers: active vs passive
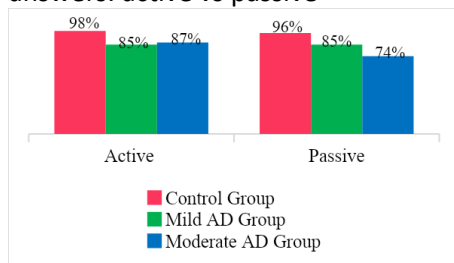
Figure 2. Percentage of target answers: different types of passive constructions
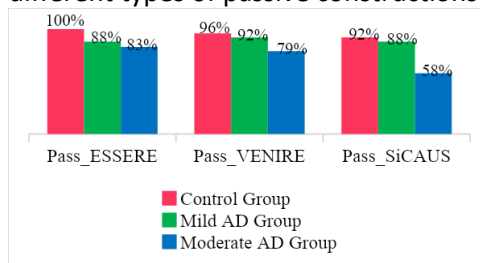
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Cohesion in cognitive decline: a study on a corpus of Italian elderly speakers

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This proposal outlines a methodology devised to define, objectify and automatically extract some parameters of cohesion for Italian language of elderly subjects. Among discourse properties, cohesion is manifested using cohesive devices which are elements used to create relations between different parts of text. Cohesion also plays a key role in enhancing the comprehension by an interlocutor, contributing to the creation of the meaning of the text as a unity (Halliday & Hasan, 1976). Cohesion and coherence, along with pragmatics seem to be linguistic features particularly susceptible to the effects of cognitive decline, even in its preclinical stages such as Mild Cognitive Impairment (MCI) (Petersen et al., 2014). Notably, deficits in discourse, characterized by vacuous and incoherent speech lacking informational value, may manifest prior to the onset of clinical pathology (Gagliardi & Tamburini, 2021). Hence, a thorough examination of discourse properties would contribute to advancing our understanding of subtle language disruptions resulting from cognitive impairment.

The analysis of cohesion that will be showcased focuses on some categories of cohesive devices, taking inspiration from studies conducted in other languages that compares the occurrences of different types of closed-class vs open-class words (Kim et al., 2019). Particularly, elements of reference, lexical substitution and connectives have been considered, and the parameters that have been defined are based on their frequency. A corpus of semi-spontaneous transcriptions of speech by Italian speakers affected by MCI, early dementia and healthy peers has been sourced for the measures designed. Although preliminary findings exhibit considerable variability, the frequency of certain elements (e.g. referential expressions) show some alterations in the verbal productions of impaired subjects compared to the control group. The study of the characterization of cohesion in language disruptions needs to be further explored, but it appears to be a promising avenue to begin expanding our understanding of discourse properties in cognitive decline.

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Development of the perceptual span in Russian-speaking children

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Introduction. Perceptual span is the amount of information that readers can perceive within one fixation (Rayner, 1975). It develops with age and reaches the size of 3 symbols to the left and 14 symbols to the right of the fixation point for skilled readers in alphabetical languages (Rayner, 2009). Our study is the first to assess the size of the perceptual span for Russian-speaking children and to investigate the effect of cognitive skills on it.

Method. The experiment involved 138 schoolchildren: 32-38 participants in grades 1-4. They read a set of sentences in a moving window eye-tracking paradigm (McConkie & Rayner, 1975). In this paradigm, the readers can see a predefined number of letters, whereas other letters are substituted with X-s. The window with visible letters moves along the sentence with the gaze. Thus, first-graders read 24 sentences in three conditions: 4_4 (4 characters visible to the left and right of the fixation), 7_7, and control (all letters were visible); second-graders – 36 sentences in conditions 4_4, 7_7, 10_10, and control; third-graders and fourth-graders – 48 sentences in conditions 7_7, 10_10, 14_14, and control. In addition to the eye-tracking experiment, each participant completed tests that assessed their reading fluency, attention, oculomotor, and syntactic processing skills, as well as their exposure to print.

Results. The size of the perceptual span was defined by the window condition in which the reading speed and the progressive saccade amplitude were close to those in the control condition of normal reading. We found that reading of first graders in window conditions with 4_4 or 7_7 visible characters was slower than the control condition ($p < 0.001$), indicating that seven characters to the right are not enough for undisturbed reading. Second graders' reading reached asymptote at 7_7 and was similar to the control condition ($p > 0.05$), so we concluded that their perceptual span consisted of seven characters to the right of the fixation point. Third-graders' and fourth-graders' reading in 10_10 and 14_14 conditions was close to reading in the control condition ($p > 0.05$) which allowed us to conclude that their perceptual span was approximately ten characters to the right. We also showed that in grades 1-3 none of the cognitive test results correlated with the perceptual span. In grade 4, we found an unexpected interaction between the attention skill and the 10_10 condition: better results in the attention test correlated with lower reading speed ($p = 0.02$).

Conclusion. Our findings showed that Russian-speaking children might have a larger perceptual span than their German-speaking peers (Sperlich et al., 2016). Unlike the results in other studies (Haikio et al., 2009), perceptual span was not associated with reading fluency. Contrary to our expectations, cognitive skills did not contribute to the perceptual span size in primary school.

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Complementizer omission in Gurbet Romani: a developmental perspective

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Theoretical background. Complementizers are typically defined as conjunctions that serve the function of identifying clauses as complements (Noonan 2007: 55) and have a range of semantic and pragmatic functions (Kehayov & Boye 2016). Among the semantic functions, complementizers may serve to distinguish propositional (truth-valued, indicative) complements from state-of-affairs (non-truth-valued, modal) complements. This semantic distinction is lexically marked in various varieties of the Romani language. The two most frequent Romani complementizers are the non-factual complementizer *te* and the factual complementizer *kaj*, used alongside some borrowed complementizers, such as *ke*; with optional complementizer omission (Matras & Tenser 2016), see Examples.

Aims. In this study, we explore complementizers in the Gurbet Romani (GR) variety spoken in Eastern Serbia. This variety is Balkanized to a certain extent, most notably in terms of infinitive loss and its replacement with finite complementation (Mirić & Ćirković 2022). This study aims to investigate whether there is a difference in the use of complementizers in GR from a developmental perspective.

Methodology. The data for the study are taken from the corpus of narratives in GR, recorded from 2016 to 2018. The corpus comprises samples of narratives from bilingual Romani-Serbian speakers: 12 adults (N=8,360 word tokens) and 20 elementary-school children (N=7,895 word tokens). The corpus was searched for all instances of matrix verbs (see List for output) selecting for complement clauses with used or omitted complementizers. The overall number of excerpted sentences is 97 (adults' sample) and 133 (children's sample).

In the analysis, the independent variable was age, with values: adults or children. The dependent variable was the complementizer, with values: used or omitted.

Results. The analysis reveals that the complementizer omission is possible but not frequent in GR (Figure 1), as it is observed in only 26.8% and 12% of sentences with complement clauses in adults' and children's samples, respectively. Complementizer omission is attested with modal verbs *mora* 'must', *našti* 'cannot', *šaj* 'can', but also with *džal* 'go', and *lel* 'take' selecting for subordinate clauses. All these verbs are used with the non-factual complementizer *te*, which suggests that only a non-factual complementizer can be omitted.

The statistical analysis indicates a significant difference between adults and children in the proportion of sentences with complementizer omission ($\chi 2=8.202$, $df=1$, $p=0.004$), with adults tending to omit complementizers more frequently than children (Figure 1). Additionally, the complementizer *ke*, which is borrowed from Romanian during previous phases of language contacts, is found only in the children's sample, used with the verb *phenel* 'say', which typically selects the factual complementizer *kaj*.

Discussion. The obtained results will be interpreted along the following lines:

a) Does optional complementizer omission develop later during the process of language acquisition and what motivates it?

b) Can the usage of the borrowed complementizer *ke* be regarded as an indication of potential language change, in terms of a more nuanced semantic specification of particular complementizers?

c) What are the implications of the obtained results for the analysis of Romani complementizers, in terms of attested matrix verbs, complementizer choice, complementizer omission, and clause structure?

Examples (Gurbet Romani)

(1) Non-factual complementizer *te*: 'We aren't allowed to do that.'

Ni	tromas	gova	**te**	ćeras.
NEG	be allowed.1PL	that	COMP	do.1PL

(2) Factual complementizer *kaj*: 'They think that we really speak German.'

Von	mislin	**kaj**	čače	nemački	pričos.
they	think.3PL	COMP	really	German	speak.1PL

(3) Borrowed complementizer *ke*: 'My girlfriend says that we are Serbs, not Roma.'

Mrni	drugarica	phenel	**ke**	amen	sam	Gadže	naj	sam	Roma.
my	girlfriend	say.3SG	COMP	we	be.1PL	non-Roma	NEG	be.1PL	

(4) Omitted complementizer: 'I cannot understand you.'

| Me	našti	Ø	razumiv	tumen.
I	cannot		understand.1SG	you.PL

List of excerpted matrix verbs:

ašunel 'hear', *bešel* 'sit', *dozvolil* 'allow', *džal* 'go', *džanav* 'know' / *džanav* 'know how', *kajil pe* 'regret', *kamel* 'want', *lel* 'take', *mangel* 'want, wish', *mislil* 'think', *mora* 'must, have to', *mothol* 'say, speak', *najavil* 'announce', *našti* 'cannot',

phenel 'tell', *šaj* 'can', *sićol* 'learn', *tromal* 'be allowed to', *trubul* 'should', *učil* 'learn', *vaćarel* 'tell', *volil* 'like'.

Figure 1. Relative frequency of the complementizer use and omission in Gurbet Romani
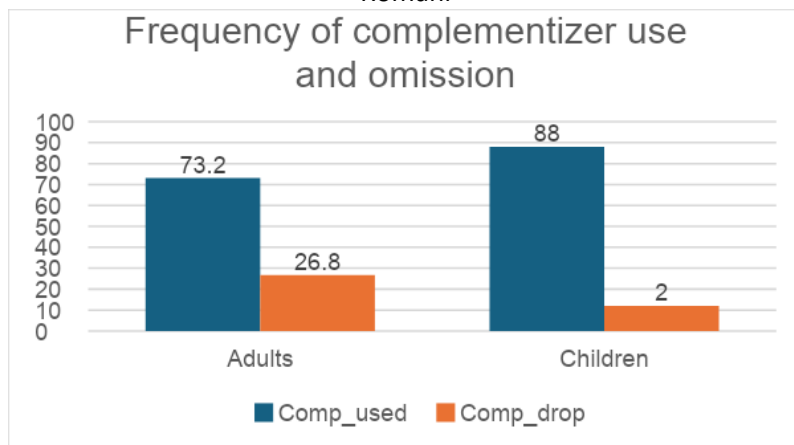
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Developing a standardized assessment tool of text-level reading in primary school children:
transferring worldwide practices to understudied and minority languages

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Introduction: The reading skills assessment in primary school children in many languages remains nowadays non-standardized, or it is limited to word-level reading. Considering the proven importance of text-level reading assessment in dyslexia diagnosis (Meisinger et al., 2021), the present study develops a new text-level reading assessment tool in primary school children in three languages of Russia: Russian (a majority Slavic language), Tatar (a minority Turkic language), and Adyghe (a minority Northwest Caucasian language). We report approbation results collected in 333 Russian-speaking children and discuss some universal and language-specific issues of text-level reading assessment tools.

Methods: A new text-level reading assessment tool is largely based on its English (Woodcock & Johnson, 1990; Wiederholt & Bryant, 2012) and Russian (SARS, Kornev, 1997) predecessors that measure both reading fluency and reading comprehension. Importantly, reading materials of the new test are controlled for a range of psycholinguistics parameters (upon their availability) such as average word length, average sentence length, average word frequency, lexical diversity, lexical and structural complexity (see Table 1). Moreover, the test has a tablet-based version that displays texts in sans-serif Arial font (see Rello & Baeza-Yates, 2013), font size 20 pt, light-yellow background color #EDD1B0 (see Yoliando, 2020).

Reading data from the new Russian test were collected in 333 Russian monolingual children from grades 1-4 (186 girls, Mean age = 8.74 y.o., SD = 1.2, age range 6-11 y.o.). All of them demonstrated normative results in a non-verbal intelligence test (Raven, 2004) and in SARS that was used as a baseline for a typically developing reading. Children read either both texts from tablet (171) or both from paper (113), 49 children took part in a within-subject experimental design switching between tablet and paper versions.

Results and Discussion: For the Russian test, a linear mixed effects model in 49 children demonstrated no difference in reading fluency and comprehension (both p > 0.5) between paper-based and tablet-based reading. Another linear mixed effects model in 284 children demonstrated a significant effect of text across all

grades (p <0.001) in reading fluency but not in reading comprehension. These findings made us conclude that the used display features ensure comparability of paper and tablet versions and are recommended for further development of digital reading tools. However, texts should probably be controlled for other psycholinguistic features that might affect reading ease despite a comparable text complexity.

The development of Tatar and Adyghe reading tests revealed a lack of automated resources and/or sufficient corpora leading to a great deal of manual work and limitations in texts' psycholinguistic appropriateness. This advocates a greater attention to the development of other psycholinguistic tools in minority languages. Furthermore, a discussion of readability measures in languages different from English is raised, as the commonly used Flesh reading ease formula showed itself insufficient for agglutinative Tatar language and polysynthetic Adyghe language. Their negative scores (i.e. highly difficult texts) should be attained for language specificity rather than actual text complexity, as the texts were selected by native schoolteachers from age-appropriate books.

Table 1. Texts complexity across three languages

	Russian		Tatar		Adyghe	
	Text 1	Text 2	Text 1	Text 2	Text 1	Text 2
Word count	205	205	191	126	128	134
Sentence count	26	19	20	13	15	16
Average frequency of content words, ipm	981.1	1276.0	tba	tba	tba	tba
Average length of content words, letters	6.3	6.4	5.55	5.9	6.5	6.6
Average sentence length, words	9.2	12	9.55	9.7	8.7	8.4
Lexical diversity	0.52	0.64	0.49	0.61	0.74	0.83
Flesch Reading Ease (up to 100)	65	61	-2.62	-11.5	-19.03	-25.4
Structural complexity FRE(Oborneva)	4/10	4/10	4/10	3/10	2/10	2/10

Note: A set of two texts is unique in each language test.

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Independent sentence composition in beginner typical readers and readers with language disorder in Croatian

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Early schooling is characterised by learning to read and write. In the Croatian education system, the first two grades are dedicated to these basic skills, which are crucial for further academic development. Children who enter the education system with a language disorder (LD) find it particularly difficult to navigate school, as they primarily have difficulties with language comprehension and spoken language production (Bishop et al., 2017). Studies of school-age LD children show that their difficulties very often extend to reading (Catts et al., 2005) and writing (Bishop & Clarkson, 2003), i.e. on two language skills that are important for academic success in higher grades. The meta-analysis by Ziegenfusz et al. (2022) has shown that the academic achievement of LD children hasn't been thoroughly studied and that there is a lack of systematicity in the research of reading and writing in LD children. In addition, research in this area has so far focused mainly on reading, while the writing skills of LD children have been understudied in comparison (Andreou & Aslanoglou, 2022). However, studies have shown that LD children exhibit difficulties with written production and quality, morphological accuracy, and spelling (Dockrell et al., 2007; 2009; Koutsoftas & Gray, 2012; Kuvač Kraljević et al., 2022; Stuart et al., 2020).

The aim of this study was to investigate the writing skills of Croatian speaking children with typical language and reading skills and children with reading and language difficulties. Specific questions addressed in the study were as follows: 1) Are there significant differences between typically developing (TD) children and children with reading and language difficulties (R/LD) with respect to independent sentence composition (ISC)?; 2) Which components of ISC are the most affected in R/LD children?; 3) What is the contribution of language comprehension, reading skills and phonological skills to the different components of ISC?

The total sample consisted of 72 second grade children (53% F, 47% M; Mage=8;10) attending mainstream schools and divided into TD and R/LD groups based on the results of spoken language comprehension, phonological awareness and reading tasks from the *Test of beginning reading and writing* (Kuvač Kraljević & Lenček, in press.). Several aspects of writing have been assessed using the ISC task: 1) spelling defined as accuracy of written words (AWW), 2) adherence to

writing conventions, measured through accurate use of punctuation and capitalization (AWC-P & AWC-C) and 3) independent sentence composition quality at semantic and morphosyntactic levels (ISC-SQ & ISC-MSQ). For all variables the maximum score was 6.

The preliminary results show that R/LD children achieve significantly lower results in all writing components: AWW (t=4.881, df=67, p<0.001), AWC-P (t=3.787, df=70, p<0.001), AWC-C (t=3.941, df=70, p<0.001), ISC-SQ (t=3.447, df=70, p<0.001) and ISC-MSQ (t=4.744, df=70, p<0.001). Furthermore, R/LD children achieve lowest scores in AWC-C (M=3.97, SD=2.646) and AWC-P (M=4.09, SD=2.563). The results also show significant correlations between language comprehension, phonological and reading skills and all the measured ISC components. Language comprehension, phonological and reading skills explain up to 30 % of variance in ISC-MSQ and AWW. These findings provide opportunities for further analyses and show the need for a systematic approach to writing research and intervention, and thus have important theoretical and clinical implications.

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Language deficits in a Spanish speaking child with Chronic Obstructive Pulmonary Disease

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According to the WHO, chronic obstructive pulmonary disease (COPD) is an incurable lung disease that reduces airflow and causes breathing problems. Despite increased phonatory resistance in COPD patients, airflow reduction has been consistently associated with speech distortions such as those resulting from reduced maximum phonation time and phonatory efficiency. Although voice changes and dysphonia are not direct symptoms of COPD, they also tend to co-occur as a result of a functional adaptation to the decreased airflow (Hassan et al., 2018). Less is known about the potential effect of COPD in language production. Ortapamuk and Naldoken (2006) report spared performance in verbal fluency and sentence construction tests in 18 patients with hypoxemic and non-hypoxemic COPD. However, based on the results of 100 COPD Greek-speaking patients, Makanikas et al. (2019) concluded that, whereas overall performance was within normal range, it was significantly lower in semantic language tests.

In this presentation, we aim to delve deeper into language deficits in COPD. To fulfill this aim, we explored the linguistic abilities of two 6-year-old Spanish speaking twins, one with and one without COPD (henceforth, S01 and S02 respectively), using the *Peabody picture vocabulary test* (PPVT-III; 1997) and semi-spontaneous speech samples. The analysis of the PPVT-III results showed average performance for both subjects, with good receptive vocabulary. However, lexical diversity was found to be lower than average in S01 (with an index of 0.35), whereas the performance of S02 fell within normality (0.5). The examination of the spontaneous speech samples further confirmed this pattern.

In line with Makanikas et al. (2019), this study corroborates the existence of problems associated to the access and/or retrieval of lexico/semantic representations in the absence of generalized problems in COPD patients. It also shows that a-priori unrelated conditions may have an impact on language performance. This is especially relevant in the case of children, given the potential cascade effects on language acquisition.

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MEG evidence for semantic wellformedness evaluation of complex words in South Slavic

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Previous studies suggest that semantic well-formedness of stem+affix combinations is evaluated between 300 and 500 ms in the left orbitofrontal cortex (OF). Using pseudoword paradigm with Greek suffixes, Neophytou et al. (2018) showed more activation in the OF in the 300-500 ms window for the pseudowords violating verb argument structure (in comparison to those violating stem category), while Stockall et al. (2019) found similar results only with some English prefixes. The distinction was also found behaviorally, with semantic violations eliciting longer reaction times (RTs) and lower accuracy in lexical decision tasks (Manouilidou & Stockall, 2014). However, with evidence coming from argument structure violations only, it's not clear whether this process relates to semantic information other than argument structure. We created 2 experiments with equivalent designs in Slovenian and Bosnian-Croatian-Serbian (BCS). To create semantic violation pseudowords (SemViol), we attached 3 prefixes that are equivalent in Slovenian and BCS (*raz, od, vz/uz*) to state verbs that were previously rated as stable/durative (BSC *razboraviti* "raz-dwell"), and compared them to the category violation pseudowords (CatViol) where the same prefixes were attached to nouns (BCS *razmajka* "raz-mother"). This way, we manipulated a purely semantic wellformedness restriction.

A total of 16 Slovenian and 23 BCS native speakers performed lexical decision tasks with the concurrent MEG recordings. We extracted 600 ms epochs for each stimulus, and conducted spatio-temporal 2 (SemViol, CatViol) x 3 (Raz, Od, Vz/Uz) ANOVAs in the left OF, in the 300-500 ms time window, in line with Neophytou et al. (2018) and Stockall et al. (2019). Additionally, to address the strength of the restrictiveness of the semantic manipulation, we ran a separate 2x1 ANOVA, where we compared SemViol items to the grammatical words containing the three prefixes, in the same region and time window.

Mirroring the previous studies, the behavioral results showed that SemViol items for all prefixes elicited less accurate and slower responses than CatViol items, and than Gramm items (all *ps*<.001, Figures 1&2). The MEG analyses showed significant clusters of increased activity for SemViol items (compared to CatViol items) in the left OF, in the expected time window, although the cluster in BCS

(p=.03, Figure 4) was later than the one in Slovenian (p=.02, Figure 3), and although differences between prefixes emerged (as in Stockall et al., 2019). Interestingly, for this region and time window, there were no significant differences in the brain activity between SemViol items and the grammatical items, in neither language.

Our results confirm involvement of the OF in the processes related to semantic well-formedness in morphologically complex words, in a design that relies on a purely semantic rule, in two closely related South Slavic languages. We discuss the possibility that the semantic well-formedness evaluation proceeds similarly for the ill-formed and well-formed items in this region and time window (provided the category well-formedness is respected), and that the rejection of the ill-formed pseudowords might occur independently. We also discuss the potential reasons for by-prefix differences.
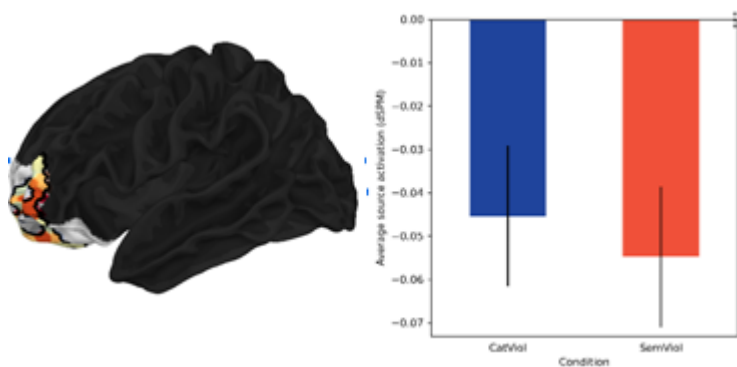
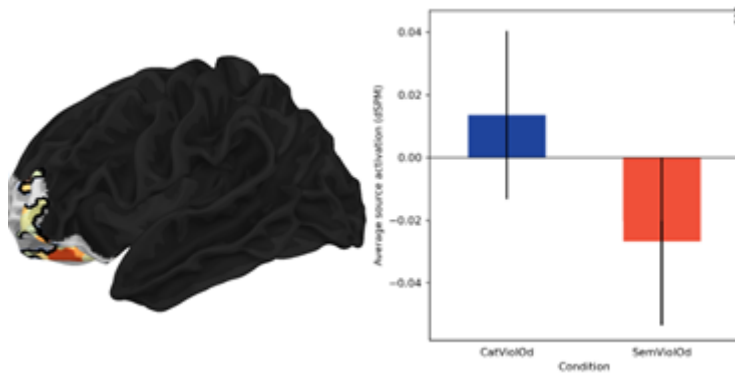**Figure 1.** Accuracy data for Slovenian (above) and BCS (below)
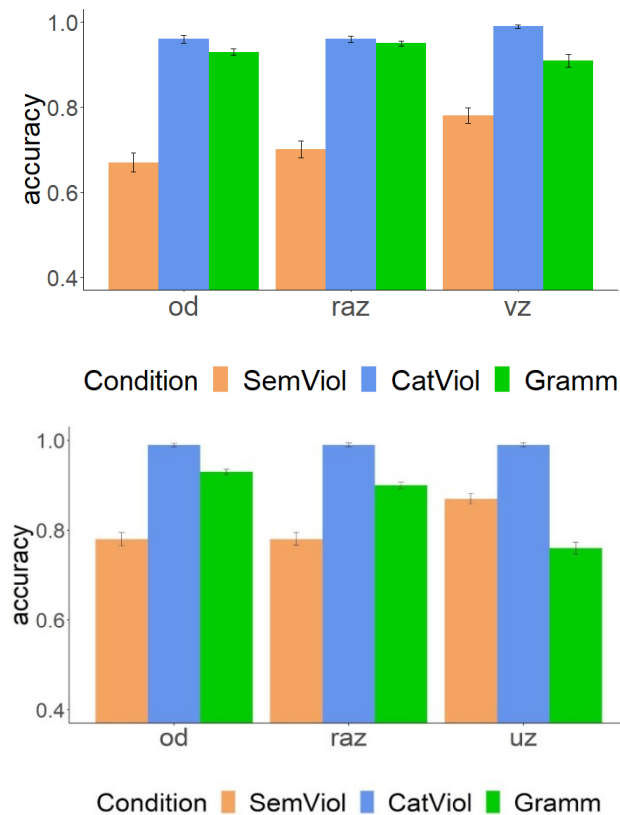
Figure 2. Reaction time data for Slovenian (above) and BCS (below)
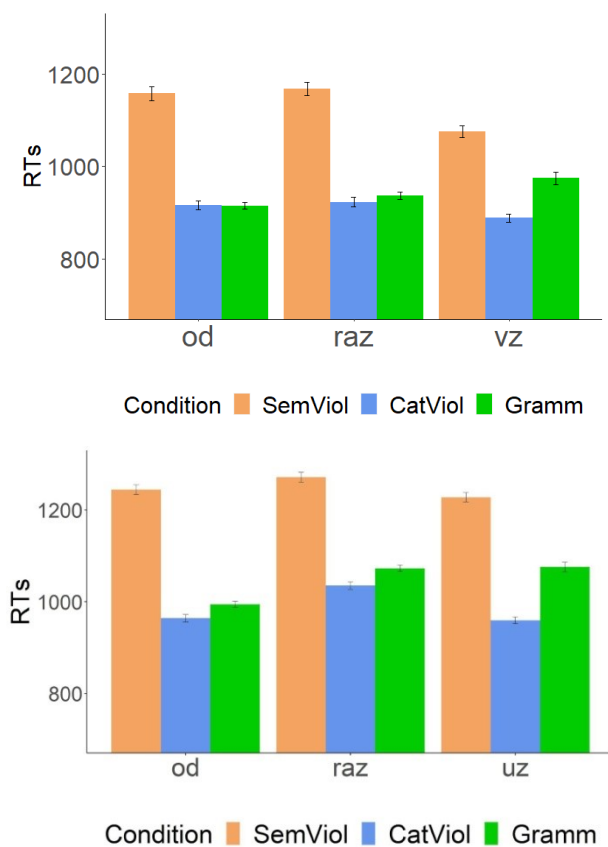
Figure 3. The significant cluster in Slovenian, 350-30 ms (p=.02), left orbitofrontal cortex

Figure 4. The significant cluster in BCS, 440-470 ms (p=.03), left orbitofrontal cortex

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Processing of polar questions in Slavic: visual world paradigm

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The denotation of yes/no questions, or polar questions (PQs), is a highly debated topic in semantics. In the traditional analysis (Hamblin 1973), a PQ like *Is it raining?* denotes the set {it is raining, it is not raining}, or {p, $\neg p$} with p = {it is raining}. Abels (2007) and Biezma & Rawlins (2012) propose a singleton-based analysis in which only the proposition overtly expressed in a PQ belongs to its semantic meaning.

This eye-tracking study examines the processing of PQs from the perspective of their denotation. Building on Tian et al.'s (2016, 2021) work on English and French, it compares Russian and Czech PQs with SVO word order to analogous assertions. We aimed to determine if the participants would fixate more on the image depicting p or $\neg p$ while listening to PQs and assertions. For assertions, we expected more fixations on the image corresponding to their polarity. For questions, Hamblin-style analysis predicts a balanced distribution of looks between p and $\neg p$, while the singleton-based analysis predicts an assertion-like pattern.

The analysis includes two predictors. Force (question vs. assertion) was manipulated between items and polarity (affirmative vs. negative) was manipulated within items. The dependent variable was the log ratio of the proportion of looks to the positive (> 0) over negative (< 0) image (Ito & Knoeferle 2023). All stimuli were prerecorded dialogues consisting of the target utterance, a 1s gap, and a brief response (see Ex. 1 and 2). While listening to the auditory stimulus, participants saw four pictures on a screen: p, $\neg p$, and two distractors (see Fig. 1 and 2). We tracked the eye movements of 51 native speakers of Russian and 48 of Czech.

Fig. 3 shows the preliminary results. Linear mixed models were fitted to the data for the 6 interest periods with random intercepts for items and participants. Assertions favored looks to the picture corresponding to their polarity, consistent with the hypothesis. There was a main effect of polarity in the gap region of assertions in Czech (t = −2.855, p = .006) and Russian (t = −3.577, p < .001). PQs tended towards the positive picture, even if their polarity was negative. There was a main effect of force in the O (t = 3.798, p < .001) and gap (t = 3.014, p = .003) regions in Czech, and in the Adv (t = 2.980, p = .003) and gap (t = 2.137, p = .033) regions in Russian – i.e., PQs instigated more looks to the positive picture

than assertions. Our findings align with the pattern detected by Tian et al. (2021). We find no straightforward evidence for the Hamblin or singleton-based analysis. Instead, the processing of PQs is mostly accompanied by fixations on the positive image (in both affirmative and negative PQs), suggesting the dominance of positive epistemic bias – a preference for the positive answer based on the speaker's beliefs (Büring & Gunlogson 2000; Romero & Han 2004; Sudo 2013; Goodhue 2022).

(1) **Example of question stimuli** (Czech)

    A: Jarka (ne-) oloupala ráno   banán?
      Jarka NEG peel   morning banana
      'Jarka (didn't) peel banana in the morning?' B: Já myslím, že ano / ne.
      I   think   that yes no
   'I think she did / didn't.'

Example of assertion stimuli (Russian)

A: Anja (ne-) otkryla v kafe knigu.
   Anja NEG open   in cafe book
 'Anja (didn't) open (the) book in the cafe.' B: Ja dumaju, čto da / net.
   I think   that yes no
  'I think she did / didn't.'

Figure 1. Example of visual stimuli for (1)

Figure 2. Example of visual stimuli for (2)

Figure 3. Average progression of the DV (natural logarithm of the fixation proportions of *p* over ¬*p*), normalized for time. Interest period boundaries are offset by 200 ms.
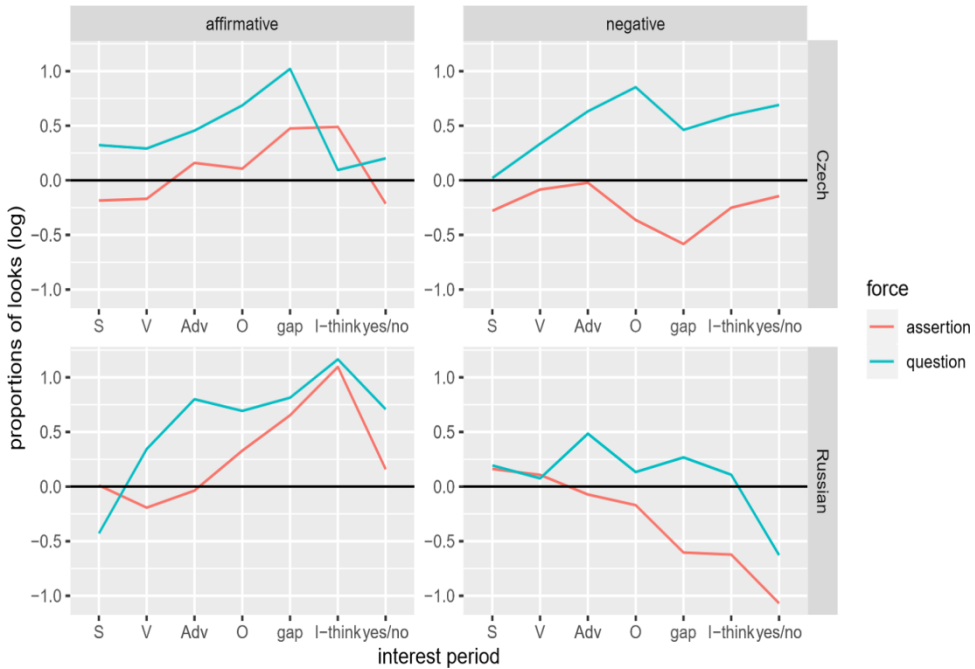
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A psycholinguistic study of Slovenian taboo words: What makes taboo word a taboo?

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Background: Taboos, defined as prohibited topics and behaviors (Merriam-Webster, n.d.), vary across societies and cultures. Despite the ubiquity of taboo words in everyday language, we do not know much about Slovenian taboo words, as most of the studies are done on English-speaking population. The ongoing ambiguity regarding specific categories of taboo words (Jay, 2009; Stapleton, 2010) underscores the necessity for comprehensive research in this domain. Based on findings of Nežmah (2011), the origin of Slovenian taboo words can be attributed to Slavic and German origin, however, we hypothesized that more recent taboo words also originate from English because of globalization. Additionally, based on Nežmah (2011), we expected a high number of taboo words with sexual reference, insults, and slurs, and taboo words being defined by high arousal, tabooness, offensiveness, concreteness, age of acquisition, and negative valency, based on current findings (Jay & Jay, 2015; Stapleton, 2023).

This study aims to collect Slovenian taboo words, categorize them, explore foreign cultural influences, and determine which properties define taboo words for a larger international project "Towards a Cross-linguistic Database of Taboo Words." We chose to compare variables that include: tabooness, arousal, offensiveness, concreteness, age of acquisition, and valency together with frequency in the corpus (slTenTen).

Methodology: In Part 1, we asked 43 participants (mean age = 21.72, *SD* = 2.49) to write down all taboo words they can think of without self-censorship. From their responses, we extracted Slovenian taboo words (252 items), following the definition by the standard dictionary and personal judgment. We compared origins of the most frequent lexical items and categorized all the words we collected. In Part 2, we conducted an experiment with the obtained taboo words and neutral fillers (125 items) to gather ratings using the best-worst scaling technique from 42 participants (mean age = 22.13, *SD* = 3.57) on different dimensions of taboo words, namely, tabooness, arousal, offensiveness, concreteness, age of acquisition, and valency. We calculated correlations between these dimensions and word frequencies in the corpus and the obtained list of taboo words (see Table 1).

Results and discussion: Early analyses of words from Part 1 (see Figure 1) shows a similarity to Slavic languages with a strong influence of foreign English-speaking cultures and predominance of words with sexual references, insults, and slurs.

Part 2 shows positive correlations between different dimensions and frequencies (see Table 1), which indicate a tendency to acquire the most tabooed and the most arousing words later in life, heightened arousal of tabooed words, as well as heightened tabooness and arousal of offensive words. Negative correlations, on the other hand, indicate that tabooed and offensive words are not pleasant, that we acquire concrete, unpleasant and uncommon words later in life, and that the frequency of tabooed and offensive words diminishes in the corpus.

Figure 1. The Most Frequent Words and Number of Occurrences

Table 1. Correlations Between Five Semantic Dimensions, Age of Acquisition, and Frequency in the Corpus

Measure	1	2	3	4	5	6
1. Age of Acquisition	—					
2. Arousal	**.43**	—				
3. Concreteness	**-.34**	-.01	—			
4. Valency	**-.34**	-.36	.15	—		
5. Tabooness	**.60**	**.69**	-.04	**-.55**	—	
6. Offensiveness	.28	**.37**	-.23	**-.74**	**.57**	—
7. Frequency in corpus	**-.36**	-.18	.37	.32	**-.27**	**-.36**

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A contrastive insight on indexical elements in natural-language processing

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Context-bound indexical elements (Benveniste 1966; Kerbrat-Orecchioni 2002; Txuss & Hinzen 2014) act as potential sources of ambiguity in human communication. If ambiguity arises from the absence of contextual (situational or co-textual) cues in a synchronous face-to-face interaction it can be solved by an increased cooperative effort of speakers (Dausendschon-Gay 2003; Felicia & Rodica 2013). The same is true if the interaction is multilingual. In that case, co-construction of meaning can be facilitated by speakers with plural linguistic repertoires. Accordingly, it can be supposed that in language processing, indexical elements might induce potential deficiencies in language corpora construction and in AI-assisted translation.

The paper puts forward results of a survey conducted upon parallel corpora consisting of three sets of segments containing context-bound pronominal elements taken from press communications published in Slovak and in French electronic media in 2022. The three data sets were obtained in the process of an AI-translation by three different translating tools (Google Translate, Deepl and Reverso). The main focus is on the ways the selected context-bound elements of pronominal nature (distinguishing between personal and demonstrative pronominal references), are treated by different tools. Individual cases are assessed in an oriented contrastive perspective (Slovak to English and Slovak to French language pairs, and French to Slovak and French to English language pairs). Contexts are assessed with regards to the degree of equivalency of analyzed elements, providing quantitative and qualitative assessment of this key variable.

According to the initial hypothesis, 3rd person personal pronouns show the lowest degree of equivalency in AI-assisted translation than 1st and 2nd person pronominal references, followed by demonstrative elements. This assumption has been confirmed in language pairs with Slovak as source language and English or French as target languages while it has been infirmed for language pairs with French as source language and English or Slovak as target languages. Still, in terms of transparency vs opacity the functioning of pronouns in written communication differs from when they appear in oral interactional events. Partial validity of the original hypothesis is explained by typological features of languages under focus and a more subtle analysis of the categorial properties of pronominal indexicals is provided. The impact of the research conducted can be

sought in a deeper knowledge of linguistic systems that might prove to be useful in searching for an improved design and training of AI-based translation tools.

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POSTER PRESENTATIONS

Verb inflection impairments in Italian-speaking PWA:
the view from Distributed Morphology

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Synopsis. This paper proposes an analysis of subject-verb agreement errors in Italian non-fluent aphasia couched in the framework of Distributed Morphology (DM). Drawing on Pfau's (2009) study on speech errors in typical populations, we argue that a language production model which incorporates DM allows for a more concise account of the observed impairment patterns.

Background. Verb inflection impairments are well documented cross-linguistically from a generative perspective (e.g., Friedmann & Grodzinsky 1997, Bastiaanse & Thompson 2003, Martínez-Ferreiro 2010). For Italian, previous studies have reported a high degree of speaker variation in the omission and substitution of grammatical morphemes, difficulties in producing phraseological auxiliaries, impoverished use of modal and reflexive verbs, as well as a deficit in producing complex verb-argument structures (Miceli et al. 1983, Miceli & Mazzucchi 1989, Chinellato 2002, Rossi & Bastiaanse 2008). It has also been argued that tense deficits prevail over agreement errors, and that within agreement errors singular forms are usually preferred over plural ones (e.g., Garraffa 2011)

Methodology. We examined the inflectional productions of three agrammatic subjects (Tab. 1) in a sentence completion task with alternating tense and person specifications (Friedmann & Grodzinsky 1997). Participants were exposed to a complete sentence with a clause initial temporal adverbial and then to an incomplete sentence. The incomplete sentence was a partial repetition of the complete sentence, but with either a different initial temporal adverbial in order to trigger a change in tense, or with a different subject as to induce a change in subject-verb (person and number) agreement. The task included 96 critical sentences (144 in total).

Results & Discussion. As seen in Tab. 2, ER shows slightly better performance with person changes (27% correct) than with number changes (18% correct). SI performs well in both person and number alternations, achieving 68% and 64% accuracy, respectively. VE excels, with 81% and 89% correct verb forms. ER and SI did not manage to carry out the tasks concerning Tense modification; VE achieves 50% accuracy in tense/person changes and 73% in tense/number changes. These quantitative results align with prior studies, affirming the impact of aphasia type and severity on performance variations.

Notably, consistent error patterns emerge across subjects, transcending aphasia type and severity distinctions. Examination of these errors reveals two distinct

groups: those stemming from the manipulation of morphosyntactic features (e.g., favoring singular over plural, 1SG over 3SG), and those involving post-error repair strategies (e.g., overgeneralization of the theme vowel -*a*- to verbs outside the first conjugation), cf. (1). Pfau's (2009) hybrid model, integrating components of Levelt's (1989) production model and DM (List 1, List 2), accommodates all encountered inflection errors (Fig. 1). Semantic substitutions emerge before accessing List 1, while tense selection occurs within List 1, with manipulation or modification during the early stages of grammatical encoding in the Formulator (prior to potential morphosyntactic structure alterations). Erroneous morphosyntactic feature copies/shifts occur in the Formulator's component encoding morphosyntactic structure. Currently, we suggest localizing overgeneralizations in the model's lower component, dedicated to the phonological encoding of the verb.

(1) Selection of errors found in our data

    a. La bambina dorma a lungo. 'The girl sleeps in.'
        (Overgeneralization of theme vowel -*a*-: *dorma* instead of *dorme)*
    b. Il portinaio prendono le chiavi. 'The doorman take(s) the keys'
        (Number feature mismatch: *prendono* instead of *prende)*
    c. La commessa regala fragole. 'The saleswoman gives away strawberries.'
        (Semantic substitution: *regala* instead of *vende* 'sells')
    d. La donna aveva un gatto. 'The woman had a cat'
   (Tense shift: imperfect *aveva* instead of present tense *has*)

Table 1. Background information on experimental subjects (ER, SI, VE) and control participant (C1)

ID	Gender/Age	Education	Region (origin/residence)	Etiology	TPO	Aphasia (severity)
ER	f/60	Middle School (4 years)	Emilia-Romagna	Ischemic CVA	2	Global aphasia (moderate)
SI	m/48	(Technical) Middle School (4 years)	Sicily	Ischemic CVA	2.3	Broca aphasia (moderate-severe)
VE	m/61	Middle School (3 years)	Veneto	Ischemic CVA	2.5	Broca aphasia (mild-moderate)
C1	f/62	Middle School (4 years)	Emilia-Romagna	-	-	-

Table 2. Absolute and relative numbers of correct verb inflection production

ID	Sentence completion (Alternation: 1SG>3SG)	Sentence completion (Alternation: 3SG>3PL)	Sentence completion (Tense: 1SG>3SG; 3SG>3PL)
ER	6/24 (= 27% correct)	4/24 (= 18% correct)	-
SI	16/24 (= 68% correct)	15/24 (= 64% correct)	-
VE	19/24 (= 81% correct)	21/24 (= 89% correct)	12/24 (= 50% correct); 7/24 (= 73% correct)
C1	24/24 (= 100% correct)	24/24 (= 100 correct)	24/24 (= 100% correct); 24/24 (= 100% correct)

Figure 1. Localization of selected errors in model of DM combined with Levelt's language production model (cf. Pfau 2009)
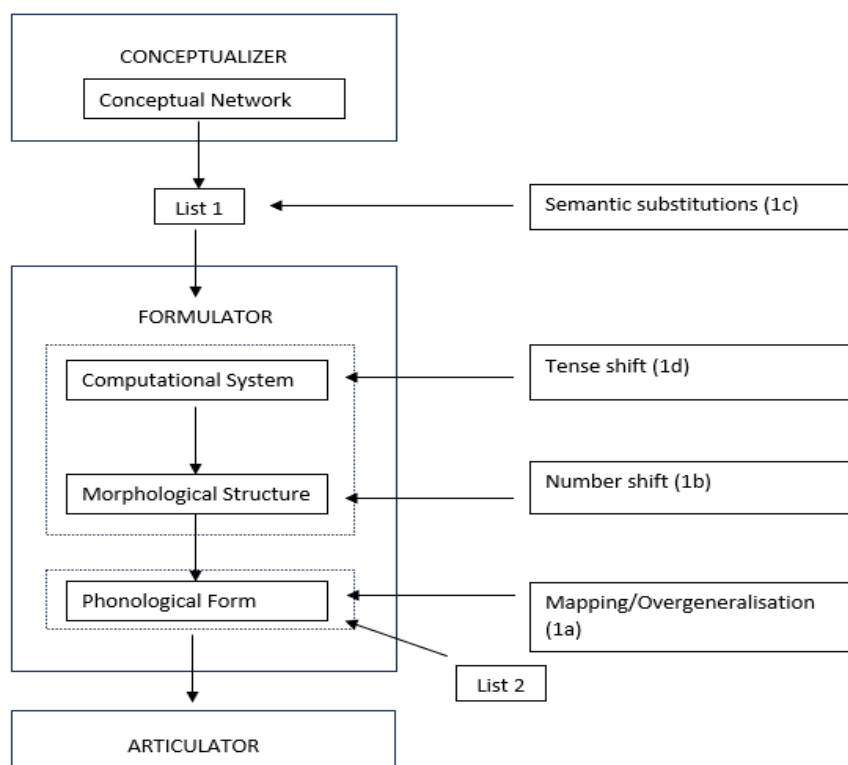
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Big-Five Factors and Visual Attention in Picture Naming/Categorising Tasks

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This study investigated the effects of individual differences (i.e., personality traits) and task demands (categorising and naming) on visual selective attention. The visual selective attention of 64 Dutch participants was assessed using eye-tracking. Their personality traits were measured using the Big-Five model (BFI-2-S). Results indicated that higher degrees of extraversion, open-mindedness and agreeableness affect visual selective attention. That is, more extravert, more open-minded and more agreeable people could be more distracted by their partners' pictures more than more conscientious as well as more negative emotional people are. Those who have more degrees of the latter personality traits selectively attend to their own pictures and overlook their partners'. Thus, this study contributed to the bunch of studies investigating the effect of individual differences on cognitive processing demonstrating that some personality traits could affect selective visual attention in picture naming/categorising tasks.

Did the tragic events from May 2023 affect the emotional experience of words?

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The influence of context on the emotional experience of words, defined through emotional valence (EV) and arousal (AR), is increasingly being explored within psycholinguistics. For instance, Delatorre et al. (2019) showed that under conditions of uncertainty, AR increases for negative terms while decreasing for positive ones compared to a "normal" situation. A similar was observed in a Serbian study of the data collected during and after the COVID-19 pandemic (Popović Stijačić et al., 2023). The Serbian citizens experienced the natural situation of uncertainty in May 2023, when a tragic shooting occurred in a primary school, followed by multiple homicides in the vicinity the next day. In this research, we aimed to explore whether there was a change in the emotional experience of words following these events, knowing that they caused a high level of concern among the Serbian population. We collected EV and AR ratings two weeks after the May events. We compared them with those collected during February (regular rating conditions) and March 2023 (rating after the induction of positive and negative emotions; Stanimirović et al., accepted for presentation).

Sixty-one psychology students (M=24.6) rated EV and AR for 450 Serbian nouns (Popović Stijačić et al., 2023). Afterward, participants estimated their mood over the past ten days (DASS-21) and concern regarding socio-political events (war in Ukraine, Coronavirus, school shootings, and events in Mladenovac). Using repeated measures ANOVA, we compared EV and AR ratings recorded after the May events with those from a previous study (Stanimirović et al., 2023). Additionally, we used word category as a between-subjects factor, dividing words based on EV into positive, neutral, and negative categories. This approach aimed to ascertain which word group experienced emotional valence and arousal changes.

In by-stimuli analyses, the main effect of measurement point was observed for EV ratings (F(3, 1341)=21.35, p<.001), and the interaction effect with the word categories (F(6,1341)=11.61, p<.001; Figure 1, left panel). Post hoc analysis revealed significant differences only for the category of positive words - ratings after the May events were significantly lower compared to February and March 2023 measurements, where positive emotions were induced. For AR ratings, there were also main effects of measurement point (F(3, 1341)=22.43, p<.001)

and the interaction (F(6,1341)=13.08, p<.001; Figure 1, right panel). Post hoc analysis showed that ratings after the May events were significantly higher than those during the imagination of positive events. Differences were also noted for the positive word group (the May ratings were significantly higher than those after the induction of positive emotions). In by-participant analyses, we examined correlations between EV and AR ratings and participants' distress related to situational factors (Table 1). Those who were more concerned about the school shooting and events in Mladenovac gave lower EV ratings. Conversely, those more concerned about events in Mladenovac and the Ukranian war gave higher AR ratings.

Results indicate that negative contextual factors alter the EV of positive words - participants give lower ratings when under stress. Conversely, they give higher AR ratings, particularly for neutral and positive words. This finding contrasts with previous research (Popović Stijačić et al., 2023), showing decreased AR due to negative contextual factors.

Figure 1. Mean estimates of Emotional valence and arousal by measurement point and by emotional valence word category
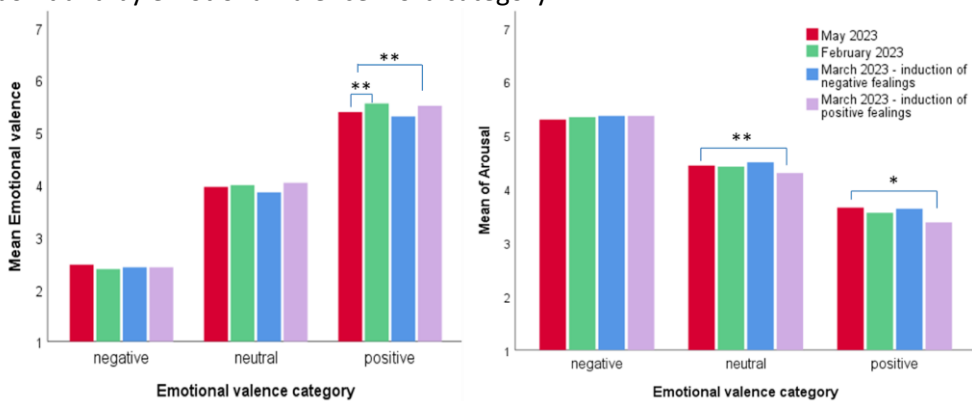
Notes: ** - significant mean difference with Bonferroni correction p<.001; * significant mean difference with Bonferroni correction p<.05

Table 1. Intercorrelations of the estimates of the Emotional valence and Arousal and levels of anxiety due to different situational factors (by participants analysis)

	Situational factors - levels of anxiety due to the event					
	Anxiety during Quarantine	Anxiety due to COVID in the last 7 days	Anxiety due to the Ukrainian War	Anxiety due to exams	Anxiety due to school shooting	Anxiety due to the shooting in Mladenovac
Emotional valence	-.219	.234	-.176	-.220	-.259*	-.297*
Arousal	.028	-.167	.353**	.158	.219	.266*

Notes: ** - p<.001; *- p<.05

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Spatial relations in Serbian

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The research aimed to investigate, within the framework of a larger cross-linguistic project, how spatial relations between the given objects are mapped in the Serbian language through an elicitation task and to determine the extent of intersubjective agreement.

Twenty-four native adult speakers of Serbian took part in the experiment, naming the spatial relations between objects presented in the pictures. The experimenter instructed participants to describe the location of an object (marked in orange color) with respect to a ground (in black) by answering the question "Where is X?" (e. g. this is a cup, this is a table: where is the cup?). The participants were expected to name as simple as possible the spatial relations for 71 stimuli. The complete response the participant gave (e.g. "The cup is on the table") was coded as a preposition (e.g. on), while the additional information about spatial location given in other parts of speech (e.g. verbs, case-marking) was not coded. After coding, the frequency list of 1732 answers was made (sometimes a participant gave more than one answer per stimulus, and all of them were coded).

The results show the variety of responses for stimuli, and the dispersion of responses per stimulus can be observed according to the lemma used to name particular relation or according to meaning, i.e. if there are two or more answers for a stimulus, the answers can be synonymous (e.g. in – inside) or have different meanings (e.g. in – on). Overall finding for both lemmatic and semantic approach is that the intersubjective agreement was very high: for 75% of stimuli at least 20 participants provided the same lemma as an answer, and in semantic approach to results we observe even higher agreement (i.e. participants used synonymous prepositions to mark the relevant relations) since for 94% of stimuli at least 20 participants provided semantically same answers. On the other hand, the dispersion of answers (several (semantically different) prepositions used for one stimulus) was due to several reasons: 1) for some stimuli participants used the verb-preposition combination (e.g „merdevine su postavljene *uz* zid", „merdevine su oslonjene *o* zid") and this allowed the use of various prepositions in comparison to using only one preposition in the description; 2) some stimuli were ambiguous because the relations in the picture could be interpreted in different ways (e.g. the tree could be interpreted both in front and next to the church, from the point of participants view or respecting the orientation of the church); 3) some objects in pictures do not frequently co-occur in everyday life (e.g. apple

and ring) or are pragmatically odd (e.g. belt and woman instead of belt and waist) so the participants used combinations that are not the part of the usual language practice.

Since the data were collected for a large number of Indo-European languages, the next stage would involve cross-linguistic comparisons. Such a comparison would show whether the situations that were confusing to the respondents of the Serbian language are universal for other languages as well.

A SNARC-Effect in Grammatical Number Processing in Turkish?

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Numerical processing is a universal ability (Göbel et al., 2011). However, the symbolic representation of quantitative information is unique to humans (Roettger and Domahs, 2015). Many studies conducted on symbolic representations of quantitative information have shown that the mental representation of quantitative information is closely related to spatial representations. In some of these studies, it's been shown that spatial responses are associated with numerical magnitude through the SNARC Effect, that is ''*Spatial-Numerical Association of Response Codes Effect*'' (Dehaene et al., 1993). It refers to participants' faster responses to smaller numbers with the left hand and faster responses to bigger numbers with the right hand (Bulut et al., 2023).

In the relevant literature, the SNARC Effect is one of the most extensively researched topics. One of the accounts of SNARC proposes *a mental number line*, *MNL*, to explain the phenomenon. MNL is the mental representation of the direction of the increase of numbers in our minds from left to right (Shaki & Fischer, 2008). The mental number line account has been associated with the direction of writing from left to right (Dehaene et al., 1993).

The SNARC Effect is often observed along with the *MARC Effect* - that is, faster responses to odd numbers with the left hand and even numbers with the right hand (Cipora et al., 2019). The MARC Effect is the markedness association of response codes, referring to the processing of certain grammatical responses faster or easier than others due to asymmetry or imbalance in the frequency or familiarity of certain grammatical forms (Roettger & Domahs, 2015).

Although the above-mentioned effects have been investigated across many typologically distinct languages, research on Turkish, which is a language written from left to right as in Western languages, is still insufficient (Bulut et al., 2023). The current study will be carried out to see if SNARC and MARC effects will be observed among singular/plural words, in other words, grammatical number in Turkish. Grammatical number is the representation of numerals through words by using single words when referring to one object (*apple*/ Turkish: *elma*) and using plural suffixes (Turkish: -ler/-lar; English: -s) when referring to more than one object (e.g., *apple-s* / Turkish: *elma-lar*). Grammatical number in Turkish presents an interesting case as adding the "-ler/-lar" plural suffix isn't necessary to express plurality (Bale et al., 2010). For example, in the example of "üç kuş," (English: three bird*) the noun "bird" is bare singular, and unlike English, it doesn't have to take the plural suffix "-lar" (English. -s) (Walter, 2014).

Methodology: Data will be collected from 80 native speakers of Turkish. Participants' response times will be recorded to the singular and plural forms of nouns using an adapted version of the Parity Judgement Task on PsychoPy (Peirce et al., 2019). An amount of 20 inanimate nouns will be used in pseudo-randomised order as the targets words chosen to be high in frequency, imageability and concreteness levels extracted from Turkish National Corpus (Aksan et al., 2012) and the book Turkish Word Norms by Tekcan and Göz (2005).

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Exploring the frequency distribution and temporal patterns of non-verbal vocalisations in Romanian monologue speech

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Synopsis and research objectives. Analyses of non-verbal vocalisations (NVVs) in human speech have the potential of bridging the gap between various research fields, from psycholinguistics and clinical linguistics to speech planning, forensic voice comparison, as well as language processing. Even though the interest in this topic has increased over the last decades, researchers tend to examine NVVs independently, with most of the data derived from well-resourced languages such as English (Tottie 2011, Ogden 2013), German (Belz 2023, Trouvain 2003), Dutch (Torreira, Bögels & Levinson 2016), French (Duez 1993), Spanish (Pinto & Vigil 2019) and Italian (Poggi, Ansani & Cecconi 2018). Consequently, our current phonetic investigation aims to broaden our understanding of the frequency and temporal patterns of NVVs in connected speech based on an under-documented European language (Trandabăţ, Irimia, Mititelu, Cristea & Tufiş 2012), implementing a classification put forward by (Trouvain & Truong 2012).

Data and methodology. This pilot study is carried out on 53 minutes of addressed monologue speech pertaining to a healthy monolingual adult male speaker. The data are extracted from a larger Romanian speech corpus (Niculescu 2021) comprised of 12 monologues centered around three topics related to present, past and future activities. All segmentations were manually performed in Praat.

Results and discussion. NVVs make up 24% of the total duration of the monologue (Table 1). An important observation is that silent pauses in monologue speech share a similar frequency distribution with audible inbreath noises (26% each). This result further confirms what was previously advocated by (Belz & Trouvain 2019), whereby silent pauses are not always "silent". In our data, *silent pauses* have an average duration of 345ms (SD = 336ms). In line with (Campione & Véronis 2002), we distinguished between short (<200ms), medium (200-1000ms) and long SPs (>1000ms). Our findings indicate that short and medium-length SPs have a similar frequency of distribution, while long pauses surfaced in 17 cases, averaging at 1488ms. *Audible inbreaths* displayed a typical simultaneous nasal and oral air intake (Lester & Hoit 2014), having a mean duration of 582ms, with 19% of the tokens patterning with clicks. Inbreaths as an offset of laughter are significantly shorter than all other breath intakes (p <0.001), reaching an average of 386ms (SD = 133ms). *Filler particles* (i.e., non-interjectional discrete phonetic segments, semantically empty and syntactically unconstrained (Belz 2023)) have the second highest frequency distribution, amounting to 24% of the data. As showcased by (Niculescu, 2023),

typical FPs in Romanian connected speech are vocalic (/ɨ, ə/), nasal (/m/) and vocalic-nasal outputs. In terms of distribution, results indicate that nasal tokens occur in 51% of the cases, followed by vocalic (40%) and vocalic-nasal outputs (9%). From a temporal perspective, vocalic-nasal forms have the highest average duration, being significantly longer than nasal fillers (t = 9.253, df = 40, p < 0.001), which, in turn, have a longer duration compared to vocalic tokens (p = 0.005). It is interesting to note on the fact that vocalic FPs have a similar average duration with medium-length SPs. Included in the list of possible NVVs [10], onomatopoeia amounts to 10% of the total number of the phenomena under investigation. Following in the hierarchy are swallowing sounds (5%), which frequently display an offset click in our data. Even though the corpus was not designed to elicit laughter, nevertheless this phenomenon was identified in our material (4%), with *speech laughs* having a higher distribution compared to *laughs*. Among all non-verbal vocalisations, speech-synchronous forms of laughter [4] have the highest average duration, lasting for over 4s, surpassing long SPs. *Exhalation* sounds occur less frequently, being identified in only 3% of the cases, registering a significantly shorter duration than inbreaths (p = 0.008), while *tongue clicks* and *cough* noises were observed in 2% of the data. Another equally significant result uncovered in this exploratory analysis is that NVVs do not pattern separately, but rather group into clusters (Figure 1). Among the most frequent are inbreaths followed by silent pauses (40%).

Table 1. Frequency distribution and duration of NVVs

	%	N	Ratio per min	Min (ms)	Max (ms)	Mean ± Std.
short silent pause	11.68%	170	3.2	98	198	139.8 ± 29.35
medium silent pause	13.32%	194	3.7	201	992	425.34 ± 207.83
long silent pause	1.17%	17	0.3	1055	2889	1487.59 ± 484.13
inbreath	21.29%	310	5.8	201	1405	560.81 ± 214.56
inbreath with click	4.81%	70	1.3	180	1398	673.39 ± 256.31
exhalation	3.09%	45	0.8	123	1613	457.07 ± 295.14
swallowing	3.16%	46	0.9	139	1291	753.89 ± 247.32
swallowing with click	2.27%	33	0.6	375	1892	882.52 ± 308.82
click	1.17%	17	0.3	33	289	130.12 ± 66.47
laughter	1.58%	23	0.4	404	2346	1078.48 ± 512.76
speech laugh	2.54%	37	0.7	600	4273	1802.54 ± 955.57
vocalic filler particle	9.75%	142	2.7	52	1047	423.18 ± 243.28
nasal filler particle	12.36%	180	3.4	90	2427	516.78 ± 368.92
vocalic-nasal filler particle	2.27%	33	0.6	593	2287	1281.42 ± 447.64
onomatopoeia	9.48%	138	2.6	90	747	258.04 ± 112.35

Figure 1. Spectrogram and waveform of NVVs in connected speech showcasing *fluent speech* (1 and 7),
inbreath with click (2), *cough* (3), *swallowing* (4) followed by a *click* (5) and a *vocalic filler particle*
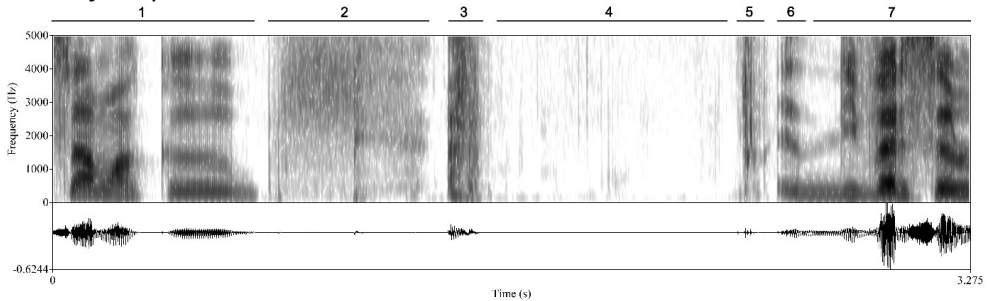
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Sentiment Analysis of two Slavic Cultures' Reactions to News Posts

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The popularity of social media platforms like Telegram and Twitter, or, X (which have more open policies of data collection) has largely increased the volume of user-written content, particularly comments on popular posts. We focus on comments on news stories by Czech and Ukrainian users because of the accessibility of these data (Facebook or Instagram do not have such an open policy of data collection and Telegram is not much used by Czech users, while Telegram is very popular among Ukrainian users). These platforms still might differ in user demographics, which should be compensated by a large enough dataset for the comparison of the comments' sentiment and the similarity of the chosen posts for the analysis (we always choose a similar news post for comment extraction)

Using sentiment analysis, we categorize each of the 6000 comments (half Czech, half Ukrainian) into negative, positive and neutral. We confirm the negativity bias of journalism since the category with the highest number of comments is always the negative one. However, it is not always easy to categorize the sentiment into three simple categories. Some comments may require wider context and exact information on what the comment is reacting to and also, what the background of the commentator is. For different people, the sentiment of the same comment can differ and the context may modify the sentiment significantly.

We experiment with 3 different up-to-date large language models: ChatGPT-3.5, Twitter-RoBERTa-XLM and Zephyr 7B Beta. We examine where these three models differ and identify the reasons: whether it is a different capacity of understanding or different intepretation of slang, neologisms, emojis, vulgarisms, sarcasm, irony, culture-dependent humor or other aspects. The differing comments are then assessed by non-expert human evaluators from the given culture to ensure independent evaluation. We are looking for potential inherent cultural biases that the models might have.

Preliminary results indicate that all three models have quite an advanced understanding of sentiment, but RoBERTa is somewhat weaker in interpreting irony or neologisms. Zephyr demonstrates a certain distance because of a higher number of neutral comments, where the sentiment seems ambiguous. Our study shows the potential of current LLMs in sentiment analysis and their potential drawbacks or room for improvement and reflects the mood of users expressed on social media.

Opening the umbrella term of faux pas: socio- and cognitive pragmatic approaches

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Aims: In this presentation, we are focusing on faux pas, a conversational blunder, which is committed by the communicator based on a false belief without offensive intentions, and has unpleseant consequences (Stone et al., 1998; Baron-Cohen et al., 1999). Our aim is to examine a) how socio- and cognitive pragmatic approaches help to differentiate between the possible interpretations of faux pas phenomena; b) how the Faux Pas Recognition Test (Stone et al., 1998) can be refined along these lines; c) and how autistic and non-autistic adults perform on a modified version of the test.

Material and method: Faux Pas Recognition Test (adult version) was applied with two additional target questions invented by us. Data were collected via Jotform online form builder, and processed using IBM SPSS Statistics 26.0 Program. 12 autistic and 11 non-autistic adults participated in the research.

Discussion: Qualitative and quantitative analyses were conducted with a sociopragmatic approach applying Goffman's facework (1955) and redressive action coined by Brown and Levinson (1987), while Relevance Theory (Sperber & Wilson, 1995) provided the cognitive pragmatic framework.

Conclusion: We found that a) 'opening' the umbrella term of faux pas by applying socio- and cognitive pragmatic frameworks allows us to indentify different linguistic and pragmatic phenomena, such as 'slip of the tongue' (Ivaskó, 2000; Ivaskó & Németh T., 2002), 'overhearing' (Verschueren, 1987; 1999) and 'mistake'. Our results also show, that b) the modification of the Faux Pas Recognition Test can provide a deeper insight into the metapragmatic and inferential processes of subjects; and finally, that c) the explicit form of redressive action can serve as a linguistic cue for recognizing the affective and cognitive mental states of the speaker who commited the faux pas.

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