

Words in the World International Conference 2023

Abstract Book





Oral Presentation Schedule

Friday

10:00 – 10:45 Session A (3 talks)

Cognitive control states modulated lexical competition effect during language production

SIFAN ZHANG (The University of Macau, Centre for Cognitive and Brain Science)*; Keyi KANG (Centre for Cognitive and Brain Sciences & Department of Psychology, University of Macau); HAOYUN ZHANG (The University of Macau, Centre for Cognitive and Brain Science)

Associations between vocabulary and declarative memory abilities in early childhood: A meta-analysis

Hannah R Fender (Kent State University - Department of Psychological Sciences); Phillip Hamrick (Kent State University)*

A mouse can tell us how we solve analogical reasoning problems in L1 and L2

Miki Ikuta (Nagoya University)*; Koji Miwa (Nagoya University)

Cognitive control states modulated lexical competition effect during language production

During language production, people often encounter multiple lexical candidates that compete for selection. Previous studies have shown that cognitive control states might facilitate the ability to resolve lexical competition during language comprehension (e.g., Hsu, Jaeggi, & Novick, 2017). The current study investigates the influence of cognitive control states in competition resolution during language production, using behavioral and fMRI techniques. Using a picture name paradigm, lexical competition was manipulated via name agreement. Compared to high name agreement items (e.g., a picture of a *keyboard* only has one proper name), low name agreement items (e.g., a picture of a *wrapped box* has multiple alternative names, *box*, *gift*, or *present*) would elicit stronger lexical competition. A Stroop trial preceding the naming trial was used to induce cognitive control states. Specifically, conflict Stroop trials (“GREEN” printed in blue) would elicit a more focused control state compared to non-conflict Stroop trials (“BLUE” printed in blue). A 2 (Stroop condition, conflict vs. non-conflict) \times 2 (name agreement, high vs. low) design was formed.

First, pictures with high name agreement were responded better (i.e., faster response time RT and higher accuracy ACC) compared to pictures with low name agreement, indicating the interference effect from lexical competition. Additionally, compared to the non-conflict Stroop trials, the conflict Stroop trials (i.e., more focused control states) facilitated the subsequent picture naming performance, reflected by faster RT and higher ACC. Interestingly, the facilitation effect from a more focused control state (i.e., Stroop conflict) was significantly stronger in the low lexical competition condition (i.e., high name agreement) than in the high competition condition. These preliminary findings support our hypothesis that more focused cognitive control states facilitate solving lexical competition during language production.

Supporting figures

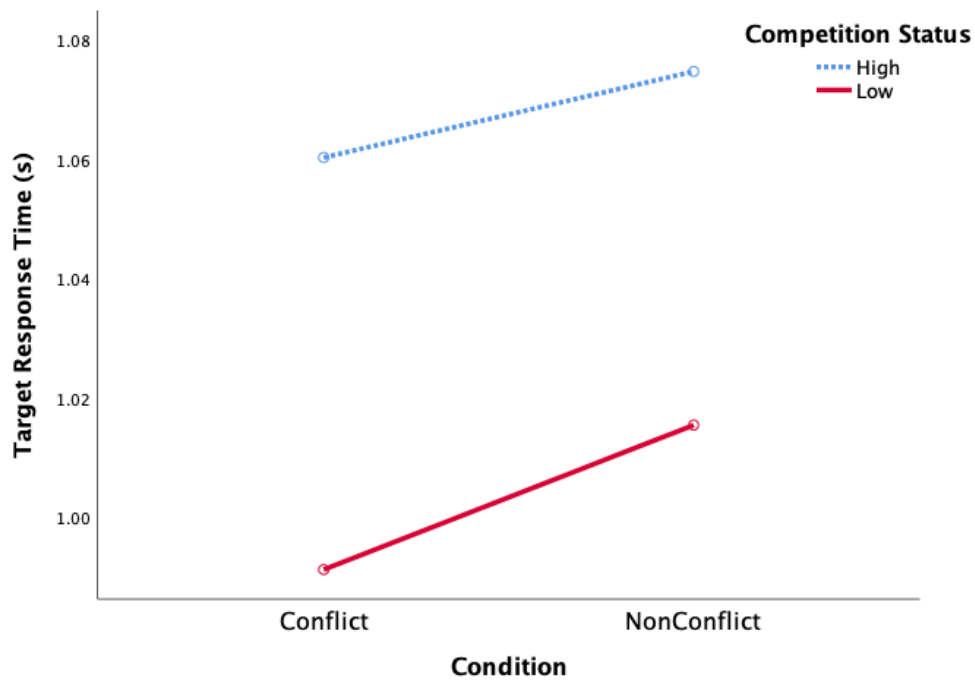


Figure 1.

Effects of Stroop conditions and naming competition on the target response time.

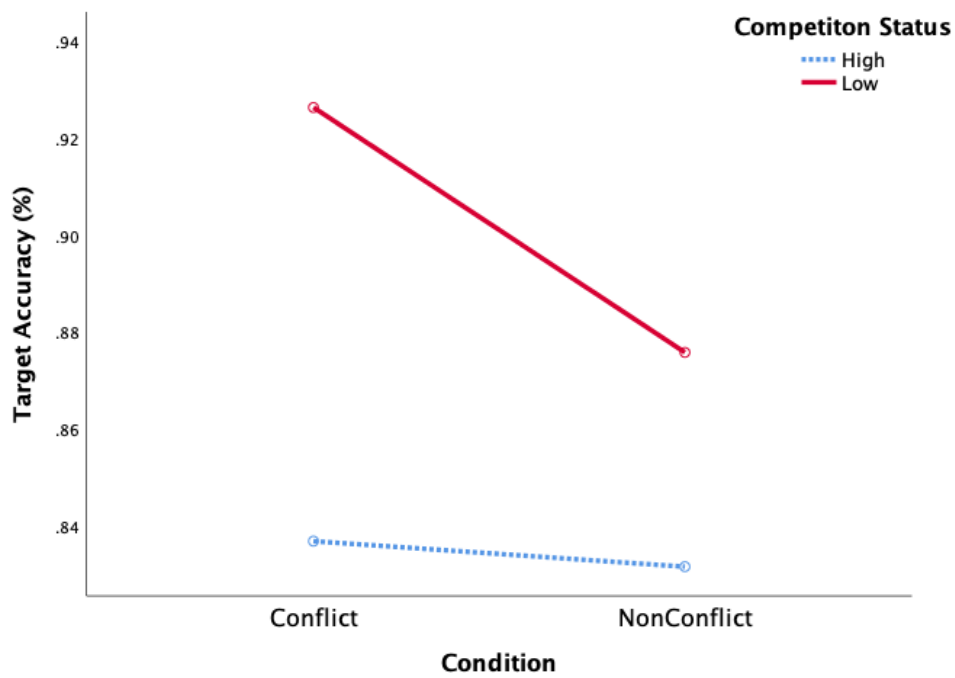


Figure 2.

Effects of Stroop conditions and naming competition on the target response accuracy.

Associations between vocabulary and declarative memory abilities in early childhood: A meta-analysis

Several theories implicate the medial temporal lobe based declarative memory system in several aspects of language acquisition and processing, especially in the learning, representation, and retrieval of words (Davis & Gaskell, 2009; Ullman, 2016; Witzel & Forster, 2012). Numerous lines of evidence have been marshaled in support of this hypothesis, and a particularly compelling and robust line of evidence comes from individual differences research. A recent meta-analysis of this body of research showed generally strong correlations between declarative memory abilities and word knowledge (Hamrick, Lum, & Ullman, 2018). However, most of those studies looked at older children and adults. Moreover, these studies primarily relied on declarative memory tasks that were verbal, leading to a potential confound in the causal mechanisms underlying the correlations between declarative abilities and word knowledge (Morgan-Short, Hamrick, & Ullman, 2022). As such, it is unclear whether *nonverbal* declarative memory abilities in earlier childhood (i.e., 9 - 36 months) are associated with vocabulary development. This is a critical gap given how important the vocabulary spurt in this age range is to subsequent linguistic development.

The present study examines precisely this topic. We conducted a systematic literature search and meta-analysis examining links between nonverbal declarative memory abilities and vocabulary abilities in neurotypical children between the ages of 9 and 36 months ($N = 254$). A total of 14 correlations ($k = 6$) were meta-analyzed using the `metafor()` package in R (Viechtbauer, 2010), with random intercepts for each study, yielding a significant mean weighted correlation coefficient of $r = .26$, $SE = .065$, $t(13) = 3.91$, $p < .001$, 95% CI [.12, .40]. A Q-test revealed no significant effects of study homogeneity, and funnel plot and bias analyses revealed no evidence of publication bias.

The results are consistent theoretical proposals that declarative memory abilities underpin at least part of vocabulary development as early as 9 months of age. Furthermore, these need not specifically be verbal declarative abilities. In addition to their theoretical implications, these results help pave the way for declarative memory-based interventions that may improve outcomes for children with developmental language disorders based on techniques known to improve declarative learning (e.g., spaced practice, retrieval practice).

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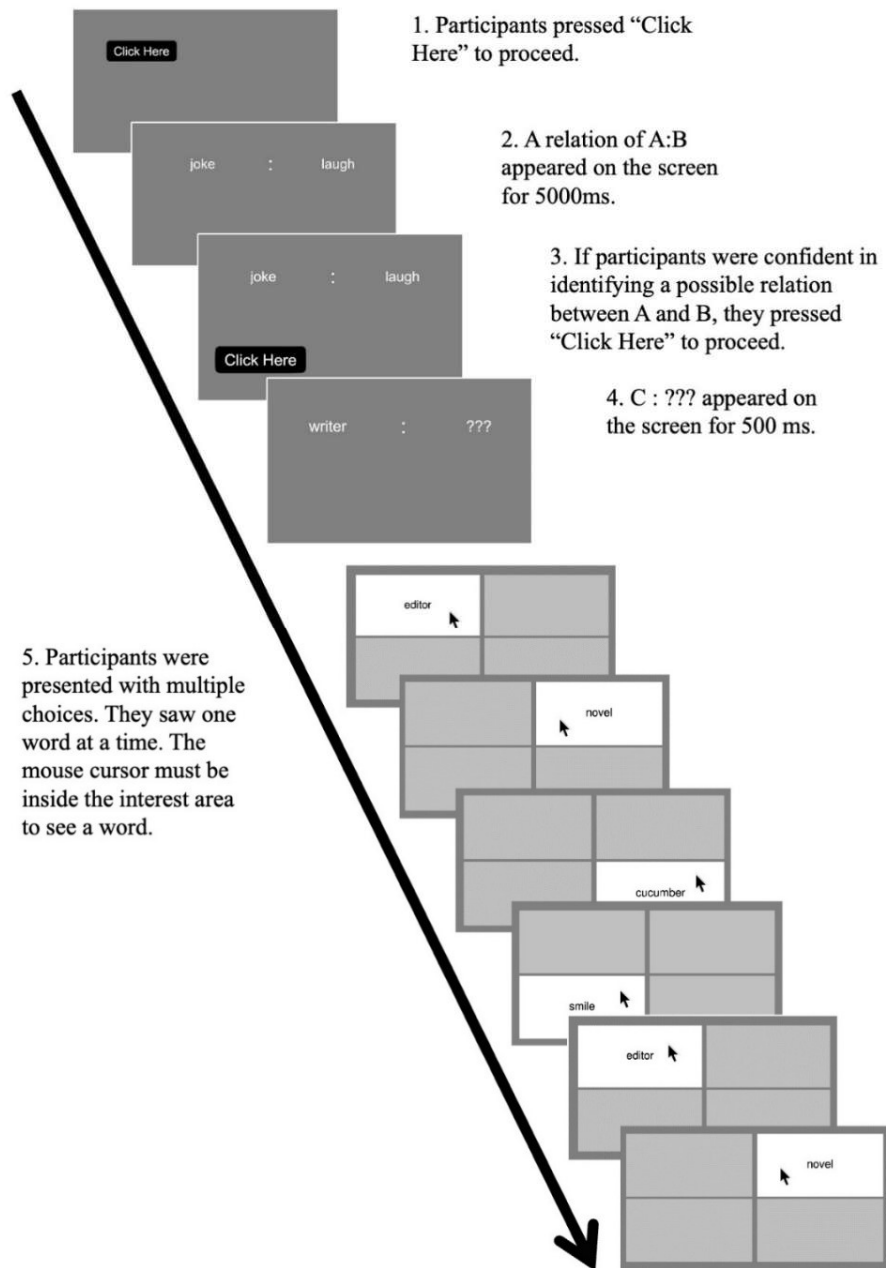
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A mouse can tell us how we solve analogical reasoning problems in L1 and L2

Analogical reasoning is an important cognitive skill in learning. Researchers suggest that using less proficient languages to solve verbal analogies causes lower accuracy (Francis, 1999; Fukumine & Kennison, 2016; Wakebe et al., 2015). Such a language inhibitory effect has been attributed to the increased cognitive demand. To investigate the time-course of analogical reasoning processes in first (L1) and second languages (L2), PC-mouse tracking experiments were conducted.

Participants were 59 Japanese learners of English. They were asked to solve 100 analogy problems (e.g., delight : happiness :: woman : ???) followed by four multiple choices to choose from (e.g., lady, success, man, TV). Problems and choices were shown in Japanese for the L1 condition and in English for the L2 condition. Participants were divided into two groups, and the order of the language conditions was counterbalanced. Because the mouseover effect was active, during the PC-mouse tracking experiments, participants were instructed to move their PC-mouse cursor to see the answer choices (See Figure1). The time that their cursor stayed on a word was recorded. The (generalized) linear mixed effects modeling revealed that solving problems in L2 caused lower accuracy and longer response times than doing the same in L1. The generalized additive modeling analysis revealed that in both L1 and L2 conditions, participants spent a relatively equal amount of time reading each choice in the beginning. However, they started to detect answers at the time of 860 ms after multiple choices were revealed in the L1 condition, whereas they spent longer time looking at other competitors in the L2 condition. We conclude that the inhibitory effect of L2 use in analogical reasoning would be explained by not only the cognitive demand related to simple lexical processing but also by the one specific to the characteristics of analogical reasoning processing such as knowledge transfer and conceptual matching between two domains.

Figure 1. The procedure of PC-mouse tracking experiments



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10:55 - 11: 55 Session B (4 talks)

Perceptual Span in Mongolian Text Reading

Yaqian Bao (McMaster University)*

Flankers' Spatial Proximity Affects Foveal Word Recognition: Evidence from a Flanked-word Visual World Paradigm

Stefania Antonia Kyriakidou (McMaster University)*; Laoura Ziaka (University of Oslo); Bob McMurray (University of Iowa); Dzan Zelihic (University of Oslo); Kristin Simonsen (University of Oslo); Athanassios Protopapas (University of Oslo)

Reading in otro idioma: Predicting individual differences in skipping in English as L2

Diana Esteve Alguacil (University of Cambridge)*; Denis Drieghe (University of Southampton); Manuel Perea (University of Valencia); Bernhard Angele (University of Nebrija); Victor Kuperman (McMaster University)

Cross-Linguistic Variability in Eye-Movement Control: Comparing Landing Positions of Regressive and Progressive Saccades

Laura Schwalm (University of Wuppertal)*; Ralph Radach (University of Wuppertal); Victor Kuperman (McMaster University)

Reading in otro idioma: Predicting individual differences in skipping in English as L2

A common assumption in most leading models of eye movement control during reading (e.g., E-Z Reader) is that skipping occurs when the word $n+1$ has been sufficiently identified. However, other models more focused on visual factors posit that skipping is not only related to achieving recognition, but also an educated guess of what can be safely skipped. Moreover, all these major models have largely ignored both individual differences and non-monolingual readers.

Recent research (Siegelman et al., 2022) underscores that word skipping in one's first language (L1) is closely related to average word length. Additionally, second language (L2) proficiency appears to influence word skipping in L2.

Following these results, the current study investigates the role of individual differences and L2 proficiency in L2 word skipping using the multi-lab MECO database. Higher L2 skipping was predicted in those with higher L2 proficiency, those whose L1 had a higher average skipping rate, and those with a higher average skipping rate in their L1 compared to other participants. Our analysis led to a binomial linear mixed model with L2 proficiency, L1 average skipping, and mean skipping per language being significant predictors and interacting with word length. Results confirmed our predictions, although the effect was smallest for the mean skipping per language. These findings highlight the importance of including individual differences and language backgrounds in reading models.

Cross-Linguistic Variability in Eye-Movement Control:

Comparing Landing Positions of Regressive and Progressive Saccades

During reading, precise decisions of where and when to move the eyes are critical. A large body of work on eye movement control suggests that words (strings of letters delineated by empty spaces) serve as functional targets for reading saccades. At least for alphabetic languages, progressive saccades are driven by the reader's attempt to reach the word center as an optimal position for letter processing. Actual landing positions are the results of the interplay between visuomotor factors such as launch distance and word length, with only minimal cognitive influence. These effects result in systematic variation so that the eye tends to land further to the right for closer landing sites and longer words (McConkie et al., 1988). Interestingly, short range regressions (saccades moving one or two words back to the left) exhibit minimal sensitivity to these factors (Radach & McConkie, 1998), with landing consistently peaking at the center of the word.

While previous studies have predominantly focused on German and English, our research intends to explore the validity of these unique saccade landing patterns across a wider selection of languages. Expanding upon Kuperman's (2022) research on progressions, we explore the influence of language on eye movements during regressive and progressive saccades using the Multilingual Eye-Movement Corpus (MECO) data set.

Our examination of 13 languages indicates that the length of words and launch distance indeed have a significant impact on the landing positions of progressive saccades. Greater launch distances and longer words tend to result in undershoots relative to the word center, while shorter launch distances and words tend to result in overshoots. In contrast, regressions invariably tend to attain the word center in all languages, regardless of launch distance or word length. We conclude that basic visuomotor mechanisms of eye movement are essentially universal for reading written languages using spacing to mark word boundaries. Our discussion of why short-range regressions are so accurate is focused on the role of visual-spatial memory in reading (Kennedy et al., 2003).

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13:10 - 14:10 Session C (4 talks)

Red Light, Green Light: The Role of the IFG and STG in Overt versus Covert Speech Production
Dima NK Alsaigh (University of Alberta)*

A Psycholinguistic Analysis of Neuropsychological Tests
Brette Lansue (University of Windsor)*; Lori L Buchanan (U Windsor)

Neurophysiological characteristics of new words acquisition in children with language impairment
Alexander Szykh (Institute of Higher Nervous Activity and Neurophysiology)*; Antonina Shaposhnikova (Scientific-Applied Center for Pediatric Psychoneurology, Moscow Health Department); Anna Rebreikina (Institute of Higher Nervous Activity and Neurophysiology)

Word discovery through incremental chunking: How children find words in natural and artificial languages
Andrew Jessop (University of Liverpool)*; Julian Pine (University of Liverpool); Fernand Gobet (London School of Economics and Political Science)

Title of presentation: Red Light, Green Light: The Role of the IFG and STG in Overt versus Covert Speech Production

Presenting Authors: Dima Alsaigh & Talah Hasanni

Full names and affiliations of all other authors:

Jacqueline Cummine^{1,2,3}, Mitchell Holmes³, Kulpreet Cheema^{2,3}, Truc Huynh³, Sarah Saju², Torrey Loucks¹, Daniel Aalto^{1,4}

Institutions

1. Communication Sciences and Disorders, University of Alberta
2. Neuroscience and Mental Health Institute, University of Alberta
3. Faculty of Rehabilitation Medicine, University of Alberta
4. Institute for Reconstructive Sciences in Medicine, Misericordia Hospital

Background. In brain imaging, there is much evidence that suggests overlapping brain regions in reading and speech, like the superior temporal gyrus (STG; Novi et al., 2020) and inferior frontal gyrus (IFG; Keller & Kell, 2016). Recent research has explored the magnitude of the shared activity between silent (covert) and aloud (overt) reading (Kell et al., 2017), which informs the question of how connected reading and speech are. In this study, we use functional near-infrared spectroscopy (fNIRS) to examine how covert and overt reading differentially activate the STG and IFG.

Methods. Participants (N = 69 adults) were fitted with an fNIRS cap and seated in front of a computer. They were presented with 510 word/nonword stimuli. Each trial was followed by either a red square ('say the stimulus silently') or a green square ('say the stimulus aloud').

Analysis. FNIRS data was preprocessed using standard steps to address noise, physiological artifact, and movement. Oxygenated blood from covert and overt trials were averaged across participants, and separated by the preparation (before cue) and execution (after cue) phases. Paired t-tests assessed differences in STG and IFG oxygenated blood levels.

Results. In the preparation phase, there were no significant differences in oxygenated hemoglobin levels in the IFG and STG. In the execution phase, however, overt speech significantly differed from covert speech in both IFG and STG ($p < 0.05$; see Figure 1).

Conclusions. This study emphasizes IFG and STG's involvement in overt and covert speech and highlights fNIRS' suitability for diverse populations due to its virtually silent, motion-resistant, and implant-compatible nature. These findings open avenues for improving our understanding and treatment of speech-related disorders.

NEUROPHYSIOLOGICAL CHARACTERISTICS OF NEW WORDS ACQUISITION IN CHILDREN WITH LANGUAGE IMPAIRMENT

Keywords: speech development delay, word acquisition, event-related potentials

Children begin mastering language from an early age. It is observed that young children are able to learn the word and its meaning after several exposures along with its reference, e.g. a real object. Children with language disorders are often characterized by a reduced vocabulary, which may be due to difficulties in forming links between a word and its meaning. This research attempts to clarify the neurophysiological properties of new words acquisition in children with different severity of language disorders.

30 children (five were excluded) without intellectual disabilities aged 3 to 8 years old (mean=5.52, SD=1.31) participated in the experiment. Based on the speech therapist assessment, the participants were divided into two groups: with slightly and more pronounced language impairment. The design of the experiment was similar to the work of Bergstrom et al., 2015. Event-related potentials (ERPs) were registered using a 28-channel system, while children watched the pictures on the screen and listened to the words. The stimuli were 30 known to children words, 30 pseudowords (5-6 letters length, two-syllable) as well as 30 pictures corresponding to the words and 30 pictures of novel, invented objects. Stimuli were presented in ten blocks containing three words, three pseudowords, and correspondent pictures. Each 'picture—word/pseudoword' pair was presented four times in a pseudorandom order. The 5th presentation of the word/pseudoword was accompanied by a picture associated with another word/pseudoword from the same block (incongruent condition). The pictures were presented for 2000 ms. After 900 ms of the picture onset, the auditory word was presented. The inter-stimulus interval was 800 ms.

We analyzed ERPs to words and pseudowords in the 3rd and 4th presentations (congruent condition) and the 5th presentation (incongruent condition). The mean ERP amplitude from occipital-parietal channels was analyzed in the interval 500—1000 ms after the word presentation. The repeated measures analysis of variance (rmANOVA) for data including the following factors, Group (low vs. high impairment) * Congruency (congruent vs. incongruent condition) * Stimulus Type (word vs. pseudoword) * Laterality (left vs. middle vs. right channels).

The analysis revealed significant (at the trend level) interaction between Congruency and Stimulus Type ($F(2, 23)=3.37, p=.052$). Further analysis showed a significant difference between real words and pseudowords in the congruent condition ($F(2, 23)=4.29, p=.03$). The amplitude of evoked response to pseudowords was more positive than to real words. Contrasting between real words in the congruent and incongruent conditions observed more positive ERP amplitude in the incongruent condition ($F(2, 23)=3.74, p=.04$). Comparison of pseudowords in the congruent and incongruent conditions revealed a significant interaction of Congruency and Laterality ($F(4, 21)=4.07, p=.01$). The ERP amplitude in the incongruent condition was lower than in the congruent condition on the middle channels. The Group factor and its interaction with other factors did not show any significance.

The results suggest that the severity of speech disorders does not influence the semantic processing of known and new words. Processing of new words (pseudowords) after 3—4 exposures still differed from known ones; however, incongruency effects were observed as to word as to pseudoword. We suppose that after four exposures the pseudoword already forms the connection with its reference, but yet not to the extent of a known word.

Borgström, K., von Koss Torkildsen, J., & Lindgren, M. (2015). Substantial gains in word learning ability between 20 and 24 months: A longitudinal ERP study. *Brain and language*, 149, 33–45. <https://doi.org/10.1016/j.bandl.2015.07.002>

Word discovery through incremental chunking: How children find words in natural and artificial languages

Although the speech children hear is mainly produced as multiword utterances without pauses, they still manage to learn a variety of words and become productive language users. One explanation is that they discover words by learning chunks for sub-sequences embedded in their continuous input (Perruchet, 2019), but the mechanisms proposed in these accounts are often incompatible with data from other areas of language development. We present a new theory to connect the chunking accounts of word discovery with the broader developmental literature. We argue that (a) children build a diverse collection of chunks, including words, multi-word phrases, and sub-lexical units; (b) these chunks have different retrieval times determined by how often each chunk is used to recode the input; and (c) that these retrieval times interact with short-term memory limitations and incremental processing to constrain learning. We implemented this theory as a computational modelling architecture called CIPAL (Chunk-based Incremental Processing and Learning). Across nine studies, we demonstrate that CIPAL can model word discovery in different contexts. First, we trained CIPAL with 70 child-directed speech corpora from 15 languages. The model gradually discovered words in each language and produced vocabulary growth curves consistent with the developmental trends observed in children. Average retrieval time also improved with experience, resembling the developmental changes observed in children's speed of processing. Second, we showed that CIPAL could simulate seven influential effects reported in statistical learning experiments with artificial languages. This included a preference for words over nonwords, part words, frequency-matched part words, phantom words, and sub-lexical units. On this basis, we argue that incremental chunking is an effective implicit statistical learning mechanism that may be central to language development.

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15:25 - 16:25 Session D (4 talks)

The Impact of Sociolinguistic Differences on Multilingual Background Measures: Validating Language Entropy Part 2

Michelle Yang (McGill University)*; ANTONIO INIESTA (McGill University); Anne Beatty-Martinez (University of San Diego); Inbal Itzhak (Canadian Consortium on Neurodegeneration in Aging (CCNA)); Jason Gullifer (Marianopolis College); Debra Titone (McGill University)

Generating and Revising Moral Decisions During First- and Second-Language Reading

Esteban Hernandez-Rivera (McGill University)*; karla s Tarin (McGill University); Alessia Kalogeris (McGill University); Dan Chen (McGill University); Debra Titone (McGill University)

Context positivity facilitates L2 word learning: An eye tracking study

Nadia Lana (McMaster University)*; Bryor Sneffjella (Arizona State University); Victor Kuperman (McMaster University)

The Role of Emotion in Abstract Word Processing: Evidence from Reading Aloud and Lexical Decision

Catherine J Mason (Macquarie University)*

The Impact of Sociolinguistic Differences on Multilingual Background Measures: Validating Language Entropy Part 2

In the linguistically diverse setting of Montréal, each speaker has a unique language background that is influenced by the interplay of historical, political, and sociocultural factors (Kircher, 2014; Leimgruber, 2020). For example, 59.9% of residents in the metropolitan area of Montreal reported French as their mother tongue, compared to 11.2% of residents who reported English as their mother tongue (Statistics Canada, 2021). However, 56.4% of residents report that they are able to have a conversation in both English and French, compared to just 18.0% in the rest of Canada, and 46.4% in Quebec as a whole (Statistics Canada, 2021). As such, each and every speaker in Montreal has a unique experience using French and English in their day-to-day activities. One way to quantify this type of experience is using language entropy (Gullifer & Titone, 2018; Gullifer & Titone, 2019). Language entropy measures the diversity of multilingual language usage. While there has been some research indicating that language entropy relates straightforwardly to other markers of bilingual experience (such as exposure and abilities), predicts cognitive control abilities (and corresponding neural correlates), and varies depending on the communicative context of language usage (Gullifer et al., 2018; Gullifer & Titone, 2020; Gullifer & Titone, 2021), it is not well understood what the impact of language background and social context is on language entropy.

To this end, we build on a complementary work (see Iniesta et al., 2023) to analyze how three different bilingual groups vary in their language usage and how the composition of their social network plays a role. We tested French-English, English-French, and simultaneous bilinguals from the McGill University community. We thus examined the links between general language entropy (both general and context-specific), and entropy based on more detailed social network measures (both general and context-specific). We use Exploratory Factor Analysis to explore how the social context of multilingualism affects language entropy. We found that English-French bilinguals had higher factor scores for L1 Homophily (a measure of how many people in your network with whom you speak your L1) compared to French-English and simultaneous bilinguals, which means that English-French bilinguals in our sample are more likely to have social connections with people who can speak English. In addition, we found that this remained consistent across social contexts. We also found that general language entropy and social network-based entropy loaded into the same factor, alongside L2 Homophily (a measure of how many people in your network with whom you speak your L2) both generally and across social contexts, with no significant differences between our language groups. This suggests that general language entropy taps into the same underlying construct as the more fine-grained social network entropy and is consistent across various sociolinguistic groups. This work highlights the importance of taking specific communicative contexts and sociolinguistic background into account when interpreting language entropy.

Generating and Revising Moral Decisions During First- and Second-Language Reading

Reasoning and decision-making about real-world concerns are core features of human experience. These decisions routinely involve judgements about the morality of people and their actions. For example, if Person A does something objectively bad to Person B, we might decide that Person A behaved immorally. However, if we later learn that Person B previously did something bad to Person A, we may be emotionally inclined to revise our initial decision to partially exonerate Person A's bad action. This example is framed using negative valence; however, similar effects can ensue for positively valenced scenarios. For example, if Person A does something objectively and unexpectedly good/kind for Person B, we might decide that Person A behaved morally. However, if we later learn that Person B had previously done something objectively good for Person A, we may be emotionally inclined to revise our initial decision to partially discount Person A's action as merely transactional.

Indeed, recent research on moral decision-making suggests that such effects emerge for people who engage with such scenarios in their first language (Malle, 2021; Kim et al., 2022). Still, a crucial open question is how different sources of information (i.e., objective facts about specific actions vs. extenuating circumstances that appeal to our emotions) modulate people's moral decisions, and of particular importance here, how the languages in which we encode this information further modulates these phenomena (Caldwell-Harris & Ayçiçeği-Dinn, 2021; Guglielmo, 2015). On the latter point, a growing body of work on the Foreign Language Effect suggests that people who speak multiple languages are more objective and less emotional when making moral decisions when reading in a second vs. a first language (L2 vs. L1; Costa et al., 2019; Hayakawa et al., 2017). However, there are numerous gaps in this literature. For example, existing studies mostly address negative scenarios, use small numbers of stock moral scenarios that are not psycholinguistically controlled (e.g., variations of the Trolley Dilemma; Christensen et al., 2012), and have yet to sort through whether such effects arise from individual differences among bilinguals vs. monolinguals, or basic differences in comprehension ability between L1 and L2 language processing (e.g., Kirova & Camacho, 2020; Maschio et al., 2022).

To begin to address these issues, we investigate how L1 and L2 adult readers make use of contextual and linguistic cues when generating and updating moral decisions about other people's actions. We have thus far recruited 71 English-French bilinguals who read and made a sequence of moral decisions for 122 linguistically controlled sentence pairs describing negative or positive transitive actions (e.g., A *shamed* B after B *conned* the store customers; A *admired* B / because B *valued* the store customers). Participants' word-by-word reading times and two-alternative forced-decisions were recorded via button presses during a self-paced reading and decision-making task.

A preliminary analysis using Bayesian logistic mixed effects models of participants' initial and revised moral decisions revealed three key results. First, irrespective of language background, all readers judged negative moral actions to be less moral than positive actions. Second, given later additional context for each action, all readers showed a tendency to revise their decisions to morally exonerate negative actions and, to a lesser degree, morally discount positive actions (see also Kim et al., 2022). Third, and crucially, L2 readers differed from L1 readers in their moral revisions, though not in a manner straightforwardly predicted by past work on the Foreign Language Effect. Rather, L2 readers were less likely to exonerate negative actions given additional context AND more likely to discount positive actions given past work. This suggests an overall tendency to evaluate other people's actions in a negative manner rather than in an unemotional utilitarian manner, a finding that is different in spirit from past work on the foreign language effect. Whether this pattern extends to on-line reading processes that precede decision outcomes, or persists after controlling for people's inherent moral tendencies, are among the many research questions we continue to pursue with these data.

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Context positivity facilitates L2 word learning: An eye tracking study

Purpose: Long and informative linguistic context facilitates novel word learning (Williams & Morris, 2004). Snefjella and Kuperman (2016) show that positivity of context improves word memory and recognition also. Snefjella, Lana and Kuperman (2020) examined the influence of context emotionality in explicit vocabulary learning in L1 speakers of English, predicting better semantic memory for novel words in positive contexts. The current study examines whether this positivity advantage is present for L2 speakers of English.

Method: 42 L2 speakers of English in this experiment. All participants read 45 passages while their eye movements were recorded, with 9 new words occurring 5 times each. For a given participant, a specific novel word occurred consistently in positive, neutral, or negative contexts (John used plurk to [dig a grave]/[do some yard work]/[plant flowers]). Reading was followed by post-tests measuring orthographic and semantic word knowledge. The post-tests were repeated one week later to test retention.

Results: Semantic knowledge indicated a significant lasting advantage for nonwords learned in a positive context. Orthographic tests and eye-movements showed evidence of learning but were not influenced by emotionality. The eye-movements placed the emotionality effect in memory retrieval and not memory encoding.

Conclusions: Context emotionality may be a tool in enhancing vocabulary acquisition outcomes in L2 learning.

The Role of Emotion in Abstract Word Processing: Evidence from Reading Aloud and Lexical Decision

Catherine Mason^a, Solène Hameau^{ab}, Lyndsey Nickels^a

^aMacquarie University, Sydney, Australia

^bUniversité Catholique de Louvain, Louvain-la-Neuve, Belgium

There has been growing interest in the role of emotion in abstract word processing. Altarriba and Bauer (2004) found that the subset of abstract words that label emotions (e.g., “happiness”) have a processing advantage over other abstract words, possibly due to their comparatively high imageability and context availability. In contrast, other researchers have shown that word type (emotion vs. non-emotion) and imageability have limited influence on abstract word response times in lexical decision, and suggest that affective variables (valence and arousal) may be stronger predictors (Kousta et al, 2011; Vinson et al., 2014). Research to date has focused on lexical decision tasks with comparatively little research on abstract word production. Hence, we aimed to extend previous research by exploring outcomes in both lexical decision and in a production task (reading aloud) regarding:

- Whether abstract words that label emotions (“emotion words”) differ from other abstract words (“non-emotion abstract words”)
- The influence of semantic variables, focusing on valence, arousal, imageability and context availability on response times in each task.

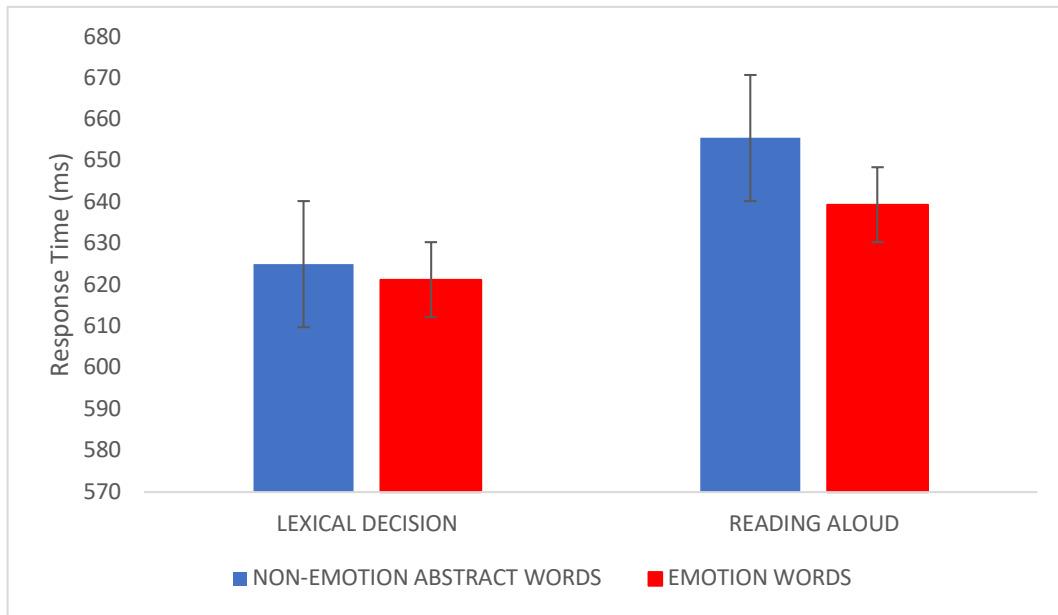
Method: 67 native monolingual English speakers performed written lexical decision and single word reading aloud tasks, with experimental stimuli comprising 104 abstract words (52 emotion-label, 52 non-emotion).

Results: Analysis using linear mixed effects models showed for lexical decision, only imageability was a significant predictor of response time ($\beta = 0.034$, $SE = 0.017$, $p = .040$). In contrast, in reading aloud only word type was a significant predictor ($\beta = 0.017$, $SE = 0.007$, $p = .026$) with emotion words read faster than non-emotion words.

Discussion/Conclusions: Our research showed distinct patterns of results for lexical decision and reading aloud. While different effects of semantic variables have been reported previously across these tasks (e.g., Balota et al., 2004), the word type effect in reading aloud is not predicted by current theory and indicates that further investigation of abstract word processing in production tasks is needed. The unexpected finding of an imageability effect, but no valence/arousal effect in lexical decision also contrasts recent research and may be explained by the relatively high imageability ratings of our abstract stimuli.

Figure 1

Mean response times for emotion and non-emotion abstract words in lexical decision and reading aloud



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Saturday

10:00 – 11:00 Session E (4 talks)

Adaptation, Translation, and Validation of 'Child Language Experience and Proficiency Questionnaire' (Child LEAP-Q) in Kannada

Megha K (Manipal Academy of Higher Education)*; Dr. Shivani Tiwari (Manipal Academy of Higher Education); Dr. Sunila John (Manipal Academy of Higher Education)

Does the contextual information in test items influence English morphological awareness measures' psychometric properties?

Anna Y Leung (University Hospital, Ludwig-Maximilians-University of Munich)*; Xiaoshu Wu (Munich Center of the Learning Sciences, Ludwig-Maximilians-University of Munich); Xenia Schmalz (University Hospital, Ludwig-Maximilians-University of Munich)

Reading-related cognitive skills and family literacy environment mediate the relation between parents' reading history and their children's reading outcomes

Xianglin Zhang (University of Maryland College Park)*; Hua Shu (Beijing Normal University); Zhichao Xia (University of Connecticut); Min Wang (University of Maryland College Park)

N400 amplitude as an index of image integration into sentence contexts in adolescents

Marina Norkina (Sirius University of Science and Technology)*; Anna Rebreikina (Sirius University of Science and Technology); Alexandra Berlin Khenis (Sirius University of Science and Technology); Elena Semenova (Sirius University of Science and Technology); Anastasia Streltsova (Sirius University of Science and Technology); Tatiana Logvinenko (Sirius University of Science and Technology)

Adaptation, Translation, and Validation of ‘Child Language Experience and Proficiency Questionnaire’ (Child LEAP-Q) in Kannada

Essentially all children in India are bi/multilingual with exposure to more than one language. Evaluation of language proficiency in bi/multilingual children, therefore, is necessary to assess the language status reliably. The LEAP-Q¹ enables gathering information on language competency and experience data for the number of spoken languages by an individual. LEAP-Q was adapted to collect language information from parents about their children. However, there is a lack of tools for assessing language proficiency in children in the Indian context. The current study, thus, aimed to adapt, translate, and validate the child LEAP-Q to Kannada. After obtaining consent from the author(s) of the original tool, the forward-backward translation method was employed to perform linguistic adaptation. The modified and translated version of child LEAP-Q was given to nine speech pathologists (SLPs), parents, and teachers to examine the sociocultural appropriateness of items. Later, the questionnaire was administered on 50 parents of bilingual children for validation and readministered on 28 parents (between 15 to 30 days after the initial administration) to assess the test-retest reliability. Responses from the participants were further tabulated and subjected to appropriate statistical analyses to determine the tool's psychometric properties. The inter-rater reliability statistics for the Kannada version of Child-LEAP Q revealed a substantial agreement among parents, teachers, and SLPs (Fleiss' Kappa $k=0.87$, $p < 0.005$). The scale further showed an overall high internal consistency ($\alpha = 0.971$) and excellent test-retest reliability (ICC = 0.993) at par with the original and adapted versions in various languages². The Kannada version of the Child LEAP-Q, thus, demonstrates good reliability and validity, and can be used as a tool to quantify the experience and proficiency of Kannada-speaking bilingual children for clinical and research purposes.

Keywords: bilingual, language proficiency, children, Kannada

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2. Marian V, Hayakawa S. Measuring bilingualism: The quest for a “bilingualism quotient”. *Applied Psycholinguistics*. 2021 Mar;42(2):527-48.

Does the contextual information in test items influence English morphological awareness measures' psychometric properties?

In psycholinguistic studies, recent reviews (e.g., Apel, 2014) called for valid cognitive tests of morphological awareness (MA), a multidimensional metalinguistic skill associated with literacy development. Since MA requires readers to understand morphemic words' meanings, some tests use contextual cues to activate semantic retrieval. As reading comprehension abilities might facilitate the processing of items with contextual information, we questioned whether the contextual information in MA measures affects item difficulty. In our pre-registered online experiment, 102 L1 and L2 English-speaking adult readers completed a set of MA items with four types of contextual cues (short text, single sentence, picture, word analogy) and a standardised reading comprehension test. Our generalised logistic mixed-effects regression (GLMER) analysis showed that participants' reading comprehension ability had a significant effect on item difficulty. Word analogy items had the lowest item difficulty, suggesting that different MA test item types have varied validity. Our study casts new light on disseminating how items' linguistic features and MA's multifaceted nature influence the test's validity. We also call for developing MA measures with improved construct validity and individual difference differentiation.

Keywords: morphology, experimenter-designed tasks, psychometric testing, item analysis, English as a foreign language (EFL)

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Apel, K. (2014). A comprehensive definition of morphological awareness: Implications for assessment. *Topics in Language Disorders*, 34(3), 197–209.

**Reading-related cognitive skills and family literacy environment mediate the relation
between parents' reading history and their children's reading outcomes**

Abstract

Previous studies in alphabetic languages have shown that reading-related cognitive skills (e.g., phonological awareness (PA) and rapid automatized naming (RAN)) mediate the relation between parents' reading history and their children's reading outcomes (Esmaeeli et al., 2019; Vandermosten et al., 2017). Research also suggests that the role of specific reading-related cognitive skills (e.g., morphological awareness (MA)) in reading development varies across languages. Yet it is uncertain if these cognitive skills mediate the intergenerational transmission from parents' reading history to their children's reading outcomes. Eighty-nine native Mandarin-speaking children (age = 10.30 ± 0.72 years, 45 girls) were recruited. We assessed parents' reading history using a Chinese version of the abbreviated Adult Reading History Questionnaire (Feng et al., 2021). We examined children's reading outcomes in terms of character recognition, oral reading fluency, and silent reading comprehension, as well as reading-related cognitive skills (PA, RAN, and MA). Family literacy environment was assessed including social economic status (SES, parental education and income), and number of adults' and children's books at home. Path analyses showed that parents' reading history, on the one hand, influenced children's reading outcomes via RAN. On the other hand, it affected environmental factors (SES and number of children's books), which further had an influence on children's MA, and finally impacted their reading outcomes. It seems that parents' reading history may have a differential effect on reading-related cognitive skills. These findings contribute to our better understanding of the complex relationships between heredity, environment, reading-related cognitive skills and reading outcomes.

KEYWORDS: Chinese, cognitive skills, family literacy environment, parental reading history, reading, mediation

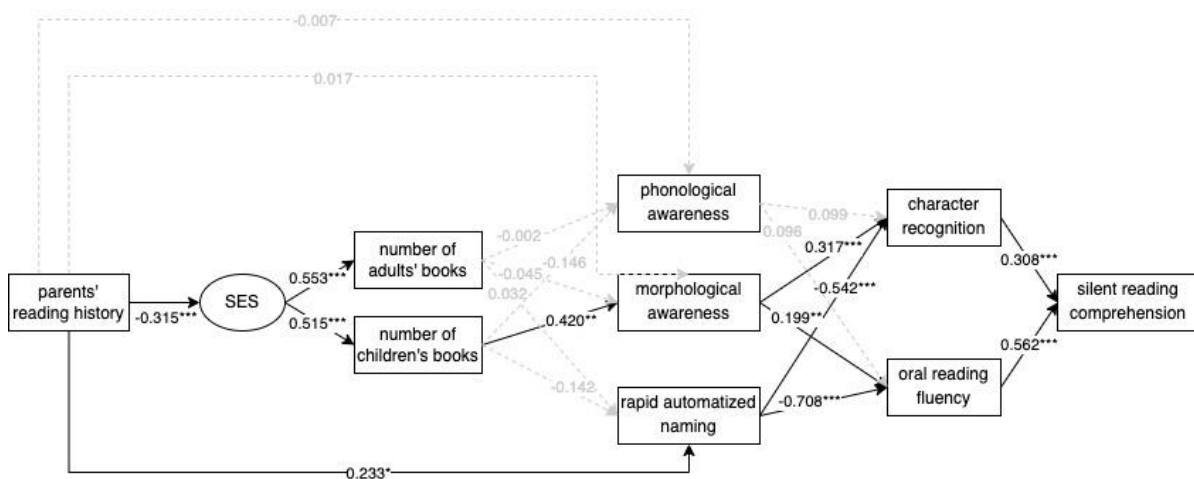
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Appendix

Figure 1

The sequential path analysis examining the mediation role of the environmental and reading-related cognitive factors on the effects of parents' reading history on their children's reading outcomes.



Note. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$. Standardized parameter estimates of significant paths are displayed. Black and solid lines represent a significant path coefficient ($p < 0.05$), while grey and dotted lines represent a non-significant path coefficient.

N400 amplitude as an index of image integration into sentence contexts in adolescents

Reading comprehension always takes place in context. It is necessary to integrate information from the context, which may include not only verbal, but also visual information. Federmeier and Kutas (2001) showed that, when performing a task to determine whether a final word or image of a sentence fits its meaning, adults did not demonstrate different N400 amplitudes to congruent stimuli in constraining context in comparison to non-constraining context. Thus, it has been shown that context constraint does not provide an advantage in tasks involving the semantic integration of predictable elements into a sentence. On the other hand, EEG studies in adolescents show that the text or sentence constraint influences word meaning retrieval during reading making it easier or harder to incorporate with the previous text and comprehend (Borovsky et al., 2010, 2012; Lowell & Morris, 2017; Vergilova et al., 2022). We expect that in adolescence, the age of intensive learning and the formation of new semantic representations, rather than in adults, context constraint will influence the processes of integration of congruent information. In previous studies verbal information as words were investigated while visual images were not covered. Therefore, the aim of this study is to examine the influence of contextual constraint on the amplitude of the N400 component during visual image perception and its integration into the context of the sentence in adolescents.

Here, we report the preliminary results of an ongoing study. The data from 65 adolescents aged 12-17 years are available at present. EEG (128 channels) was recorded while participants read sentences with high and no constraint context, after which they decided whether the images presented after the sentence matched its meaning (240 sentences). ERPs to the pictures were averaged in the interval from -200 to 1500 ms, the mean amplitude of the N400 component was analysed in the interval 250-450 ms in the fronto-central electrodes.

We found, that the contextual constraint modulated the neurophysiological response in a highly-constraining context, the amplitude of the N400 component on the visual image following the sentence was smaller ($F(1,64)=6.073$; $p=0.0164$) than non-constraining context. These data suggest that in adolescents, the type of context influences visual-verbal integration of information; the constraining context facilitates the prediction of possible information, which is reflected in a decrease in the N400. In a high constraint context, adolescents find it easier to integrate visual and verbal information than in no constraint contexts.

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12:10 - 13:10 Session F (4 talks)

Structural priming in Mandarin-English late bilinguals: The role of language direction and language proficiency

Vera Xia (University of Alberta)*; Johanne Paradis (University of Alberta); Juhani Jarvikivi (University of Alberta)

Long-lag lemma repetition priming in Estonian and Finnish text reading: evidence from the MECO corpus

Kaidi Lõo (University of Tartu)*; Raymond Bertram (University of Turku); Victor Kuperman (McMaster University)

Parsing ambiguous trimorphemic words in sentence contexts: Evidence from RSVP

Amanda Araujo White (Concordia University)*; Kyan Salehi (Concordia University); Roberto G de Almeida (Concordia University)

Morphological learning in an online language app: Evidence from Lingvist users

Jordan Gallant (McMaster University)*

Structural priming in Mandarin-English late bilinguals: The role of language direction and language proficiency

Syntactic repetition aids syntactic processing. Studies on structural priming in bilinguals have found that the processing of a structure (the *target*) is facilitated by the speaker having processed the same structure previously (the *prime*), whether the prime and target are in the same or different languages (Mahowald et al., 2016). However, the presence and magnitude of priming in bilinguals varies depending on whether the prime/target is in the L1/L2 (Loebell & Bock, 2003; Schoonbaert et al., 2007), and also scales with L2 proficiency (Hartsuiker & Bernolet, 2017). This pilot study investigates how structural priming in Mandarin-English late bilinguals is affected by these factors.

Thirty L1-Mandarin, L2-English bilinguals with an age of arrival >10 years in Canada/the U.S. completed a timed aural grammaticality judgment task. There were 72 targets and 72 fillers, in a mixture of Mandarin and English. The targets were three transitive alternations: active (**1a–b**), passive with preverbal agent (**2a–b**), and passive with postverbal agent (**3a–b**). Each sentence served as the potential prime for the next sentence. Reaction times and binary grammaticality judgments (good/bad grammar) were analyzed. L2 proficiency was measured using a sentence repetition task. Research questions were:

1. *Do late bilinguals demonstrate structural priming both within and between languages?* Both within- and between-language priming were expected, as found in previous studies.
2. *How does L2 proficiency moderate structural priming?* Higher L2 proficiency was expected to correlate with stronger priming, as found in previous studies.
3. *Do reaction times and judgments both show priming effects?* Reaction times were expected to show priming due to being an implicit measure. Binary judgments might be too discrete or explicit to receive facilitation in processing.

For reaction times, a linear mixed-effects model indicated no significant effect of prime (structure match of the previous stimulus) ($p > .05$) or language match of the previous stimulus ($p > .05$), but a significant interaction ($p < .01$). Further pairwise comparisons indicated the language-matched, primed condition was processed faster than the two non-language-matched conditions ($p < .001$), as well as the language-matched, non-primed condition ($p < .05$) (**Figure 1**). That is, within-language priming (L1–L1 and L2–L2) occurred, while between-language priming (L1–L2 and L2–L1) did not occur. L2 proficiency did not affect reaction times or interact with priming. For grammaticality judgments, a generalized additive mixed model found no significant priming-related effects/interactions ($p > .05$).

The results indicate the following. First, late bilinguals can be primed within languages, at least in terms of reaction times. However, some might not be able to be primed between languages. Hartsuiker and Bernolet (2017) propose that similar syntactic structures are only shared across the L1 and L2 systems at higher proficiencies, resulting in a lack of between-language priming in less-proficient bilinguals; it is possible that these participants were not proficient enough in the L2. Second, the role of L2 proficiency in structural priming in this study is inconclusive. Third, reaction times are likely a more sensitive measure of priming than binary judgments, which may be too discrete or explicit to be primed. For future research, my proposed extension of this study to include heritage speakers is expected to clarify the role of language direction and language proficiency.

Examples

1. a) The hero saved that city. *Active*
b) Nainai chi le na-kuai dangao.
grandma ate ASP that-CL cake
'The grandma ate that cake.'
2. a) ?That city was by the hero saved. *Passive, preverbal agent*
b) Na-kuai dangao bei nainai chi le.
that-CL cake BEI grandma eat ASP
'That cake was eaten by the grandma.'
3. a) That city was saved by the hero. *Passive, postverbal agent*
b) ?Na-kuai dangao chi le bei nainai.
that-CL cake eat ASP BEI grandma
'That cake was eaten by the grandma.'

Figures

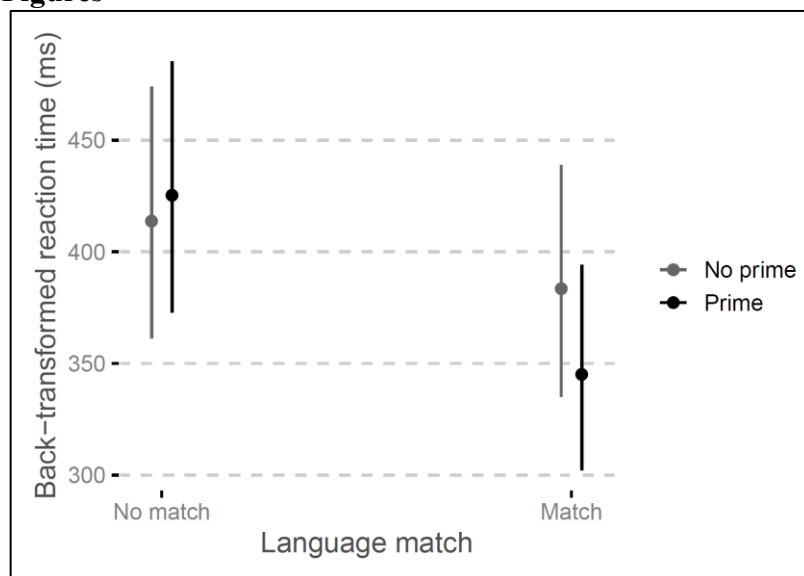


Figure 1: Mean reaction times in the grammaticality judgment task, broken down by whether the previous stimulus was the same structure and same language as the current (target) stimulus.

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Long-lag lemma repetition priming in Estonian and Finnish text reading: evidence from the MECO corpus

It has been well established that inflectionally related words prime each other in priming studies with single words (e.g., Raveh & Rueckl 2000, Stanners et al. 1979). For instance, a word such as *cat* is read faster when it is preceded by its plural form *cats*. Does such lemma repetition priming also emerge in natural text reading, where related inflected forms are in the context and they do not immediately follow each other?

So far only a few recent studies have investigated this particular question. For example, Kamienkowski et al. (2018) analyzed an eye-tracking corpus of L1 Spanish passage reading. They reported no change in processing times in either an inflected form following its base form or a base form occurring after its inflected form. Another study by Coskun (2022) also reported no lemma repetition priming in L1 English and Dutch text reading. However, both these studies analyzed morphologically relatively simple languages. The current study investigates long-lag lemma repetition in Estonian and Finnish, two languages with very rich inflectional morphology and inflectional paradigms consisting of dozens of different variants.

The data for the current study was extracted from the Multilingual Eye-movement Corpus (MECO) containing eye-tracking data on reading Wikipedia style texts from 13 languages (Siegelman et al. 2022). We selected all nouns from Estonian (n=643) and Finnish (n=596) texts, read by 52 and 49 native speakers, respectively. Using regression analyses, we examined the effect of lemma repetition on gaze duration in both languages, while controlling for text ID, sentence number, word length and word frequency.

We found that reading time of a word was faster when its lemma had already occurred in the text compared to when it had not (Estonian: $\beta=-33.39$, $t=-6.36$, $p<0.0001$; Finnish: $\beta=-22.74$, $t=-4.64$, $p<0.0001$). Second, lemma repetition also interacted with word frequency in such a way that an infrequent word was read particularly slowly when its lemma had not occurred in the text before (see Figure 1).

These results suggest that inflectional variants of a particular word get and remain activated for a long time even when the context is present. They also fit with results from a recent production study of Estonian connected speech which reported that paradigm relations influence acoustic durations of words even when the context is available (Lõo et al., 2023). However, the effect of long-lag lemma repetition priming may be language-specific. It may surface only in morphologically rich languages where the support from inflectional paradigms is most beneficial for the language user.

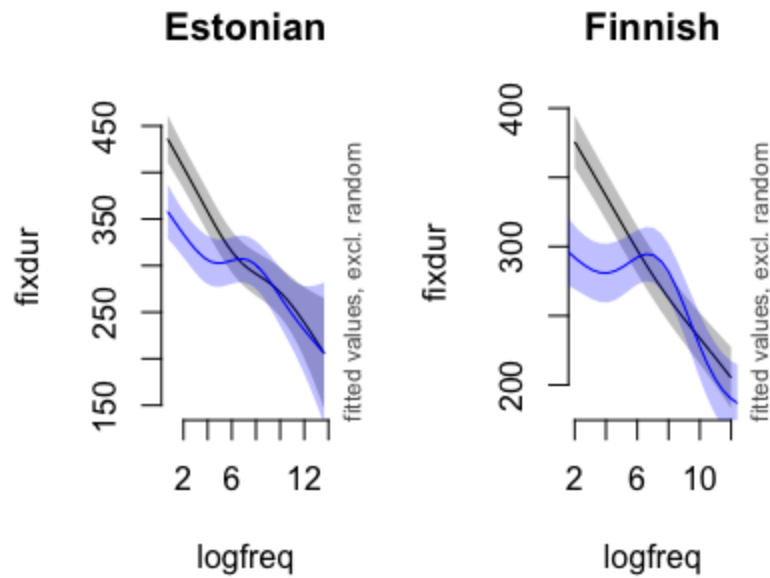


Fig 1: Interaction between word frequency and lemma repetition, blue - lemma repetition, black - no lemma repetition.

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Parsing ambiguous trimorphemic words in sentence contexts: Evidence from RSVP

How are morphologically complex words recognized and interpreted during language comprehension? We investigated the role that sentence context plays in the morphological analysis of ambiguous trimorphemic words (e.g., *unlockable*), which can be interpreted either with a right-branching structure (*[un[lockable]]*, meaning “not able to lock”) or a left-branching structure (*[[unlock]able]*, meaning “able to unlock”). Using a rapid serial visual presentation (RSVP) task, native English speakers (N=19) were presented with sentences at a rate of 12 words per second, with words being presented one-by-one in the middle of the screen. We induced morphological parsing by presenting the ambiguous trimorphemic words off-centre, with the foveation (fixation) point coinciding with either the prefix-root (*un+lockable*) or root-suffix positions (*unlock+able*). Participants’ task was to judge the sentence’s semantic plausibility and to recall the sentence. We hypothesized that if context influences parsing, plausibility judgements would be more accurate and faster and recall higher when the sentence context matched the induced visual split. Our analyses yielded no difference in recall and plausibility judgments, suggesting that morphological parsing is initially insensitive to sentence context. We acknowledge our study's limitations, including the small sample size and potential issues with the experimental materials. Future research should address these shortcomings.

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Morphological learning in an online language app: Evidence from Lingvist users

This research explores the acquisition of morphological knowledge in the context of asynchronous online language learning, using extensive real-world data from the app Lingvist (www.lingvist.com). The learning task in this app involves reading a context sentence in the target language and completing the missing target vocabulary item using a complete gloss sentence in the source language, including both morphologically complex and simplex items.

We investigate the effects of the type frequency of encountered suffixes on the future production of targets containing those suffixes, distinguishing it from token frequency effects. To determine the role of morphosemantic knowledge in these learning processes, we additionally investigated the type and token frequency effect of three-letter sequences in the final rime of morphological simplex words that, by definition, had no morphological or semantic structure.

The analysis of user data from 3902 Spanish-speaking and 7115 German-speaking learners of English revealed a significant facilitatory effect of type frequency, but not token frequency, for English suffixes. This suggests that exposure to suffixes in various morphological contexts improved production accuracy, while repeated exposures to suffixes in the same contexts did not provide the same benefit. Interestingly, we observed similar effects when investigating repeating orthographic patterns in the rime of morphological simplex words, as the type frequency of orthographic patterns was greater when they were phonologically consistent.

These findings imply that the morphological learning effect may be primarily driven by surface-level orthographic and phonological forms rather than deeper semantic or morphological structures. We discuss these results in relation to the acquisition of additional language literacy and writing skills, as well as their contribution to our understanding of morphological knowledge from a psycholinguistic perspective.

14:25 – 15:25 Session G (4 talks)

Unpacking the role of pronouns in children's reading comprehension

Emilie Courteau (Dalhousie University)*; Guillaume Loignon (University of Québec at Montréal (UQAM)); Héléne Deacon (Dalhousie University)

Prosodic Sensitivity and Reading in Bilingual Children

Krystina Raymond (Ontario Institute for Studies in Education at the University of Toronto)*; Menghsun Lee (Ontario Institute for Studies in Education at the University of Toronto); Kathleen Hipfner-Boucher (Ontario Institute for Studies in Education at the University of Toronto); Héléne Deacon (Dalhousie University); Jeffrey Steele (University of Toronto Mississauga); Becky Chen (Ontario Institute for Studies in Education at the University of Toronto)

The Effect of Vowelization on Visual Word Recognition in Arabic

Maram Alharbi (University of Texas at Arlington)*; Jeffrey Witzel (University of Texas at Arlington); Naoko Witzel (University of Texas at Arlington)

Symbols to Shapes Processing

Ghadir Nassereddine (University of Windsor)*

Title: Unpacking the role of pronouns in children's reading comprehension

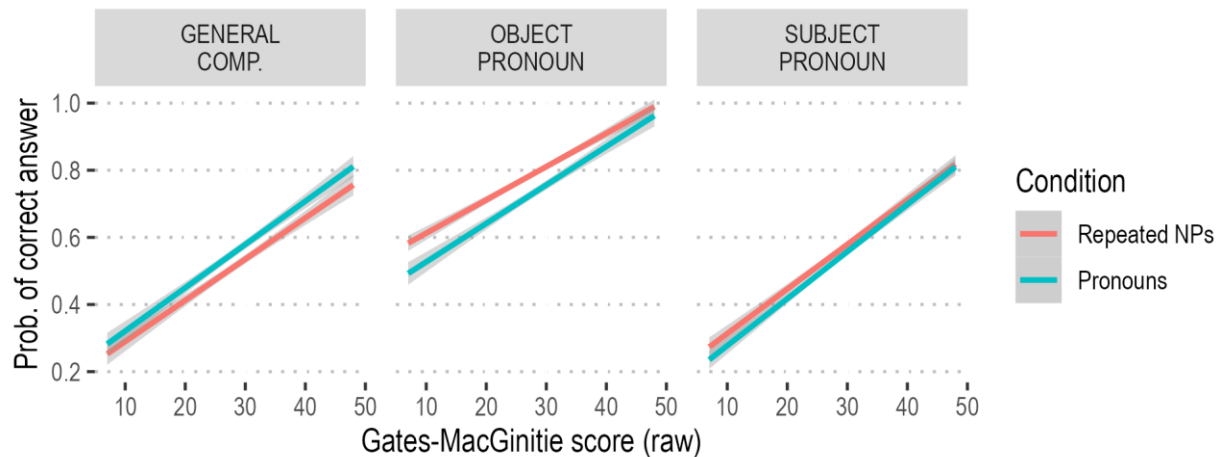
Currently, there is no consensus on the impact of pronouns on reading comprehension in children. The repeated name penalty^{1,2} suggest that using pronouns instead of repeating noun phrases (NP) facilitates reading comprehension in some syntactic contexts. In contrast, the cohesion effect^{3,4} posits that using pronouns instead of repeating NPs could negatively affect comprehension in students depending on their reading level. Our study looks at how reading proficiency and the syntactic context of substituted NPs affect reading in children.

240 five-grade English-speaking children read two texts⁵, one with pronoun intact structures (Pronouns condition, e.g. 'At last Fulton's steamboat was finished. They called it...') and one with pronouns replaced by referents, i.e., NPs (Repeated NPs condition: e.g., 'The steamboat had a paddle wheel on each side. The steamboat could...'). They answered 8 questions for each text: 4 items focused on general reading comprehension and 4 on pronoun comprehension. Within the pronoun comprehension items, 3 targeted the grammatical context of sentence subject and one the sentence object. Students reading level was assessed with the standardized Gates-MacGinitie Reading Tests⁶.

We used a mixed-effects logistic model to examine success in reading comprehension items as influenced by condition (pronouns or repeated NPs), text, item type (general comprehension, object pronoun, subject pronoun), and standardized reading score, with participant as random effect.

Preliminary results (Fig.1) showed that, for general comprehension items, students with average reading scores displayed a slight advantage in the Pronouns condition. For object pronoun items, students with lower reading scores performed better in the Repeated NPs condition. For subject pronoun items, we found no significant difference between conditions. We will discuss how both syntactic context of pronoun replacement and reading proficiency influence children's reading comprehension.

Figure 1. Relation between estimated probability of correct answers and reading scores, by item types and conditions



Note. 240 five-graders participated in this study. We removed 14 participants from the analyses as they did not complete both conditions. We present the data for $n = 226$, responding to 8 items per text across 2 conditions. Probability of correct answers estimated using a mixed-effects logistic regression model. Shaded areas around the lines indicate 95% confidence intervals.

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Prosodic Sensitivity and Reading in Bilingual Children

Prosodic sensitivity, defined as the ability to identify and manipulate speech patterns through timing, melody, and intensity is multi-faceted (Holliman et al., 2014; Wood & Terrell, 1998). It includes several aspects of rhythm comprising word stress, phrase stress and intonation. This study aims to examine how different aspects of prosodic sensitivity are related to reading in English and French. A total of 106 bilingual children, aged 6 to 9 years old, from public schools located in a large metropolitan city in Canada participated in this study. Prosodic sensitivity was measured in English via three tasks, word-level, phrase-level, and intonation. Parallel phrase-level and intonation tasks were created in French by the authors. To measure word-level prosodic skills, children were asked to listen to the stress patterns of a known word and to identify the item in a picture. Phrase-level skills were assessed by presenting children with an image and asking them to listen to two separate audio recordings. Each audio-recording used a repetitive sound (“dee” or “DEE”) to replace the stress patterns of a known phrase and children were asked to identify the correct pattern. Intonation skills were assessed by having children listen to an audio-recording and identify if it sounded like a statement or a question. The results showed that the prosody measures had good reliabilities and were correlated with each other. Confirmatory factor analysis (CFA) revealed that prosodic sensitivity in English confirmed that the best goodness-of-fit was a three-factor model and in French the best goodness-of-fit was a two-factor model suggesting word stress, phrase stress, and intonation are three separate skills. Additionally, hierarchical regressions analyses showed that English word stress and phrase stress significantly predicted English word reading. None of the French prosodic sensitivity measures predicted French word reading. Implications for further research and instruction for English-French bilingual students are discussed.

The Effect of Vowelization on Visual Word Recognition in Arabic

This study examines how vowelization affects lexical processing in Arabic. In Arabic, vowelization signs are a type of diacritic that adds vowel information onto a predominantly consonantal script, making the grapheme-phoneme connection transparent and clear. However, vowelization signs are typically omitted from print, and skilled adult readers read unvowelized texts with no difficulty. Previous research on vowelization has shown conflicting results, with some studies indicating that vowelization leads to faster reading and better reading accuracy and comprehension (Abu-Rabia, 1997, 1998; Shimron & Sivan, 1994), while other studies indicate higher accuracy and faster reading for unvowelized words (Schiff & Saiegh-Haddad, 2017; Taha, 2016). Many of these studies, however, have required participants to read aloud, which does not provide clear indications of processing at the earliest stages of visual word recognition (Coltheart et al., 1993). In this study, a lexical decision task with masked priming was employed to test the role of vowelization during the initial stages of Arabic lexical processing. Three priming conditions were tested with unvowelized targets (مَحْتَرَف) – an unvowelized repetition prime (مَحْتَرَف), a repetition prime with correct vowelization (مُحْتَرَف), and a repetition prime with incorrect vowelization (مَحْتَرَف). We predicted that if vowelization facilitates lexical processing during the initial stages of visual word recognition, there should be a larger priming effect for the correctly vowelized condition than for the unvowelized condition. Furthermore, there should be a larger priming effect for the correctly vowelized condition compared with the incorrectly vowelized condition. However, if vowelization does not play a major role in the initial stages of word recognition, there should be comparable priming effects across conditions, and for the correctly vowelized and incorrectly vowelized conditions in particular. Results from adult native Arabic speakers ($N = 56$) indicated that while all three conditions revealed significant priming effects, the unvowelized condition yielded a larger effect than both the correctly vowelized and incorrectly vowelized conditions. Furthermore, there was no difference in the priming effects for the correctly vowelized and incorrectly vowelized conditions. This indicates that even though vowelization signs make the phonology of Arabic words more transparent, this information does not contribute to the earliest stages of visual word recognition in skilled readers of this language. The results of this study will be interpreted in relation to the processing of diacritics in other languages (such as French, Spanish, and Japanese), and the role these markers play during lexical access in these languages.

Table. Mean reaction times (expressed as millisecond equivalents of the inverse-transformed estimated marginal means) for related and unrelated primes in each priming condition. The example primes are for the target محترف.

	Unvowelized		Correctly Vowelized		Incorrectly Vowelized	
Related	محترف	532	مُحْتَرِفٌ	549	مِخْتَرُفٍ	546
Unrelated	تعديل	592	تُعَدِّلُ	592	تُغَدِّلُ	595
Priming		60***		43***		49***

*** $p < .001$

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Symbols to Shapes Processing

It is well supported that people are more likely to associate the non-word *bouba* with a round shape, and *kiki* to a sharp shape, an effect known as the Bouba/Kiki (BK) effect (Ramachandran & Hubbard, 2001). This effect has not been examined extensively in Arabic. In 2022, our goal was to evaluate the contributions of grammatical gender and sounds on the BK effect in Arabic. One of the tasks was a letter task where Arabic speakers were presented with analogs of the English 3 sharp and 4 round-sounding letters (Nielsen & Rendall, 2011) based on similarity in sound, 4 filler letters were also added. One letter was presented once at a time with a *bouba* and a *kiki* shape on opposite sides of the screen below it. Participants selected the shape they thought best matched the letter. We expected participants would match the *kiki* shape with the sharp-sounding letters, and the *bouba* shape for the round-sounding letter, similar to participants' performances in other languages. However, we found that participants showed a tendency to select *bouba* over *kiki* for all three types of letters. Hence, the next step was to re-evaluate which Arabic letters are associated with the *kiki* and *bouba* shapes. 30 Arabic speakers were presented with the Arabic alphabet. Half of the participants were presented with the stimuli visually, and the others auditorily. On the screen, participants also saw a scale with the *bouba* and *kiki* shapes on opposite sides of it. Participants were instructed to rate the letter they were presented with by determining where it lies on the scale. The study had three goals. The first was to evaluate the sharpness or roundedness of all 28 Arabic letters. The second was to evaluate the effect of orthography on shape selection with the visual stimuli. The third goal was to observe the effect of phonology on shape selection with the auditory stimuli.

Results showed that there are 3 Arabic letters that are both visually and auditorily sharp, and 4 visually and auditorily round. The same study will be replicated with English speakers. The purpose would be to control for previous knowledge of the sound of the letter (when presenting the letter visually), and to control for knowledge of the shape of the letter (when presenting the letter auditorily). Subsequent experiments will also be designed to investigate the influences of phonology and orthography on the BK effect, in addition to semantics. Understanding the BK effect in Arabic is important because this effect is universal but under-researched in Arabic. In addition, language influences how we perceive the world. Hence, it is important to understand how we process it.

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Poster Schedule

Poster Session 1 – Friday Morning

01. Beyond the Bread: Uncovering the Mechanisms of Sandwich Priming in Word Recognition	Maria Fernández-López (University of València)*; Steve Lupker (University of Western Ontario); Pablo Gomez (Skidmore College); Melanie Labusch (Universitat de València); Colin J Davis (University of Bristol); Manuel Perea (University of València)
03. Conceptual transfer in motion lexicalization by L1-Portuguese/FL-English bilinguals	Renan C Ferreira (UFPEL)*
04. How words can guide your eyes: Increasing engagement with art through audio-guided visual search	Lea A Müller Karoza (Scene Grammar Lab, Goethe University, Frankfurt)*; Naomi Vingron (Scene Grammar Lab, Goethe University, Frankfurt); Nancy Azevedo (Center for Interdisciplinary Research in Rehabilitation of Greater Montreal (CRIR – Jewish Rehabilitation Hospital (JRH) of the CISSS de Laval)); Aaron Johnson (Department of Psychology, Concordia University); Melissa Vo (Goethe University Frankfurt, PEG Allgemeine Psychologie I); Eva Kehayia (School of Physical and Occupational Therapy, McGill University)
05. KNIVE-knives: Inflection and Lexical Cloning	John A Hotson (University of Edinburgh)*
06. L1 ≠ L2 = L3: Differential social normativity in first vs later-acquired languages	Michał B. Paradowski (Institute of Applied Linguistics, University of Warsaw)*; Marta Gawinkowska (Institute of Applied Linguistics, University of Warsaw)
07. The effect of idiomatic co-occurrence on lexical networks	Simone A Sprenger (University of Groningen)*; Sara Beck (University of Tübingen); Andrea Weber (University of Tübingen)
08. Leveraging Social Network Data to Ground Multilingual Background Measures: Validating Entropy Part 1	ANTONIO INIESTA (McGill University)*; Michelle Yang (McGill University); Anne Beatty-Martinez (UCSanDiego); Inbal Itzhak (Canadian Consortium on Neurodegeneration in Aging (CCNA)); Jason Gullifer (Marianopolis College); Debra Titone (McGill University)
09. The role of orthography and phonology during L1 vs. L2 typewritten production	Merel Muylle (Ghent University)*; Gonia Jarema Arvanitakis (Université de Montréal and Centre de Recherche de l'Institut universitaire de la gériatrie Montréal)
10. Context modulates word integration strategies in ambiguous idioms	Marta Vergara (Universitat de Valencia)*; Teresa Civera (Universitat de Valencia); Eva E. Gutierrez-Sigut (University Of Essex)
11. Semantic Intercorrelation Facilitate the Effect of Semantic Richness on Language Production	Keyi KANG (Centre for Cognitive and Brain Sciences & Department of Psychology, University of Macau)*; Sifan ZHANG (Centre for Cognitive and Brain Sciences & Department of Psychology, University of Macau); Haoyun ZHANG (Centre for Cognitive and Brain Sciences & Department of Psychology, University of Macau)

12. Deciphering the Intricacies of (Misspelled) Logotype Identification via Event-Related Potentials	Melanie Labusch (Universitat de València)*; Manuel Perea (Universitat de València); Francisco Rocabado (Universidad Nebrija); Maria Fernández-López (University of València); Ana Marcet (Universitat de València); Marta Vergara (Universitat de Valencia)
13. 'Die laughing' as a Discourse Marker of Sarcasm: Its Uses in Social Media Corpus During the Covid-19 Pandemic in Taiwan	Yan-ping Lai (National Chenchi University); Yu-Che Yen (National ChengChi University); Siaw-Fong Chung (National Chengchi University)*
14. The role of sublexical and lexical skills in children learning to read in a transparent orthography. Implications for reading instruction	Joana Acha (Universidad del País Vasco)*; Gorka Ibaibarriaga (Universidad del País Vasco); Manuel Perea (Universitat de València)
15. Thermal and Metaphorical Meanings: Analysing Temperature Adjectives in European Portuguese	Yichang Ge (University of Porto)*; Fátima Silva (University of Porto); Oliveira Fátima (University of Porto)
16. An ontology of democracy: A cognitive linguistic analysis	Ilona Brovarska (V. N. Karazin Kharkiv National University)*
17. Syllabification in Hindi: An Intuitive mental process	Rita Mathur (Bharati Vidyapeeth University)*
18. Affix substitution in Indonesian: A study of functional load	Karlina Denistia (Universitas Sebelas Maret)*; Harald Baayen (University of Tuebingen)

Beyond the Bread: Uncovering the Mechanisms of Sandwich Priming in Word Recognition

Forster and Davis's (1984) masked priming technique (#####-judge-JUDGE) is a key tool for investigating the initial stages of visual-word identification, allowing researchers to manipulate the relationship between a heavily masked and briefly presented (≈ 50 ms) prime and a target item. Unfortunately, effect sizes are often small and not sensitive to subtle manipulations. To magnify the size of priming effects, Lupker and Davis (2009) introduced the sandwich technique by adding a pre-prime (≈ 30 ms), identical to the target, between the mask and the prime of interest (#####-JUDGE -judge-JUDGE). However, the mechanisms underlying this boost are still poorly understood (i.e., does it reflect quantitative or qualitative changes?), probably because the comparisons involved different groups of participants. Recently, using a within-subjects design, Fernández-López et al. (2022) directly examined the differences between identity vs. unrelated primes with the standard and sandwich techniques. They showed that the boost of priming effects in the sandwich technique was not only due to faster responses in the identity condition but also to slower responses in the unrelated condition. However, sandwich priming was devised to boost the effects in more subtle manipulations than identity priming. To fully characterize the technique, we conducted two lexical decision experiments with sandwich and standard priming methods in a within-subject design. We examined transposed-letter and orthographic-letter priming. Results showed an overall boost in masked priming effects for the sandwich method. Moreover, the cross-method comparison revealed the source of that boost: the sandwich technique sped up the related conditions (judge-JUDGE; judge-JUDGE), produced no differences on loosely related pairs (jupte-JUDGE), and slowed down responses in the unrelated conditions (olive-JUDGE). We discuss the theoretical and methodological implications of these results.

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Reliability of Visual and Auditory Processing Tasks in Dyslexia Research

Dyslexia research encompasses numerous theories and empirical investigations focusing on the cognitive deficits that underlie reading difficulties. While existing theories propose specific deficits, to date, there is no consensus about the causes of dyslexia (Snowling et al., 2020). In part, this is because of the inconsistent empirical findings. Inconsistency, in turn, could be attributed to the heterogeneity of dyslexia phenotypes and multifactorial nature of the disorder (Parrila & Protopapas, 2017), but also – to methodological issues, such as low reliability of tasks (e.g., Luniewska et al., 2018; Arnon, 2020). In the current study, we aim to empirically assess psychometric reliability of several tasks widely used in research of perceptual theories of dyslexia.

This is a report of the empirical study in progress. We plan to obtain 200 datasets from children in 3rd and 4th grades, German native-speakers, on a series of visual and auditory processing tasks. Visual and auditory processing tasks include: (1) rise time and frequency discrimination replicating Goswami et al. (2011, 2010), (2) auditory and visual temporal order judgement replicating Landerl & Willburger (2010), visual-spatial attention tasks replicating Bertoni et al. (2021), coherent motion detection task modelled after studies testing the Magnocellular-Dorsal theory (e.g., Stein, 2014). In addition to the experimental tasks, we are assessing children's reading ability using the SLS 2-9 fluency screener (Wimmer & Mayringer, 2019) and performance in control tasks – phonological awareness task, simple and choice reaction time task.

Given the rise of popularity of online studies, the first experimental session is implemented in online format using *Pavlov.org* platform. Each child performs two sessions: half of them do both sessions online, and the second half do the first session online and the second session in the lab. As of the date of submission, we have collected the 158 datasets for the first online session, and 77 datasets for the second session in the lab. The distribution of the reading ability assessed during a session in the lab is as follows (standardized scores): *Mean (SD)* = 108.4 (14.9) with 2.6% of the sample demonstrating poor reading ability, 9.1% – below average, 41.6% – average, 23.4% – above average, 16.9% – good, and 6.5% – very good reading according to the SLS 2–9 criteria. We are currently preparing the analytical pipelines and continue recruitment to reach 100 datasets for in-lab assessment and have a better representation in the sample of the lower end of reading ability distribution.

We will report the preliminary results on: (1) Test-retest reliability as well as internal consistency (for item-based tasks) and psychometric function (for psychophysical tasks) of the tasks in question. If the reliability proves to be insufficient, we will discuss recommendations for improving the psychometric properties before using these tasks in further studies on correlates of reading ability and dyslexia. (2) Association between the performance in the perceptual tasks and reading ability. This allows us to partially assess the stability of the effects reported in previous studies. In addition, we will make our study materials available (including experimental scripts and stimuli) and share insights on the feasibility of the online dyslexia/reading studies with children as participants.

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Title: Conceptual transfer in motion lexicalization by L1-Portuguese/FL-English bilinguals

Background: Languages do not lexicalize concepts in the same way (Pavlenko, 2014). With regard to motion lexicalization, English is a satellite-framed language (Talmy, 2000) lexicalizing Path in satellites and Manner in the main verb (e.g., 'He walked across the street'). Even though Manner is not a mandatory element in motion expression, its lexicalization in the verb makes it readily accessible, leading languages such as English to express it more frequently. Verb-framed languages, on the other hand, typically express Path in the main verb and omit Manner, which is only lexicalized if the speaker perceives it as salient. This is the case in Portuguese (e.g., 'Ele atravessou a rua' - as he probably did it by walking, the lack of perceptual salience makes Manner unnecessary; 'Ele atravessou correndo' - Manner is less typical and, therefore, more salient in the speaker's perception, leading to its expression with the addition of an adjunct). When languages do not lexicalize concepts with the same type of construction, bilinguals may be influenced to express themselves in one of their languages as they would in the other, a phenomenon known as conceptual transfer. This study explores this type of transfer, examining how native Portuguese speakers learning English as a foreign language (EFL) express motion events. We aim to uncover the impact of this cross-linguistic influence on language learners and demonstrate the importance of investigating bilingual cognition in language acquisition.

Methodology: This was a cross-sectional study with a mixed approach, involving qualitative and quantitative analyzes. A total of 105 participants were grouped into native Portuguese speakers with no knowledge of English (control group 1), native English speakers with no knowledge of Portuguese (control group 2), and native speakers of Portuguese who were either basic, intermediate or advanced in FL-English (experimental group). The main experiment was an oral video description task with 15 video clips showing five Paths (up, down, into, out of, across) in three Manners which (e.g. walking, running or rolling down a hill).

Results and Discussion: Bilinguals predominantly expressed motion in English as expected in that language, utilizing the satellite-framed lexicalization pattern more frequently than the verb-framed pattern. However, the results of the Mann-Whitney test showed that all subgroups of bilinguals used the satellite-framed pattern significantly less than the English-native control group, underscoring proficiency level as an important constraint in conceptual restructuring. Basic and intermediate participants used their L1 pattern more often than the advanced ones. Furthermore, a hybrid pattern emerged among bilinguals, which combined elements of both L1 and FL patterns, such as "The man went up the hill crawling." This pattern was not observed in the control groups, and it suggests that motion cognition in these participants is fundamentally bilingual.

Conclusions: This study provides evidence of conceptual transfer in the expression of motion by bilinguals. As proficiency in FL-English increases, bilinguals gradually restructure their conceptual representations in line with the target language. The emergence of a hybrid pattern is a product of cross-linguistic influence at the conceptual level. The present research reveals the intricate dynamics of conceptual transfer in bilingual language acquisition, offering valuable insights for educators and researchers in the field of Second Language Acquisition.

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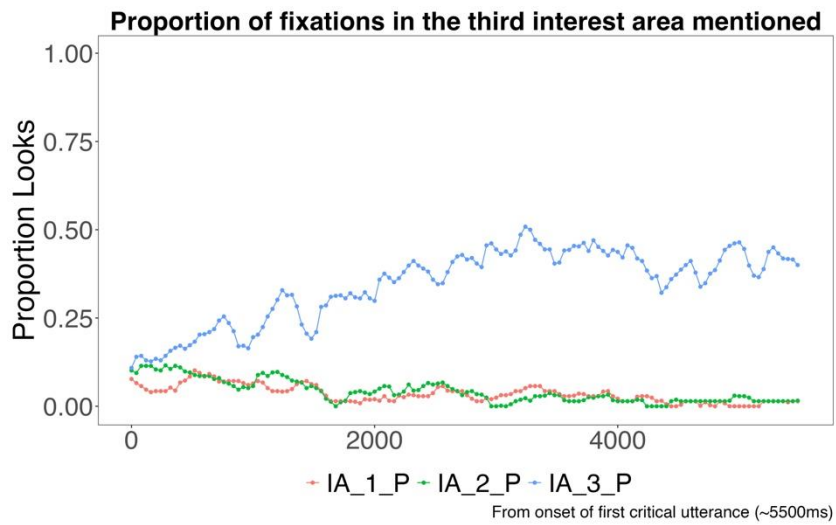
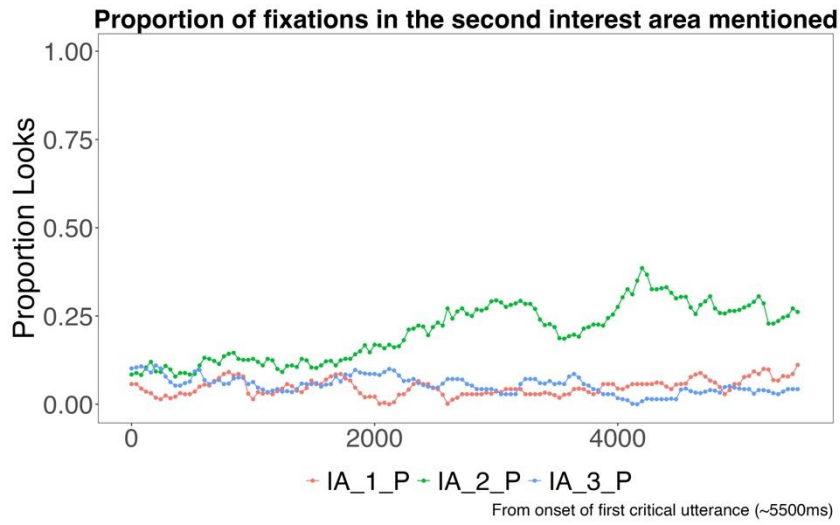
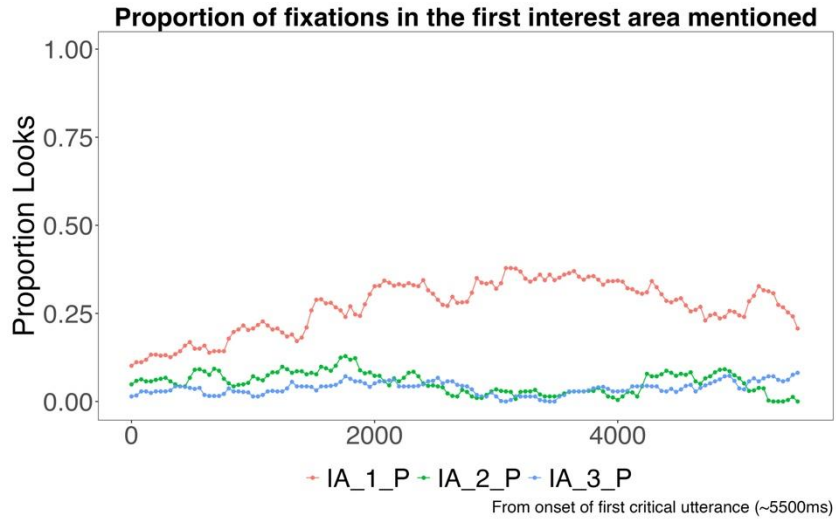
How words can guide your eyes: Increasing engagement with art through audio-guided visual search

Pursuing cognitively stimulating activities, such as engaging with art, is crucial to the maintenance of whole person health throughout the lifespan. The current work empirically tests the usefulness of audio-guided visual search to increase enjoyment and retention of information when viewing art pieces. To this end, we simulate visits to an art museum in a laboratory setting. More specifically, we developed audio guides that present information about the piece being viewed and encourage viewers to engage with the painting through guided visual search (e.g., “In this painting, the children are sitting around the table. The items in their hands and on the table suggest that it is dinner time”).

Thirteen older (over 65 years old) and 3 young (under 35 years old) adult participants viewed 10 paintings on a computer screen while listening to an accompanying audio guide and having their eye movements recorded (SR Research Eyelink 1000). The audio guides participants heard referred to three specific areas of the painting they were viewing (IA_1, IA_2 and IA_3 in the figures below). The relevant areas of the painting were marked as regions of interest. As well, the time point when these items are mentioned in the audio description was cross-references with the eye movements recorded to assess whether participants look at the areas being described.

Our preliminary findings show that both younger and older adults increased fixations to an area of interest in the painting significantly while it was being described in the audio guide (i.e., higher proportion of fixations while the utterance unfolds), suggesting that participants’ attention is being guided by the auditory input (see figures below). In a subsequently administered questionnaire, both groups reported that the audio guide increased feelings of enjoyment and engagement in the task. In sum, the use of audio guides, specifically the gamification of linguistically guided visual attention, appear to increase meaningful engagement with art.

To further test the validity of this approach, we will analyze the link between participants implicit (i.e., eye movements) and explicit (i.e., self-report questionnaire) engagement with this task. Furthermore, we will increase our sample of young adult participants as well as add a free-viewing condition to establish a baseline of eye movement patterns and retention.



KNIVE-knives: Lexical Cloning and Inflection

September 2023

While reduplication and compounding are traditionally treated as two separate processes, the boundaries between them (and indeed the definitions of each) are far less clear than might be assumed. Exploring cases near this boundary promises to help reveal what each process fundamentally entails and how they interact. One such case is Lexical Cloning.

Lexical Cloning (LC) is a phenomenon in colloquial speech wherein an element is repeated with contrastive stress (marked with SMALL CAPITALS) to convey a prototypical reading. The phenomenon is wide-spread and flexible occurring with a range of different parts of speech as well as with other elements both above and below the word-level as shown in (1), (Ghomeshi et al., 2004).

- (1) a. I'll make the tuna-salad and you make the SALAD-salad.
- b. Do you LIKE-like him?
- c. Is he FRENCH-French?
- d. Oh, we're not LIVING TOGETHER-living together.
- e. They're not FAN-fans.

This phenomenon has received analyses as reduplication (Ghomeshi et al. (2004), Contrastive Focus Reduplication) and as compounding (Hohenhaus (2004), Identical-Constituent Compounding) and indeed displays hallmarks of each. However, one important feature of LC which has gone under-analysed is the role of inflection and object pronouns. These elements are sometimes copied across and sometimes are not - the rules governing when this occurs are as of yet unclear. Specifically, I have noticed an interesting feature of LC with "near-regular" plural such as *knives*; with such plurals it is possible to copy the (weakly) supplet root without the inflection giving forms such as KNIVE-knives.

To better examine this and other related phenomena, I have designed an experiment which looks to explore various scenarios with the goal of revealing the nature of the rules governing LC inflection.

The overall experiment consists of two types of trial, the first of which is a simple acceptability judgement; participants are presented with a sentence containing a LC form and asked to rate its acceptability. The second is slightly more complex; participants are presented with a sentence containing a gap and asked to select one of two LC forms to fill the gap. The two forms given consist of the same word with or without repeated inflection.

The experiment defines 5 main categories of prompt:

1. Items with a short inflectional suffix, e.g. FAN-fans/FANS-fans
2. Items with a longer inflectional suffix, e.g. CRASH-crashes/CRASHES-crashes
3. Items with suppletive inflection, e.g. MAN-men/MEN-men
4. Items with both a suffix and suppletive inflection (these items have 3 separate forms, two of which are selected for any given trial) e.g. KNIFE-knives/KNIVE-knives/KNIVES-knives
5. Items with an object pronoun, e.g. LIKE-like her/LIKE-HER-like-her

The results from this experiment should reveal both the overall acceptability of the various forms and individuals' preference between items. The full experiment is currently running but some of this can be seen in the results from the pilot (10 participants) which show, for example, that while the short and long suffixes (Fig. 1 & 2) are quite similar, the longer suffixes are somewhat more likely to be excluded than the shorter ones. We can also see that there is a very strong preference to include suppletion (Fig. 3). Finally, see that there is a strong split between participants in whether or not to include inflection in the near-regular case as well as uncertainty over whether to include the suppletion.

These findings provide fascinating insights as they are at odds with one another, some strongly point towards LC being reduplicative while others suggest that it is compounding-based. Properly exploring these findings promises to reveal much about both constructions.

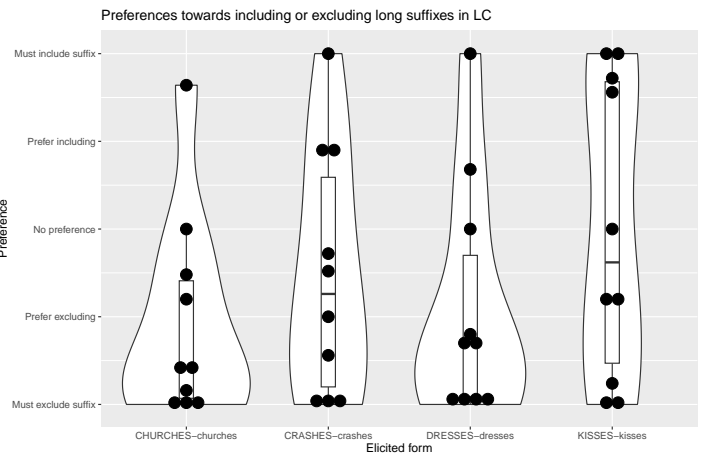
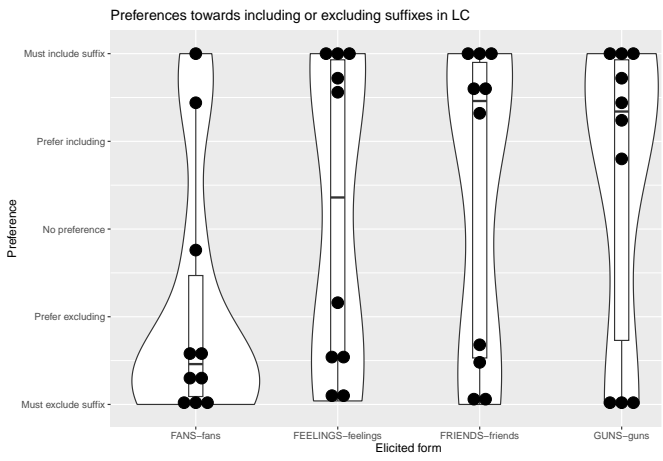


Figure 1: Short suffix prompts

Figure 2: Long suffix prompts

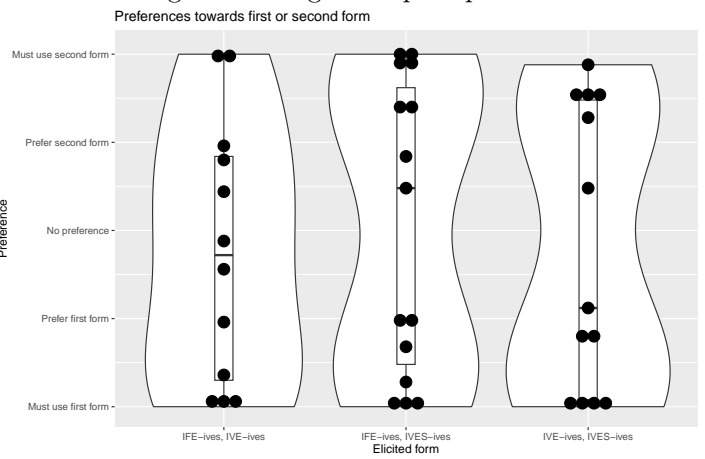
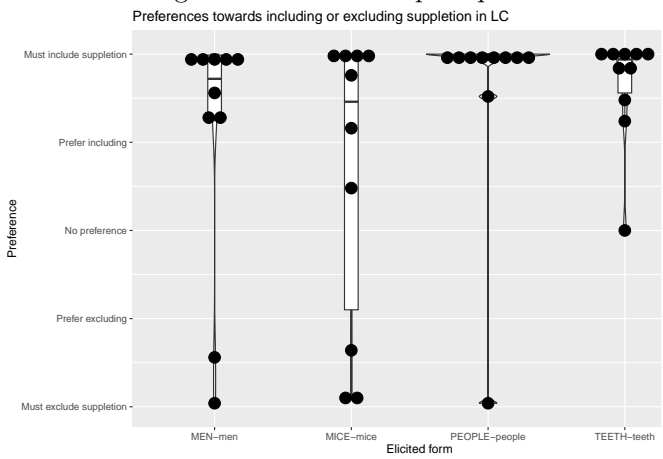


Figure 3: Suppletion prompts

Figure 4: Near-regular prompts

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L1 ≠ L2 = L3: Differential social normativity in first vs later-acquired languages

Recent research has shown that the same dilemma may elicit different moral judgements depending on the language in which it has been presented. The explanation usually invoked is the different purported emotionality of content presented in one's first vs second languages.

Using a covert 2×2×2 experiment where 61 L₁ Polish–L₂ English bilinguals were asked to translate (L₁↔L₂) a passage peppered with swearwords, we show that the picture is much more complex. While the results ostensibly corroborate the so-called 'foreign language effect', with a significant interaction between the source and target words and the direction of translation, it was only observed in the case of *ethnophaulisms*, that is expletives directed at social (out)groups (significant interaction between the source and target words, direction of translation, and type of word, $F(1,59)= 59$, $p<.01$; $\eta_p^2=.16$), but not *generic swearwords*. This indicates that the key factor modulating response strength is not so much the different emotional power associated with the respective languages, but *social and cultural norms*.

In a follow-up study, we extend the investigation of the effect of language choice on acceptability judgments of social norm violations by looking at whether a difference will be observed in ratings given in multilingual speakers' L₃ vs L₂. Expectedly, the acceptance rates of scenarios presented in the two languages did not differ much. However, regression analyses indicated different predictors of evaluations: in the L₂, the age factor was significant, with older participants more severe in their judgments; the severity of judgments passed in the L₃ in turn depended on the respondent's gender, with male participants evaluating the scenarios as less severe.

It transpires that switching to a foreign language during decision-making may not only reduce emotionally-driven responses and political correctness biases, but also promote candid deliberative processes, with other factors moderating the process.

The effect of idiomatic co-occurrence on lexical networks

Idioms, such as “to bury the hatchet” (meaning *to end a conflict*) form an important part of the native speaker’s phrasal vocabulary, which is frequently used in everyday communication (Pawley & Syder, 1983). One of the key questions in psycholinguistic research on idioms concerns how this knowledge is represented and accessed by the language user. Hybrid theories of idiom representation and processing (e.g., Cacciari & Tabossi, 1988; Titone & Connine, 1999; Sprenger et al., 2006) assume that idioms are represented both in terms of their lexical elements and in terms of an overarching idiom representation that serves to connect these elements with the phrasal meaning (e.g., a *superlemma*). These theories therefore predict that lexical co-occurrence within a fixed expression has a lasting effect on the structure of the mental lexicon: words that neither share aspects of their meaning nor of their form will be “wired together”, because they are processed as part of the same fixed linguistic structure.

In line with this hypothesis, facilitatory effects of idioms in their phrasal context have consistently been observed in language comprehension research (see Conklin & Schmitt, 2012, for a review). Taken together, these experiments support hybrid models of idiom representation and processing, suggesting tight links between the words of an idiom that are mediated by a common idiom representation. Here, we want to take this research a step further by studying the processing of lexical elements of idioms in isolation. More specifically, we ask if the long-term storage of idiomatic expressions affects the organization of single lexical items in the mental lexicon. If idiom representations indeed tie their lexical elements together, enabling spreading activation from one element to another, facilitatory effects should not depend on idiom recognition in a phrasal context, but should independently occur for lexical elements. In other words, *bury* should prime *hatchet*, even if presented in isolation.

To this aim, we study the representation and processing of idiom words *without phrasal context*. Using visual word priming, spreading activation for idiomatically related word pairs (e.g., *bury - hatchet*) was compared to semantically related (e.g., *answer - question*) and unrelated word pairs (e.g., *trim - question*) in two experiments varying in SOA (500 ms and 350 ms). In line with hybrid theories of idiom representation and processing (e.g., Sprenger et al., 2006), facilitatory priming was found in both experiments for idiomatic primes, suggesting a tight link between the words of an idiom that are mediated by a common idiom representation. While idiomatic priming was stable across SOAs, semantic priming was stronger for the short SOA, implying fast and early activation. In conclusion, one lexical element of an idiom can facilitate the processing of another, even if the elements are not presented within a phrasal context (i.e., within an idiom), and without the words being semantically related. We discuss our findings in the light of theories about idiom processing, as well current findings in the field of semantic priming.

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Leveraging Social Network Data to Ground Multilingual Background Measures: Validating Entropy Part 1

Individual people use language in highly diverse ways. Multilingualism research suggests that language diversity is central for regulating how languages are represented, accessed, and controlled, over and above measures such as L2 age of language acquisition, and self-reported ability (e.g., Gullifer & Titone, 2020; Tiv et al., 2021; Titone & Tiv, 2022). Inspired by information theory, language entropy (Gullifer & Titone, 2018; 2019) is a way to characterize how bilinguals use their languages in daily life. This measure indexes balance, or diversity, in the use of two or more languages and can be computed from questionnaire data (e.g., Li, Zhang, Yu, & Zhao, 2019). Language entropy can track compartmentalized versus integrated language use in both general (i.e., using global language usage proportions) and socially based manners (i.e., by averaging language use across different social spheres). However, a gap in this literature is how language entropy (derived from basic questionnaires) related to more ecologically valid measures that quantify socially realistic language use, such as people's unique social networks.

Thus, we use social network data, which has high ecological validity but is lengthy to ascertain, to ground questionnaire-based language entropy. In doing so, we specifically examined the links between questionnaire-based language entropy (both general and socially-specific), and social network entropy (both general and socially-specific) across 95 multilingual adults living in Montreal. We used detailed social network measures that had ego and ego-alter measures to calculate general social network entropy and specific social network entropy based on the information provided for each alter (i.e., specific people in each individual social network). Exploratory factor analysis can provide an initial answer to the question, exploring how the questionnaire-based language entropy and social network entropy loaded onto latent factors (see also Gullifer et al., 2021). The results showed that questionnaire-based language entropy and social network entropy grouped together for general and socially-specific manners to compute language use. These results are an external validation of entropy as a tool to explore language diversity. Moreover, in a complementary work, we validated entropy by exploring how different bilingual groups vary in their language usage and how the composition of their social network plays a role (see Yang et al., 2023).

The role of orthography and phonology during L1 vs. L2 typewritten production

Written picture naming is traditionally assumed to involve two different pathways from lexical to orthographic activation: a direct route from the lexicon to the orthographic layer, and an indirect route, that passes activation from the lexicon to the orthographic layer via the phonological layer (Bonin et al., 2015). The individual contribution of both routes may depend on factors such as the modality of language acquisition. Indeed, whereas the first language (L1) is typically acquired in spoken modality and only later in written modality, the second language (L2) is often acquired simultaneously in both modalities at school. Here, we investigate whether L2 speakers rely more on the direct route during written production compared to L1 speakers in a web-based study. We recruited 108 English-French bilinguals, who learned their L2 for the first time at school, of which half had English as their L1 and the other half had French as their L1. They performed a typewritten picture-word interference task once in their L1 and once in their L2. We compared onset typing latencies in picture naming for pictures accompanied by visual distractors that were only phonologically (P) related, both phonologically and orthographically (PO) related, or unrelated to the target name. For instance, if the target was BOOT, the PO distractor was ROOT, the P distractor was LUTE, and the unrelated distractor was HATE. Importantly, P distractors had the same amount of orthographic overlap with the target as unrelated ones. Participants first went to a familiarization phase, where the target pictures (15 per language) were shown with their expected names, and after that, they typed the names of the pictures in a within-subject design (so each target picture appeared three times for each participant). We also included filler pictures (15 per language) that always appeared with unrelated distractors to mask the goal of the study. If the contribution of the direct route were more important in L2 than in L1, we predicted more facilitation in the PO vs. P condition in the L2 than in the L1. We analyzed the onset latencies of the target words using linear mixed effects models in R. In general, participants showed significant facilitation in the PO condition (PO vs. P: $\chi^2(1) = 18.49$, $p < .001$; PO vs. unrelated: $\chi^2(1) = 25.11$, $p < .001$), but not in the P condition (P vs. unrelated: $\chi^2(1) = 1.06$, $p = .30$), suggesting that overlap in orthography (together with phonology) was beneficial for retrieving the target spelling, whereas overlap in phonology alone was not sufficient for facilitation. Crucially, the magnitude of this effect was not different in the L1 compared to the L2, nor was there any language-specific effect. These results do not support the idea that L2 speakers would rely more on the direct route than L1 speakers, in contrast to our predictions. However, the finding that phonological overlap alone does not facilitate written naming challenges the idea that language users activate sounds during reading and writing. As such, the contribution of the indirect route – and thus phonology – to writing may be less important than is traditionally assumed (e.g., Zhang & Damian, 2010).

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TITLE: Context modulates word integration strategies in ambiguous idioms

Idioms are multiword expressions with a conventional figurative meaning that differs from the literal meaning of its individual words. Idioms' meaning call for a faster retrieval mechanism than literal meaning because they are processed as templates (i.e., "bite the dust") (1,2) rather than through composition. Ambiguous idioms (i.e., "break the ice") allow researchers to analyze both compositional and retrieval comprehension strategies using the same word strings.

We examined the use of these strategies in the processing of critical words (e.g. "ice" in "break the ice") within 88 ambiguous, familiar, opaque, 3-word idioms during sentence reading in Spanish. The idioms were embedded in highly constraining contexts (matched in cloze probability, naturalness and comprehension levels) designed to bias the readers towards either its figurative or its literal interpretation. For each condition, critical words could be replaced either by incongruent control words matched in length and frequency (i.e., "hat" in "break the hat"), or by a pseudoword. Sentences were displayed using RSVP, and participants performed a lexical decision task on the critical item (see 3). We expected faster RTs for the congruent than the incongruent condition as a result of context facilitation. Besides, as words in the figurative condition benefit from template retrieval, stronger predictions might lead to larger congruency effects.

As predicted, effects of Congruency, as well as the interaction between Congruency and Idiomacy were obtained, with larger congruency effects for the figurative than the literal condition. Our findings demonstrate that the prediction mechanisms for words in ambiguous idioms changes as a function of the preceding context (4). While figurative interpretations operate as a rigid template matching, literal interpretations allows for a more flexible integration mechanism.

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Title : Semantic Intercorrelation Facilitate the Effect of Semantic Richness on Language Production

Abstract

Conceptual preparation is the very initial step in language production. Accurate and efficient conceptual activation and selection could facilitate lexical selection, which improves the efficiency of word retrieval. Yet, few studies have investigated how the semantic features of concepts affect word retrieval cooperatively.

From the perspective of Node Structure theory (MacKay, 1987), priming from many semantic nodes converging onto a single lexical node could summate across these connections, and the intercorrelation density among these features could further strengthen the connection. Therefore, the present study aimed to explore how the richness of semantic features and the density of their interrelation contribute together to word retrieval, using behavioral and fMRI techniques. Participants were asked to perform a picture naming task in the scanner. To manipulate semantic richness and intercorrelation feature density, concepts that varied in the number of features (NOF) and intercorrelation feature density (ICFD) were selected based on the McRae conceptual dataset (McRae et al., 2005). A 2 (NOF, high vs. low) \times 2 (ICFD, high vs. low) design was formed. Forty healthy participants were originally recruited, and data from 34 participants have been analyzed using two-way ANOVA.

Results showed that semantic richness facilitated the retrieval of corresponding words such that concepts with more features could be retrieved much more easily. What's more, though there is no main effect of ICFD on word retrieval, ICFD could modulate the effect of semantic richness. Under high ICFD conditions, words with higher NOF could be retrieved much faster, while there was no effect of NOF on word retrieval for lower ICFD conditions. These preliminary findings support the concepts of Summation of Priming that more converging semantic nodes and more intercorrelation among these semantic nodes could strengthen the connection to the target concept and further facilitate word retrieval.

Deciphering the Intricacies of (Misspelled) Logotype Identification via Event-Related Potentials

For common words, letter position encoding can exhibit some degree of flexibility (e.g., CHOLocate is often confused with CHOCOLATE; see Dehaene et al., 2005, and Grainger & Whitney, 2004, for models of letter position encoding), although this flexibility is eventually resolved. The electrophysiological signature (via event-related potentials, ERPs) of the transposed-letter (TL) effect shows that TL pseudowords (CHOLocate) and correctly spelled words produce similar ERPs between 360-470 ms post-stimuli. Critically, from 470ms on, both TL pseudowords and replacement-letter (RL) pseudowords (e.g., CHOTONATE) elicit larger negativities than words (Vergara-Martínez et al., 2013).

Logotypes, unlike common words, are unique stimuli in terms of font, color, and letter case, ensuring consistent features that aid in logotype recognition. But how is letter position encoded during logotype recognition? Recent behavioral experiments have shown that misspelled logotypes (e.g., SASMUNG) are often perceived as the original logotype, especially when embedded with their graphical information (Perea et al., 2021). Thus, letter position coding in logotypes appears to be even less constrained than in common words, probably due to the dominance of graphical information in logotype identity. To further examine this issue, we recorded ERPs while participants conducted a semantic categorization task in which they decided whether a logotype was a means of transportation or not (Figure 1). RL logotypes elicited larger amplitudes than TL and correct logotypes in all processing stages—there were no differences in amplitude between the TL and the correctly spelled brand names along the various time windows (from 150 ms to 600 ms; Figure 2). Thus, letter position encoding in logotypes is exceptionally flexible. We discuss how these findings can be used to refine more comprehensive models of visual word recognition.

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Figures

135 CRITICAL STIMULI			99 OTHER STIMULI	
Original	Transposed letters	Replaced letters	Original (54 go-responses)	Embedded in transportation brand
				

Figure 1. Example stimuli of the ERP experiment. The critical comparisons were between the original, transposed-letter and replacement-letter brand names (no-go responses, i.e., non-travel logos). Ninety-nine other stimuli were added to fulfill the task requirements – a semantic categorization task in which participants had to decide whether the brand name’s logotype was related to travel or not.

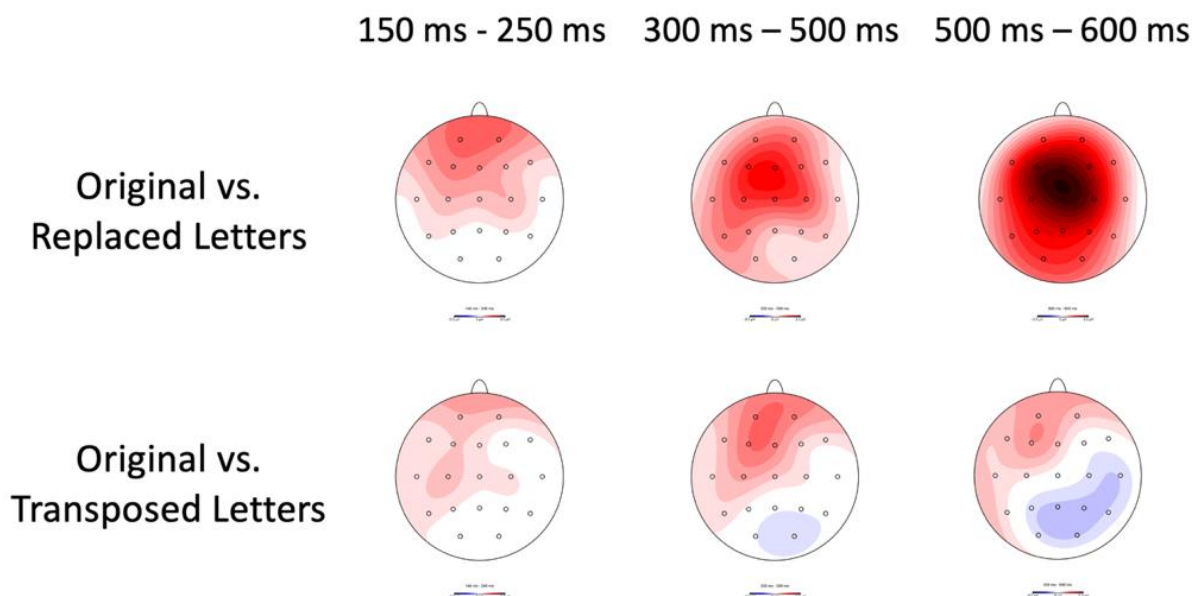


Figure 2. Scalp maps displaying the topographic distribution of the transposed-letter effects, calculated as the difference in voltage amplitude between the ERP responses to original- vs. replaced-letter logotypes (upper row) and to original- vs. transposed-letter logotypes (lower row) in the three time-windows of the analysis.

‘Die laughing’ as a Discourse Marker of Sarcasm: Its Uses in Social Media Corpus During the Covid-19 Pandemic in Taiwan

In this paper we examine the use of *xiaosi* ‘laugh-die’ or ‘die laughing’ not as a verb but as discourse marker of sarcasm. The term was originally used to exaggerate a humorous point – thus, ‘laugh-die’ (resultative verb). A typical example would be in (a) when it is used as verb. Yet, in online communication, the verb has lost its verbal meaning and to adopt a discourse function that is often related to sarcasm (Burgers & van mulken, 2017). Discourse markers are used to manage conversational turns and mark stances between speaker and hearer (Schiffrin, 1987; Fraser, 1999; Schourup, 1999).

Instances of *xiaosi* ‘laugh-die; die laughing’ on Facebook posts were retrieved through CrowdTangle by investigating the number of *xiaosi* used during the Taiwan level-3 (5/15/2021~7/26/2021) alert of the COVID-19 pandemic. A total of 5,320 posts were found. From these posts, those that have a comma that follows have 385 instances. After analyzing these 385 instances, we found two types of *xiaosi*:

(a) The literal meaning ‘die laughing’ (28.2%)

E.g., [theme+ (adverb) *xiaosi* + (clause) + an open-ended question]

從東南亞旅遊回來的朋友一說到水果就停不下來。快要[笑死]，我就是那個朋友，你們身邊有朋友都是這樣嗎？

‘People who have returned from traveling in Southeast Asia can’t stop talking about fruits. I’m dying laughing. I’m one. Do you have friends like this?’

(b) A discourse marker function (71.8%)

E.g., [theme+ *xiaosi* + (clause) + a rhetorical question]

口試委員使用視訊遠端口試。[笑死]，口試委員視訊、學生群聚面試？

‘The oral examination committee used an online conference for oral examination. Laughing dead, oral interview committee used video conference, students sat in group to attend the interview?’

The use of sarcasm usually starts with a theme (i.e., the issue to comment on), followed by a stance (*xiaosi*), followed further by the speaker’s opinion on the issue (usually in question forms). This new function of *xiaosi* has become more famous in recent years even during the serious 3-level alert of the pandemic in Taiwan. The interaction between lexis and its grammatical function (as verb and as discourse marker) is worth discussing.

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The role of sublexical and lexical skills in children learning to read in a transparent orthography.

Implications for reading instruction

Sublexical skills such as letter knowledge facilitate applying sublexical letter-sound mappings to decode words, and therefore ensure accurate reading during the first years of reading instruction (Caravolas et al., 2012; de la Calle et al., 2018). With reading experience, lexical skills such as word identification replace letter-sound mappings as an effective strategy for decoding and spelling, particularly in opaque orthographies with inconsistent mappings between letters and sounds (Rothe et al., 2015; Mesquita et al., 2020). In transparent orthographies however, letter knowledge seems to be an enduring predictor of decoding and spelling, even in children with some reading experience (Torppa et al., 2016).

Recent empirical evidence sustains that word learning is easier in transparent than in opaque orthographies: children need very few exposures to correctly identify words (Suárez-Coalla et al., 2016). These findings suggest that after some reading experience, children's word identification skills might support word decoding and spelling even in transparent orthographies. This study investigates the impact of children's sublexical –knowledge of letter sounds- and lexical skills -word identification and vocabulary- in word decoding and spelling accuracy in a very transparent orthography. The sample consisted of 117 Spanish speaking children with certain reading experience -aged 8 to 10-.

Path analysis models showed that: (1) Letter knowledge and Word identification were independently associated with children's word spelling; (2) Word identification was uniquely associated with word decoding; (3) children's vocabulary level was associated with word identification. Results reveal that children in transparent orthographies rely on their lexical and semantic knowledge for both decoding and spelling. Letter knowledge is employed as a residual strategy for word spelling. The implications of these findings are discussed within the framework of reading models and the characteristics of a transparent orthography.

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Thermal and Metaphorical Meanings: Analysing Temperature Adjectives in European Portuguese

Temperature, a crucial metric of thermal conditions, profoundly impacts human life, spanning health, agriculture, energy utilization, climate, and research. Furthermore, temperature adjectives play a distinct and multifaceted role, serving as linguistic vehicles to convey both the sensory perception of physical temperature and metaphorical extensions that resonate across various spheres of communication.

Languages may exhibit significant diversity in the number of temperature terms, their categorization, and word class allocation (e.g. Plank 2003, Koptjevskaja-Tamm & Rakhilina 2006, Koptjevskaya-Tamm 2015.). Furthermore, in various languages, common points emerge in the semantic representation of temperature adjectives, that may convey temperature information and other types of information, through metaphorical extension (e.g. Juvonen & Nikunlassi 2015, Perkova 2015, Rasulić 2015).

In European Portuguese (EP), linguistic research on terms related to temperature, namely temperature adjectives, is quite limited, and it has received little attention, except for a separate subclass in the classification of descriptive adjectives in EP (Veloso & Raposo 2013) and some metaphorical uses. With the aim of better understanding temperature adjectives in EP, we selected a set of eight temperature adjectives (*gélido, gelado, frio, fresco, morno, tépido, quente, escaldante / Icy, cold, chilly, cool, lukewarm, tepid, hot, scorching*) and their non-metaphorical and metaphorical readings from a corpus comprising 2925 selected fragments extracted from the CRPC Corpus (Corpus of Reference of Contemporary Portuguese) (Mendes et al. 2012). The general objectives are to describe the overall syntactic and semantic features of these adjectives in EP and analyse their polysemous patterns.

We opted for a mixed methodology, both quantitative and qualitative. For the quantitative analysis, we considered the number of occurrences and contextual frequency. The qualitative analysis aimed at the description of these adjectives' syntactic and semantic features, as well as their functions and uses in two different contexts. The data classification was validated by two linguist experts.

The results showed that all adjectives have metaphorical readings beyond the basic temperature reading. However, based on the data, it is observed that not all of them distribute themselves in the same way regarding the two possibilities. Furthermore, these adjectives can occur in both attributive and predicative positions, although the attributive position proves to be dominant in all of them, and in this position, they mainly occur post-nominally. Besides, although these adjectives are descriptive and, therefore, admit degrees, not all of them respond in the same way to the possibility of co-occurrence with degree quantifiers. The alternation between the temperature reading and the metaphorical reading largely depends on the context and not just the nouns with which the adjective combines, as there are nouns that can occur with certain adjectives either with a temperature reading or a metaphorical reading. Both in temperature readings and in the metaphorical ones, it is observed that, according to the nouns with which each adjective combines, it was possible to organize a set of parameters associated with temperature and metaphorical uses. This also allowed us to establish relationships between groups of adjectives located at different points on the temperature scale, using conceptual metaphors (e.g., Lakoff & Johnson 1980; Kövecses 2005).

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AN ONTOLOGY OF DEMOCRACY: A COGNITIVE LINGUISTIC ANALYSIS

In this talk, I explore the structural organization of the concept of DEMOCRACY from the perspective of cognitive linguistics. I hypothesize that the ontology of DEMOCRACY is a structured unity of interrelated concepts profiled within five domains PEOPLE, ELECTIONS, POWERS, GOVERNMENT and INTERACTION, which belong to the political segment in the world construal.

Being of great social value, the concept of DEMOCRACY has been explored in many aspects. Particularly, considerable amount of modern research has concentrated on the issues of linguistic representations of democracy (framing theory), its metaphoric verbal images (the theory of metaphor) and last but not least its cross-cultural variations (distributional semantics). In this research, I suggest the ontological model of the concept of DEMOCRACY, elaborated on the basis of textual descriptions taken from political science databases.

To substantiate my hypothesis, I apply the basic premises of the knowledge organization theory [Dahlberg, 2006, pp. 85–91], and the methodology of linguocognitive analysis of political narratives [Zhabotynska & Velivchenko, 2019, pp. 368–69]. Ontology can be defined as a knowledge organization system, composed of the constellation of concepts arranged in a cohesive logical way, which serves for collection, management and retrieval of knowledge about the experienced reality. A key feature of ontology that makes it a more preferable and efficacious tool for concept representation as compared to other knowledge organization systems is the complex system of relations between their entities (concepts), which reflect tangled relations between entities in a real world [Mazzocchi, 2018, p. 62].

In this talk, I will claim that the ontology of DEMOCRACY is a complex phenomenon, a combination of four main domains, such as PEOPLE, ELECTIONS, POWERS, GOVERNMENT and the linking domain INTERACTION. Furthermore, these domains are segmented into smaller sub-domains, each of which reveals different aspects of democracy as a political doctrine. This ontology may serve as an informational framework for the analysis of linguistic realization of the concept DEMOCRACY in modern political media discourse.

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This paper investigates how native Hindi speakers syllabify word-initial and word-final clusters, examining the constraints within the syllable structure. These constraints, known as Morpheme Structure Conditions (MSC) in generative phonology, reflect native speakers' intuitive knowledge.

Hindi features [ccvc] and [cvcc] clusters that defy the sonority sequencing principle (SSP) proposed by Clements (1990). For instance, sibilant + voiceless stop clusters in the onset position violate the SSP, remaining extra-syllabic. To syllabify such clusters, vowel epenthesis techniques are used.

There's also a debate among Hindi phonologists about the presence of a schwa in word-final vocalic release. Some support the schwa concept, while others contest it.

This study combines experimental research with a discussion of mental grammar. Data were collected from five native speakers, and acoustic phonetic analysis showed systematic use of epenthetic vowels [a, i, u] in word-initial and word-final clusters, conforming to [vc.cvc] / [cvc.cv] syllable patterns.

The study finds that native speakers syllabify clusters by vowel epenthesis or word-final vocalic release. Vocalic release durations vary based on phonotactic environment. Epenthetic vowel durations are also measured.

The mean duration of the vocalic release after the voiceless, un-aspirated word final segment was 43.18 milliseconds (ms), whereas after the voiced segment it was 85.68 ms. Release after the voiceless aspirated segment was found to be 96.75 ms, and the longest duration was after the voiced aspirated segment, 117.75 ms. The duration of epenthetic vowels [a, i, u] was 72.15 ms, 51 ms, and 63 ms, respectively.

In summary, this study validates the perceptual aspect of syllabification and highlights that syllabification is an element of mental grammar, naturally performed by native Hindi speakers.

Affix substitution in Indonesian: A study of functional load

The Indonesian language exhibits a paradigmatic relationship between nouns with prefixes *PEN-* and verbs with the prefixes *MEN-*. For example, the noun *penari* ‘dancer’ corresponds to the verb *menari* ‘to dance’; these two derivations have *tari* ‘dance’ as the base word. These two prefixes share a common set of allomorphs, thus they constitute a morphological regularity (Ermanto, 2016; Nomoto, 2017).

The main question in this study is how *PEN-* and *MEN-* form similarities affect language learning. We employed a computational model known as the ‘discriminative lexicon’ (DL) (Baayen et al., 2019). Our database consisted of 2,517 words (109 instances were nouns with *PE-* and 221 instances were nouns with *PEN-*). Comprehension accuracy for *PE-* was 98% and *PEN-* was 100%. Furthermore, we propose a measure of functional load to distinguish *PEN-* from *PE-* words.

The left panel of Figure 1 shows the functional load distributions of *PE-* (red) and *PEN-* (blue)’s first three triphones. The initial triphone is more significant for *PEN-*, while the second triphone is more significant for *PE-* ($W = 8,467$, $p < 0.0001$ and $W = 17,438$, $p < 0.0001$ for both comparisons). The right panel of Figure 1 shows that the model’s need to identify nouns beginning with *PEN-* from those beginning with *PE-* and verbs with *MEN-* makes the first triphone #PE (# denotes the word boundary) of *PEN-* important. In addition, the model uses the second triphone more for *PE-*, peX (X denotes the first sound of the base word), to discriminate between words with *PE-* and words with the other prefixes.

From a discriminative perspective, n-phones at the juncture of prefix and stem are precisely those cues that potentially have a high functional load. This measure helps clarify the relative importance of the triphones in the prefixes and those straddling the boundary between the prefix and stem (Hay, 2003).

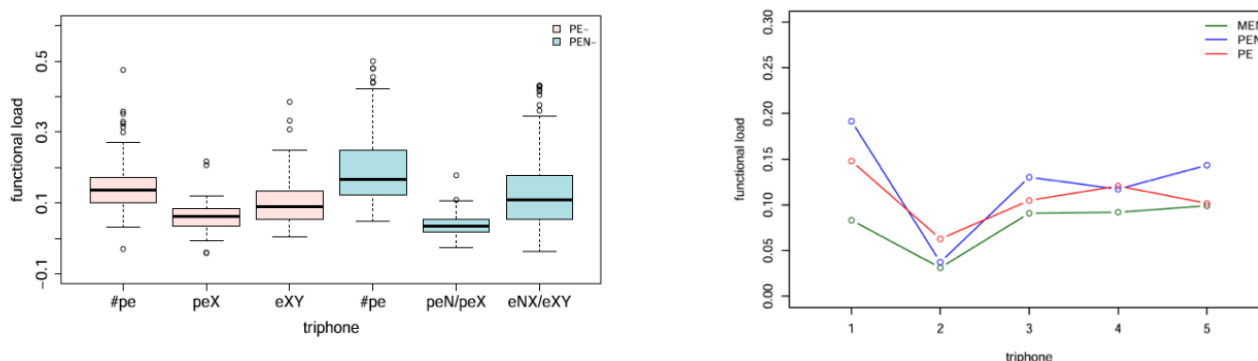


Figure 1. Left panel: functional load for the first three triphones of words with *PE-* (red) and *PEN-* (blue). Right panel: mean functional load of the triphones at positions 1 to 5 for *MEN-*, *PEN-*, and *PE-*. The low functional load for the second position, which comprises all the triphones of the prefix itself, is noteworthy.

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Poster Session 2 – Friday Afternoon

01. Does word rotation influence access to a word meaning?	Hussein Mehmet (University of Essex); Teresa Civera (Universitat de Valencia); Eva E. Gutierrez-Sigut (University Of Essex)*; Marta Vergara (Universitat de Valencia)
02. NLP and Education: using semantic similarity to evaluate filled gaps in a large scale cloze test in classroom	Raquel M K Freitag (Universidade Federal de Sergipe)*; Julian Tejada (Universidade Federal de Sergipe); Túlio S Gois (Federal University of Sergipe); Flávia Freitas (Universidade Federal de Sergipe)
03. Are transposed-letter effects due to perceptual noise?	Inka Romero-Ortells Labrada (Universidad Antonio de Nebrija)*; Ana Marcet Herranz (Universitat de València); Pablo Gómez (Skidmore College); Manuel Perea Lara (Universitat de València)
04. How does a Person's L1 Writing Script Impact L2 Reading in a Same or Different Script?	Naima Mansuri (McGill University)*; Antonio Iniesta (McGill University); Esteban Hernandez-Rivera (McGill University); Pauline Palma (McGill University); Debra Titone (McGill University)
05. Pre-lexical morphological parsing of ambiguous roots in context: Evidence from a cross-modal task	Cedric Le Bouar (Concordia University); Roberto G de Almeida (Concordia University)*
06. Gradual emergence over multiple trials suggests the mismatch negativity (MMN) as an index of learned expectations	Jessie Nixon (University of Tübingen)*; Jacolien van Rij (University of Groningen)
07. A study on the processing of verbal inflection of tense and agreement in native Spanish speakers with aphasia.	Camila Stecher (UBA, CONICET)*; Virginia Jaichenco (UBA); María Elina Sánchez (UBA, CONICET)
08. Cultural Immersion and Pragmatic Proficiency: A Study of Language Acquisition in Spain	Constanza Uribe Banda (Wilfrid Laurier University)*
09. Polish and Ukrainian Nouns in the Light of a Distributive Analysis	Paula Orzechowska (Adam Mickiewicz University)*; Inna Stupak (University of Tübingen); Harald Baayen (University of Tübingen)
10. Examining the Impact of First Names in Everyday Interactions	Carolyn Tran (University of Windsor)*
11. Statistical Learning of a Tonal Language in Multilinguals, Bilinguals and Monolinguals	Yasmine Tachakourt (Mohammed V University in Rabat)*
12. Moving Towards an Understanding of the Role of	Princess O Eze (University of Alberta)*

the Inferior Fronto-Occipital Fasciculus in Language Processing	
13. The role of LexiaCore5 Reading in a bilingual context: developing phonological awareness skills in English (L2)	Marion Costa Cruz (UFRGS)*; Ubiratã Kickhöfel Alves (UFRGS)
14. How does income inequity and culture influence oral language and literacy practices in the Black communities of Montreal?	Tanya Matthews (McGill University)*
15. A Cognitive linguistics Study of the Feminine Meanings Embedded in the Construction of Chinese words with the Radical “女” with Dichotomies	Pu Meng (George Mason University)*
16. Do semantic primes influence the motor execution of keystrokes during the typing of words?	Ajay Mangat (Concordia University of Edmonton); Carolina Mendes (Concordia University of Edmonton); Rusna Panesar (Concordia University of Edmonton); Alex Taikh (Concordia University of Edmonton)*
17. Lexical decision and eye-tracker behavior in Brazilian Portuguese blend processing	Gustavo Estivalet (Universidade Federal da Paraíba)*; José Ferrari Neto (Universidade Federal da Paraíba); Rafael Minussi (Universidade Federal de São Paulo); Alina Villalva (Universidade de Lisboa)

Title: Does word rotation influence access to a word meaning?

Embodied cognition theories propose that conceptual information is grounded in sensorimotor brain regions (1,2) and lexical semantic processing might be rooted in sensorimotor experience. If static perceptual cues like word rotation influence the sensorimotor system, this may affect semantic processing of upward or downward concepts. We conducted a series of lexical decision experiments using movement verbs which conveyed either upwards or downwards meaning (e.g. *arise* and *decrease* respectively) rotated -45° or $+45^{\circ}$. We also manipulated task difficulty in subsequent experiments by varying the verb presentation time (2000ms, 250ms and 150ms) and visibility (clear or partially degraded fonts)(3).

In a first experiment in Spanish, Linear Mixed Models (LMMs) analysis revealed an interaction between meaning and word rotation, with faster response times for UP than DOWN orientations for words with an upward meaning but no differences for words with downwards meanings. However, upward meaning words were also more frequent.

In experiments 2-4 in English, we used the database in (4) to control for frequency and added a neutral condition. In Experiments 2 and 3 we used clear stimuli with 250 ms and 150ms-presentation respectively. In Experiments 4 and 5, we used partially degraded fonts with 250 ms and 150ms-presentation respectively. Across Experiments 2-5 consistently, LMMs only revealed that UP-oriented verbs were recognized faster than DOWN-oriented verbs, regardless of meaning direction.

Altogether, our findings do not support that static-arbitrary perceptual cues (i.e. orientation) interact with meaning during visual word recognition. Instead, the finding that upwards orientation facilitated lexical access reveals an early perceptual effect. The disruption of configural word integrity would be larger for clockwise word rotation (downwards orientation) than for counterclockwise rotation (upward orientation) (5).

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NLP and Education: using semantic similarity to evaluate filled gaps in a large scale cloze test in classroom

The cloze test has been widely used for 70 years to assess proficiency in understanding texts in different languages, both L1 and L2. The basis of the test is the systematic filling in of gaps in a text, and the scores of the correct answers are associated with the degree of comprehension of the text by the participant. Different measures have been used to assess gap-filling since Taylor's initial proposal (1953), such as exact answer, acceptable answer, multiple choice, and clozetopia [2,3].

In order to use the cloze test on a large scale to evaluate reading proficiency, an automatic and more accurate evaluation of responses is needed, and to do this, we would like to propose semantic similarity measures using Natural Language Processing (NLP) techniques. In this paper, we try to expand the measure by calculating the semantic similarity of the item in relation to the answer. In NLP, one of the most efficient ways of representing words is through word embeddings (WE), numerical vectors that represent a word in an n-dimensional space [4]. WEs can be generated via various algorithms and evaluated using tasks such as POS tagging and semantic and syntactic similarity. Hartmann et al. [5] evaluated 31 different WE models trained on a large Portuguese corpus (including both Brazilian and Portuguese variants), and the ones with the best evaluation in terms of semantic similarity for Brazilian Portuguese (BP) were: i. GloVe: 600 dimensions (semantic analogies); ii. Wang2Vec: 1000 dimensions (semantic similarity task). Another model widely used in BP is *pt_core_news_lg* [6], a Portuguese pipeline for SpaCy with 300-dimensional word vectors. To make a good selection of the WE model to evaluate cloze test responses, we propose an experimental study in which we will evaluate the responses to a cloze test using the best models available for BP and compare these results with the results of a group of judges who will also classify the words.

Twenty-four children from an elementary school performed a 37-gap Cloze test, and their answers were transcribed and tabulated. From this table, the gaps with more than 10 alternatives were selected for our initial analysis, leaving 19 of the 37 gaps with about 159 words. Twelve specialized judges ranked each one of the children's responses according to the phrase in which each gap was found. From the obtained ranking for each gap, the first-position words were removed, leaving the remaining 154 words. The internal consistency of the ranking defined by each observer showed a slight agreement (approximately 0.3).

In parallel, the semantic similarity of those 159 words was evaluated by cosine similarity, one of the earliest and most widely used distributional measures [7], using the WE models GloVe, Wang2Vec [5], and spaCy [8], obtaining a similarity ratio between the expected answer and each one of the transcribed words. These ratios were ordered descending for each one of the gaps, and the obtained rankings for each word were compared with the rankings reported by humans. An Analysis of Variance of Aligned Rank Transformed Data (ARTool R package, [9]) showed no significant differences between the human and the WE model ranks ($F(3,717) = 0.3486$, $p = 0.79$). The nonparametric spearman correlations showed significant high correlations between the different ranks, with GloVe as the best WE model. GloVe showed the highest correlation when comparing the ranking classification of all words (Fig. 1) and also when comparing the words separated into seven groups according to their linguistic functions (Fig. 2).

These results suggest that the existing word embedding models for Brazilian Portuguese are effective in evaluating responses to the Cloze test, and the semantic similarity measures estimated by these models align coherently with human responses to the same task. These findings suggest that NLP-based semantic similarity measures can be used to develop automatic cloze test evaluation systems that are both accurate and objective.

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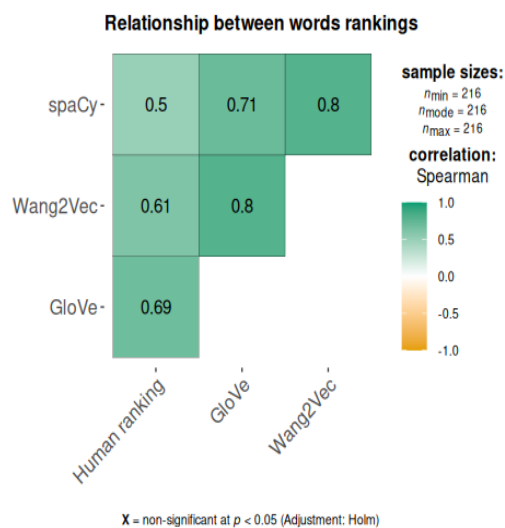


Figure 1. Spearman correlation between the different ranks

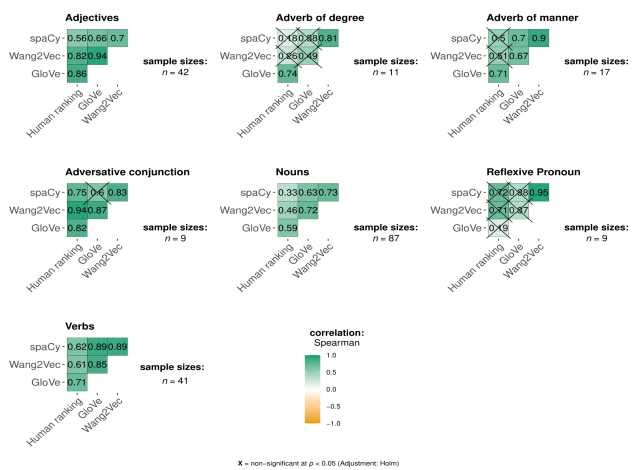


Figure 2. Spearman correlation between the different ranks classifying the words according to their linguistic functions.

Are transposed-letter effects due to perceptual noise?

Jumbled words like CHOLocate are often confused with their base words. One explanation for this effect relates to the ideas of perceptual noise during the assignment of letter positions (e.g., overlap model, Gomez et al., 2008): the letter D in JUGDE may also activate its neighboring positions. In the present lexical decision experiment, using non-canonical forms of presentation of words, we created transposed-letter pseudowords by transposing the initial consonant of consonant-vowel syllables (e.g., CHOLocate) and replacement-letter pseudowords (e.g., CHOTONATE). The transposed-letter effect was measured as the difference between these two types of pseudowords' response times (or error rates). The stimuli were presented syllable by syllable, completely vertical, or in zig-zag (Fig. 1-3). The logic was that the transposed letters would be more salient with the vertical alignment, being the initial of a line. Thus, these letters would be subject to less positional noise. The rationale behind the zig-zag format is that not only would the initial letters from the consonant-vowel syllables be more salient, but the letter transpositions would be farther, reducing the perceptual noise (Gomez et al., 2008).

Results showed a similar pattern for both vertical formats. The transposed-letter effect was 25 ms in the response times and 13% in the error rates, thus revealing that CHOLocate was still highly wordlike. These findings offer evidence against a perceptual explanation of the transposed-letter effect. Had perceptual noise been a critical component, the transposed-letter effect would have been quite small for the vertical format and reduced further for the zig-zag format. Therefore, the locus of the transposed-letter effect may be better placed at the interplay between perception and memory (i.e., in the assignment of the abstract letter units to their positions).

Figures:

CHO	CHO	<i>Figure 2. Word CHOCOLATE separated in syllables and each syllable per line in vertical format and in vertical zig-zag format.</i>
CO	CO	
LA	LA	
TE	TE	

CHO	CHO	<i>Figure 1. Pseudoword CHOLocate separated in syllables and each syllable per line in vertical format and in vertical zig-zag format.</i>
LO	LO	
CA	CA	
TE	TE	

CHO	CHO	<i>Figure 3 Pseudoword CHOTONATE separated in syllables and each syllable per line in vertical format and in vertical zig-zag format.</i>
TO	TO	
NA	NA	
TE	TE	

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How does a Person's L1 Writing Script Impact L2 Reading in a Same or Different Script?

Naima Mansuri, Antonio Iniesta, Esteban Hernández-Rivera, Pauline Palma & Debra Titone

Roughly half of the world's population speaks more than one language (Grosjean, 2010) and a large percentage of those people read in their second language (Lallier et al., 2021; Siegelman et al., 2023). Thus, an open question is whether and how people's multilingual knowledge impacts their second language reading processes. Here, we investigate whether competing influences from people's first language (L1) writing system or orthography (i.e., alphabetic, logographic or alphasyllabic) can impact reading comprehension and fluency when English (which has an alphabetic writing system) is a second language (L2). Based on models of L1 and L2 reading (e.g., Ziegler & Goswami, 2005), our general hypothesis is that matches or mismatches in people's L1 and L2 writing scripts will modulate the expected relationship between L2 English reading proficiency and how often people use their L2 in daily life (i.e., L2 usage). Using a subsample of 1073 healthy adult participants, from Siegelman et al. (2023), we found a main effect of L1 writing scripts for both L2 English reading proficiency and reaction time on L2 English reading proficiency tasks. Both L1 alphabetic speakers and L1 alphasyllabic speakers scored higher and had faster reaction times than L1 logographic speakers. Additionally, we found a significant interaction between L1 Writing Script and L2 English Reading Usage on reaction time on L2 reading proficiency tasks, as alphabetic and alphasyllabic writers both had faster reaction time with increased usage, but this effect did not hold true for the L1 logographic readers. These results suggest that orthographic features of an L1 can impact L2 reading. In doing so, these findings clarify how people's multilingual knowledge and experience mutually constrain each other in the context of L2 reading. They also suggest further avenues of theoretical and empirical advancement.

Pre-lexical morphological parsing of ambiguous roots in context:

Evidence from a cross-modal task

What is the nature of morphological parsing? While most models assume some form of morphological decomposition during the very early stage of word recognition (e.g., Taft & Forster, 1975; Libben, 1994; Libben & de Almeida, 2002; Rastle et al., 2004), other models assume that morphological analysis occurs after an initial full-word recognition process (Giraud & Grainger, 2001; see Beyersmann et al., 2012). In the present study, we relied on root semantic ambiguity to probe the nature of morphological parsing and lexical access. Several studies have shown that words that are ambiguous (e.g., *bark*, with meanings associated to either “dog” or “tree”) access both their meanings immediately after recognition, even when context selects only one of those meanings (e.g., Swinney, 1979; Onifer & Swinney, 1981; but see Tabossi, 1988; and Lucas, 1999). Roots like *bark*, however, when affixed by *-ing*, select only one of the possible meanings (“dog”). We embedded words like *barking* in sentence contexts biasing the full word meaning (e.g., *He heard loud barking during the night on Saturday*). We reasoned that, if *barking* is parsed early during recognition, we should find priming for both associates of the root.

Thus far, only two studies investigated whether the meanings of ambiguous roots within unambiguous words are accessed, using either visual masked priming (Libben & de Almeida, 2002) or eye-tracking and self-paced reading maze (de Almeida et al., 2023). These studies provided evidence that all meanings of the ambiguous root are accessed early in processing. In a cross-modal lexical decision task, we presented sentences aurally while subjects made a lexical decision to targets related to either meaning of the ambiguous root. We measured the activation of both root meanings at the *bark+ing* morpheme boundary and 500ms later. Visual targets, presented for 80ms, were forward and backward masked. Root meaning dominance was also controlled for (e.g., in *ringing* the dominant meaning of the root, associated with “finger”, is inconsistent with the affixed word). We predicted that both meanings would be primed at the early timepoint, but only the biased meaning would remain active at the late timepoint, if the prime is parsed before full recognition.

Participants' ($n = 38$) response times (RT) were entered into a generalized linear mixed model with timepoint, target type, priming, and dominance as fixed effects, participant and item as random effects, and block order as covariate. Results showed a significant main effect of priming ($\chi^2(1) = 12.05$, $p < .001$) and timepoint ($\chi^2(1) = 4.69$, $p = .030$) but no effect of prime type ($\chi^2(1) = 1.40$, $p = .237$) or dominance ($\chi^2(1) = 0.33$, $p = .568$). Planned comparisons reveal that related items elicited significantly faster RTs than control items ($z = 3.637$, $p < .001$) showing that the auditory primes successfully primed lexical decisions to related targets. No difference in RT was observed when comparing the two target types ($z = 1.214$, $p = .225$). Along the same lines, there was a significant effect of priming for both target types (root-only-related (*tree*): $z = 2.382$, $p = .017$; root+affix-related (*dog*): $z = 2.730$, $p = .006$) suggesting that exhaustive access to the meanings of the ambiguous root was observed. When breaking down priming over type and timepoint, priming was significant for the root meaning at the early timepoint ($z = 5.845$, $p < .001$) but no longer significant by the late timepoint ($z = -0.311$, $p = .756$). The root+affix meaning was significantly primed at both timepoints (early: $z = 2.565$, $p = .010$; late: $z = 2.550$, $p = .011$). These preliminary analyses partially replicate prior studies, cross-modally. We suggest that morphologically complex words are decomposed before semantic access, suggesting an early parsing system blind to semantics.

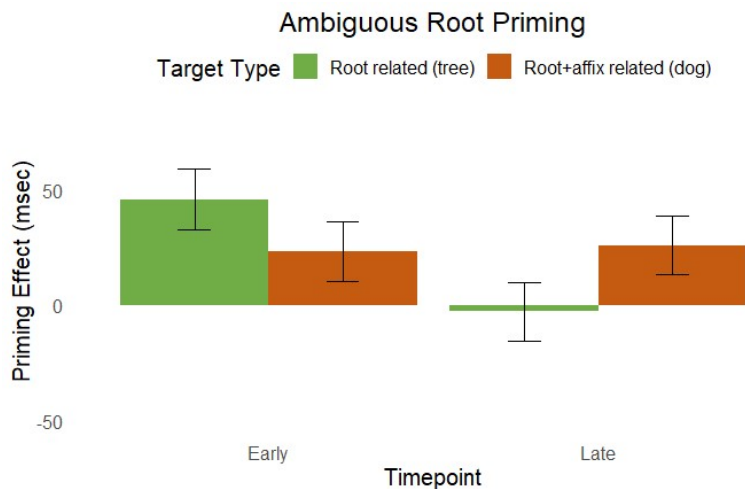


Figure 1: Priming effects ($RT_{\text{UNRELATED}} - RT_{\text{RELATED}}$) for root-only related targets (*Rootfit*) and root+affix related targets (*Formfit*) presented at the root+affix boundary (early) or 500ms after (late).

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Gradual emergence over multiple trials suggests the mismatch negativity (MMN) as an index of learned expectations

The mismatch negativity (MMN) component is one of the most widely researched event-related potentials (ERPs). A search for articles in which either the term “mismatch negativity” or “MMN” occurs *in the title itself* brings up almost four thousand hits (google scholar, September 2023). But there is still ongoing debate regarding the interpretation of the MMN. The component was discovered by Butler (1968) and further described by Squires et al. (1975). Later, Naatanen et al. (1978) proposed a particular analysis and dubbed the component the *mismatch negativity* response. Naatanen et al. (1978) proposed that the MMN is an automatic physiological response that reflects detection of a mismatch from a “memory trace”. The response occurs only when a mismatch is detected; when no mismatch is detected, no MMN response occurs. This interpretation has since become the prevailing view in the literature. However, alternative proposals have also been made. Of particular interest here is the proposal that the MMN is not an all-or-nothing component that is elicited in response to change detection, but rather that it is a gradient response that corresponds to the *degree of expectation* of a stimulus (e.g. Jääskeläinen et al., 2004; May & Tiitinen, 2010). In this study, we present findings that make an important contribution to distinguishing between these two accounts.

We collected ERP data from 16 native German-speaking participants as they passively listened to sequences of stimuli sampled from a bimodal distribution of two Cantonese lexical tones, the mid-level and high-level tones. Participants had no prior knowledge of Cantonese or tonal languages. Sequences consisted of four same (*standard*) stimuli followed by one different (*deviant*) stimulus. There were 8 blocks of 210 stimuli (42 sets of 5 trials in each block), with breaks in between the blocks. Preprocessing was carried out using Fieldtrip toolbox. 1183 trial-channel combinations were excluded (4.4% of the total) due to noise and movement artefacts. Independent Component Analysis (ICA) on unaveraged data was used to isolate and exclude artefacts from blinks and eye movements. Analysis of the preprocessed data was then carried out using Generalised Additive Mixed Models (GAMMs; Wood 2017) and the *itsadug* package (van Rij et al., 2017). We investigated trial-by-trial response amplitude over the course of the block in three time windows, including the usual MMN window 150-200ms post-stimulus.

Results showed a significant MMN response, i.e. a significant difference between the standard (stimulus 4) and deviant (stimulus 5) stimuli in the MMN window (Fig. 1, left). There was also a significant change in response amplitude in the *standard stimuli* over the course of the block, but no significant change in the deviant stimulus (Fig. 1, right; and Fig. 2). The standard and deviant stimuli elicit essentially the same response at the beginning of block (Fig. 2, left and right, dark orange lines); however, with multiple repetitions of the standard stimuli (Fig. 2 left, yellow and amber), the amplitude decreases over the block, but not for the deviant (Fig 2 right). Since the MMN response is calculated by subtracting the standard from the deviant response, this pattern of results suggests that the MMN emerges over time due to changes in response to the *standard* stimuli. We found no evidence for an independent component elicited only by detection of the mismatching deviant.

In summary, the present results provide new evidence concerning the debate surrounding the interpretation of the MMN response. The finding that standard and deviant stimuli initially elicit the same ERP response, combined with the shift of response to the *standard* stimuli over the course of the block, suggest that the MMN emerges as a relative difference in response amplitude due to a relative difference in *expectation* of the different stimulus types. These results are compatible with recent findings suggesting learning of acoustic speech cues occurs a process of prediction (i.e. expectation) and feedback from prediction error (Nixon, 2020; Nixon & Tomaschek, 2021). The MMN may reflect an aspect of the neural correlates of this predictive learning process.

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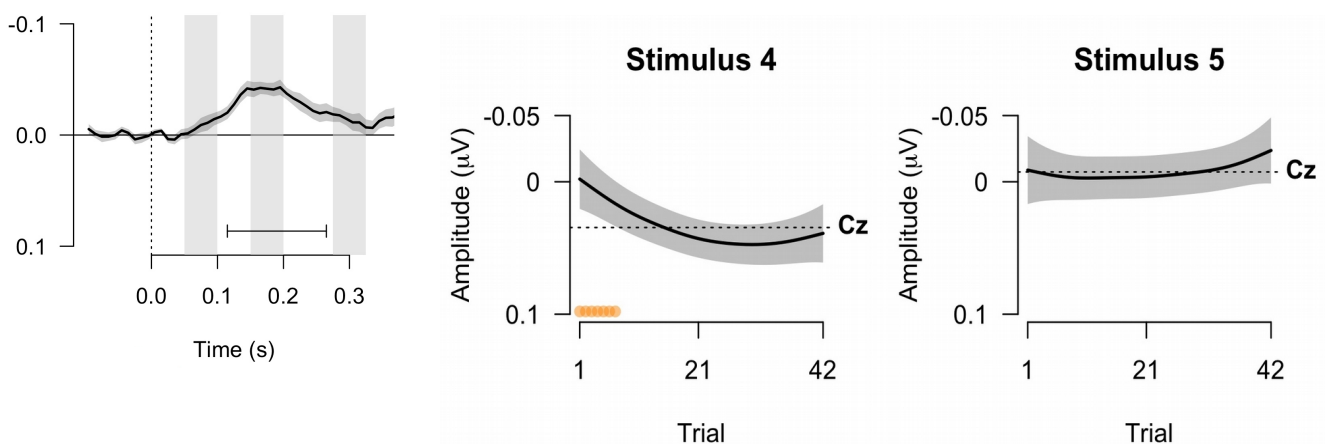


Figure 1. Left: MMN response: significant difference in response amplitude between standard (stimulus 4) and deviant (stimulus 5) between 110–280 ms post-stimulus (time on the x-axis, amplitude on the y-axis). Right: change in response amplitude over the block (trial set over block on the x-axis, amplitude on the y-axis). The plots show a significant reduction in negativity for the standard (stimulus 4) over the course of the block, but no significant change for the deviant (stimulus 5).

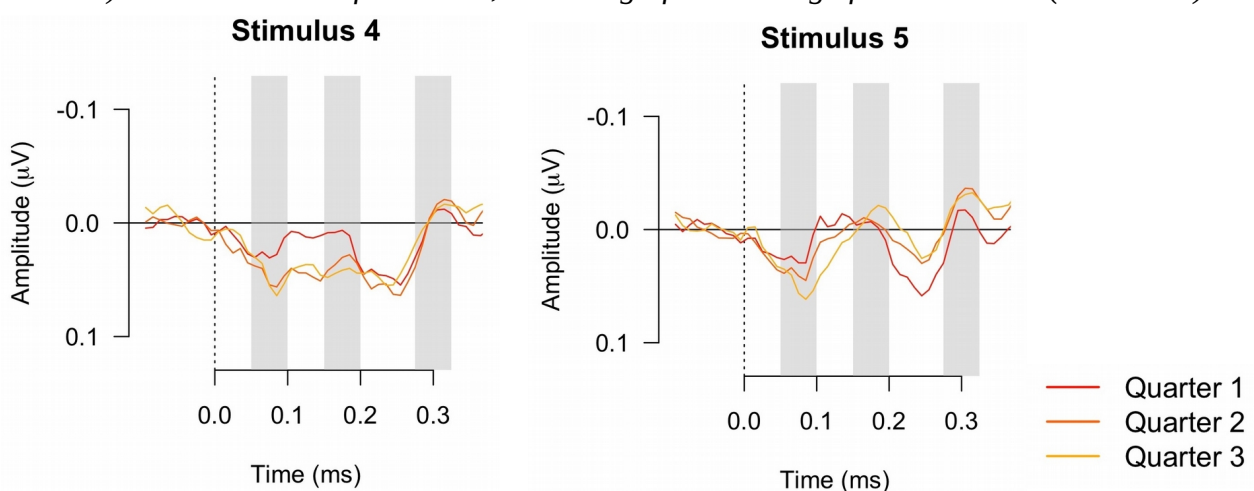


Figure 2. Changes in response amplitude over the block (time is on the x-axis, amplitude on the y-axis, trial within block in grouped into quarters – see legend). In the first quarter of the block (dark orange lines) both stimulus types show a negative peak in the MMN window (150–200ms) with amplitude close to zero. In the later quarters (amber, yellow lines), the standard (stimulus 4) has become significantly less negative, while the amplitude for the deviant (stimulus 5) has not significantly changed.

A study on the processing of verbal inflection of tense and agreement in native Spanish speakers with aphasia.

Introduction

Studies in several languages showed that there is an impairment of verbal morphosyntax in people with aphasia (PWA), which is more pronounced in inflectional tense morphology (Benedet et al., 1998; Caramazza & Hillis, 1991; Friedmann & Grodzinsky, 1997). Faroqi-Shah & Thompson (2007) propose that this deficit is due to a specific difficulty in the retrieval of precise verb forms, which affects temporal reference in general. The Past Discourse Linking Hypothesis (PADILIH; Bastiaanse et al., 2011) suggests that reference to the past poses greater challenges because discourse linking abilities are compromised in PWA.

Objectives

To evaluate the processing of tense and agreement inflection in native Spanish speakers with aphasia.

Methodology

Six (6) PWA native Spanish speakers participated in the study: mean age 46.2 years (SD: 18.03) and high educational level (mean: 16 years; SD: 2.24).

Four tasks were designed: sentence completion and elicitation, grammaticality judgments, and sentence-picture matching.

For the stimuli, we manipulated the temporal reference (past, present, and future) and the subject forms (1p Sg, 3p Sg/Pl). All sentences followed an Adverb-Subject-Verb-Object structure, as in: "*Ayer Juan juntó flores*" / "*Yesterday Juan picked flowers*", "*Ahora Juan y María escuchan un disco*" / "*Now Juan and María listen to a record*", "*Ayer yo besé a mi hijo*" / "*Yesterday I kissed my son*", "*Mañana Juan cosechará las uvas*" / "*Tomorrow Juan will harvest the grapes*".

Results

The participants performed significantly lower in tense inflection compared to agreement ($p < 0.05$). Two groups were formed according to their production pattern: G1 presented significantly lower accuracy in the past forms ($p < 0.01$), and G2 in non-past forms ($p < 0.001$). In comprehension tasks, both groups performed better with past forms in exclusively verbal stimuli and with non-past forms in those that included images.

Discussion

The PWA evidenced difficulties in processing verb inflection that were more pronounced with tense than agreement. They did not seem to show a specific problem with reference to the past, but a general difficulty with the retrieval of precise verb forms (as suggested by Faroqi-Shah & Thompson).

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Table 1. PWA’s accuracy in Time vs Agreement

Participants	Condition	Mean	SD
PWA (6)	T	72.19	15.36
	Agr	76.56*	14.08

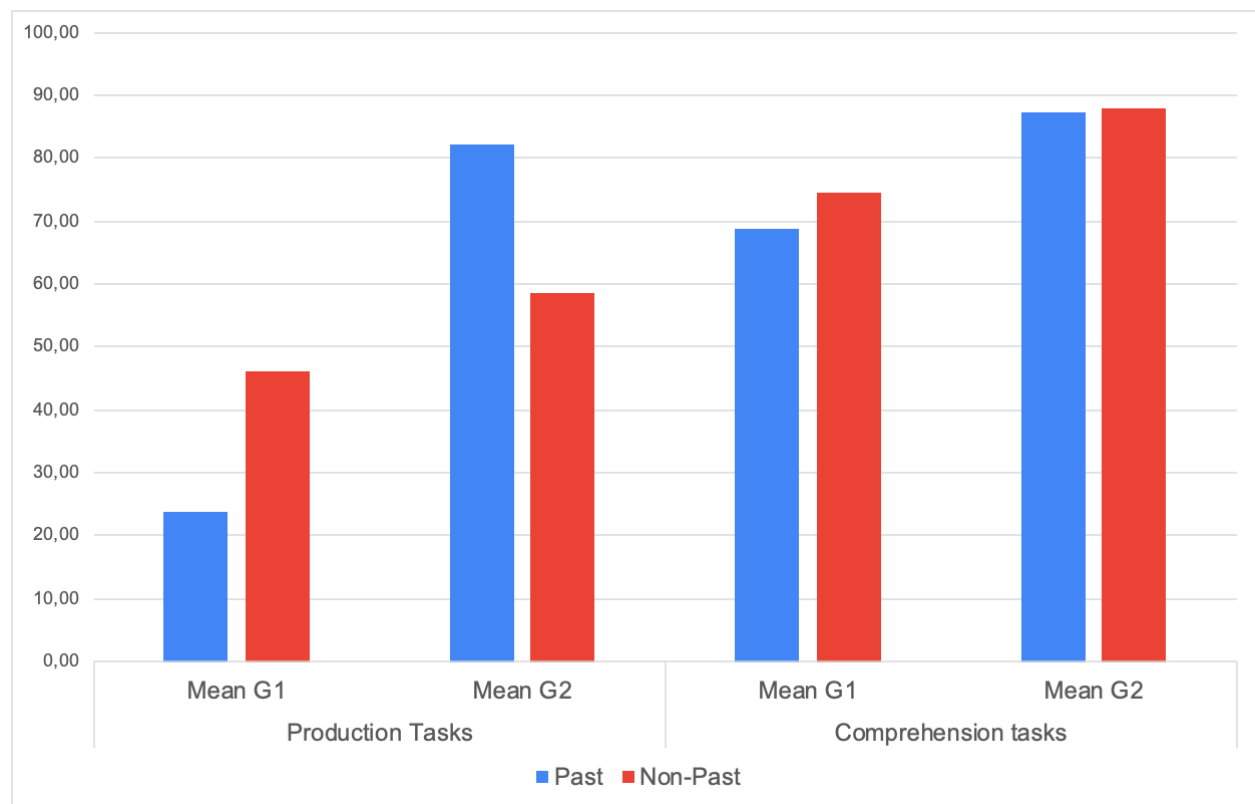


Figure 1. PWA’s accuracy in past vs non-past stimuli by modality and group.

Cultural Immersion and Pragmatic Proficiency: A Study of Language Acquisition in Spain

This study examines Second Language Acquisition (SLA) within the context of undergraduate university students participating in a study abroad program in Seville, Spain. This study offers an examination of the experiences of university students as they embarked on a five-week journey to Spain, emphasizing the significance of pragmatics in the language-learning journey.

Studying SLA in the context of study abroad programs is especially relevant as it allows for a naturalistic examination of language learning in an immersive environment. Studies have shown that immersion in a target language environment can significantly enhance language learning outcomes (Barron, 2003; Cohen & Shively, 2007; Shively, 2011; Alcon-Soler & Sanchez-Hernandez, 2017). According to Krashen's Input Hypothesis (1985), learners acquire language most effectively when they receive comprehensible input that is slightly beyond their current proficiency level. Study abroad programs provide students with real-life situations where they are exposed to authentic language input, facilitating the development of their language skills. These experiences expose learners to authentic language input, fostering substantial linguistic growth (Barron 2003; Shively, 2015). Moreover, pragmatic competence, the ability to use language in context effectively, is becoming increasingly vital in SLA (Kasper & Rose, 2002; Bardovi-Harlig & Bastos, 2011; Bella 2011). Pragmatics ensures that learners not only grasp language structures but also understand the social and cultural nuances, which is particularly relevant for study abroad programs.

The present study recruited participants (n=10) through an undergraduate introductory Spanish language course that provided a study abroad opportunity. The participants embarked on a five-week trip to Seville, Spain. Data collection involved several measures, including pre-post questionnaires and weekly surveys. Prior to their journey, participants completed a pre-test questionnaire covering demographic information, language assessments in both Spanish and English, and questions related to pragmatics. Language proficiency was assessed through English metasyntactic tasks, metalinguistic English tasks, and the Expressive One Word Vocabulary (EOWV) task in both English and Spanish. Throughout their stay, students completed weekly surveys evaluating their Spanish language proficiency, their language usage, and their confidence levels in speaking, writing, and reading. Following their return to Canada, participants completed a final post-test questionnaire.

Interestingly, the study demonstrated that the participants rated themselves as more confident in speaking, writing, and reading Spanish after completing the course and immersing themselves in Spain which exposed them to a higher level of Spanish learning for several weeks. Their Spanish EOWT scores also improved by 10% and their understanding of Spanish pragmatics also increased following completion of the course.

The observed improvement in participants language proficiency and self-confidence supports the idea that immersion in a foreign language environment is conducive to language learning (Barron, 2003; Cohen & Shively, 2007; Shively, 2011). These results reinforce the importance of experiential learning and provide practical implications for language educators and program designers seeking to enhance language acquisition experiences. However, it is essential to acknowledge the limitation of the study, which includes the relatively small sample size. A larger and more diverse sample, in addition to a control group would enhance the study's external validity and provide a more comprehensive understanding of the impact of study abroad experiences on language acquisition.

In conclusion, this study examines the benefits of study abroad programs in promoting second language acquisition, particularly in the context of Spain. Despite the small sample size, the findings hold promise and warrant further investigation with larger and more diverse participant groups. This research contributes to our understanding of the dynamics of language acquisition in a study abroad setting and highlights the need for continued exploration of this valuable educational opportunity.

Polish and Ukrainian Nouns in the Light of a Distributive Analysis

A traditional approach to the study of word structure is concerned with morphemes as the smallest meaningful units of language and with principles of their syntagmatic organization. The relevance of morphemes in comprehension, perception and processing has been also demonstrated empirically (e.g. Taft 1994, Marantz 2013). However, recent work on morphology has shown that the word constitutes an equally insightful unit of linguistic analysis. For instance, Matthews (1974) and Blevins (2016) have argued that sub-lexical units such as stems and inflectional exponents play no role, suggesting that word meaning cannot be conceived in terms of a simple summation of meanings of individual morphemes. The question is whether approaches that have no access to the morphological composition of words can successfully model the properties of words in strongly inflecting languages such as Polish and Ukrainian. To answer this question, we explore the properties of the embeddings of nouns in semantic space using an unsupervised clustering method, t-SNE (van der Maaten & Hinton 2008) and pre-trained 300-dimension word embeddings, obtained with the FastText algorithm (Bojanowski et al. 2017).

The list of Polish nouns was extracted from the National Corpus of Polish (Przepiórkowski et al. 2012). The Ukrainian data was supplied by the General Regionally Annotated Corpus of Ukrainian (Shvedova et al. 2017). We compiled the datasets of 57.000 Polish and 48.836 Ukrainian unique word forms that have a vector retrieved from FastText. The selection of the algorithm was motivated by the fact it is trained on both word co-occurrence and n-grams, offering a more adequate vector representation for morphologically elaborate languages (see Chuang et al. 2022, Nikolaev et al. 2022), compared to e.g. Word2vec.

The analyses were run using the R software (v. 4.2.2; R Core Team 2022). T-SNE plots were generated using the default settings of the *Rtsne* package (Krijthe 2015) and *plotly* (Sievert et al. 2022). The projections of semantic vectors onto t-SNE plots includes the following properties of Polish and Ukrainian nouns: 7 cases (nominative, genitive, dative, accusative, locative, instrumental, vocative), 2 numbers (singular, plural) and 3 genders (masculine, feminine, neuter).

Exemplary plots for the Polish and Ukrainian case systems are presented in Figure 1. The t-SNE maps display clear groupings for both languages. The groupings of words with similar vectors can be traced by colour coding. Each dot represents a vector for a word in a given case, or multiple cases (syncretic forms). A close inspection of the data reveals that in Polish nouns of different gender and number are clustered within the overarching case categories. In Ukrainian, in turn, apart from dative - which forms a separate cluster similarly to Polish (and Russian, see Chuang et al. 2022) - the major case and gender splits are found within the category of number.

In general, the study demonstrates that computational methods have the potential to challenge the idea that morphology exists as an independent linguistic component, and suggests that morphological structure emerges from the interaction between form and meaning. The present study contributes to the understanding of the semantic support for the morphological structure in two Slavic languages. The distinct clustering of Ukrainian and Polish nouns across the numbers, cases and genders aligns with the structural similarities in the paradigmatic patterns of nouns in these languages. However, the different distribution patterns in nouns suggests that the languages have their own linguistic peculiarities that are reflected in their positioning within the semantic space.

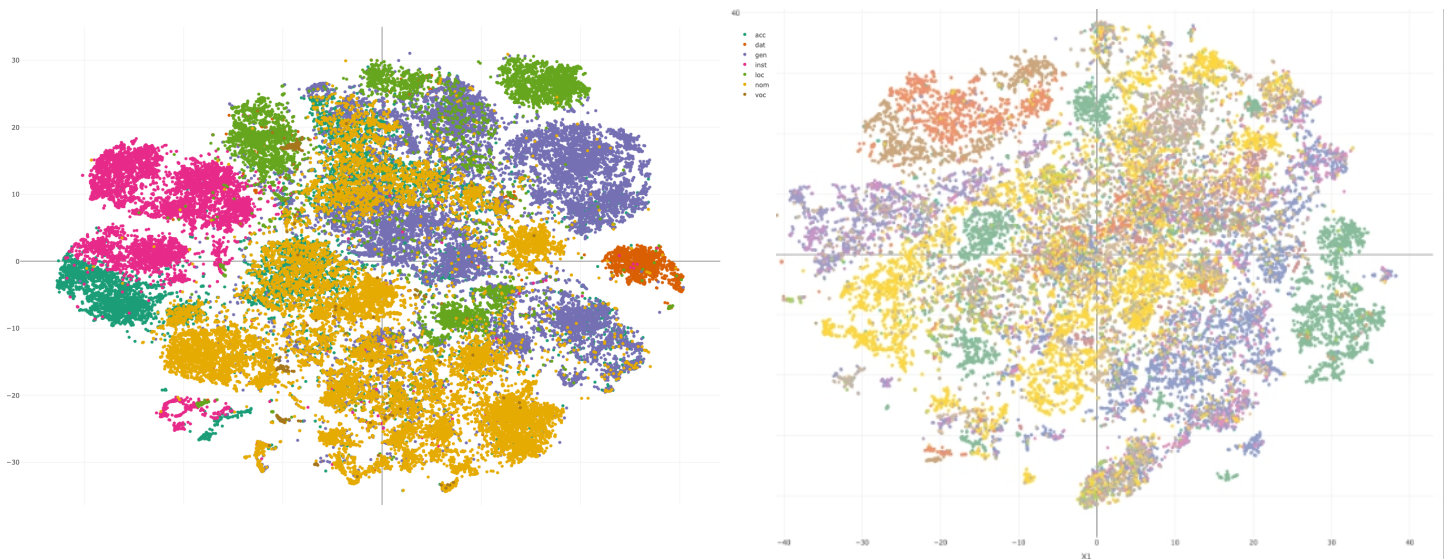


Figure 1: Location in t-SNE plot the Polish (left panel) and Ukrainian (right panel) nouns across the 7 cases.

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Examining the Impact of First Names in Everyday Interactions

The “WEIRD” problem in psycholinguistics underscores the issue of an overemphasis on studying linguistic processes primarily within the context of Western, Educated, Industrialized, Rich, and Democratic countries (WEIRD)¹. Despite the profound personal and emotional significance attached to one’s name, psycholinguistics has not adequately explored personal names, particularly those outside the WEIRD category². Names hold profound significance in shaping our identities, intricately tied to our cultural heritage and history^{3,4}. Although experimental research exists on the challenges associated with having an ethnic first name^{5, 6}, there remains a scarcity of studies that delve into these first-hand experiences^{7,8}.

This study focused on the encounters with name-based interactions from 147 ethnically diverse undergraduate participants from a participant pool. Participants were asked to provide examples of occasions where their first name influenced interactions. Major themes related to first names included differential treatment, experiences of racism, and providing “solutions” to make things “easier” for others. Those whose names fell under the WEIRD category did not experience the above themes but could understand the challenges of having an ethnic first name.

This study underscores psycholinguistics’ need to broaden beyond WEIRD contexts, offering insights into marginalized ethnic groups’ experiences. Moreover, these everyday interactions affected how racialized Canadians felt about their race and ethnic identity. A limitation of the study was the open-ended format of the survey question, which constrained further discussion of these experiences. These limitations will be addressed in my forthcoming Ph.D. dissertation, which will employ semi-structured interviews to delve deeper into these issues.

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Title: Statistical Learning of a Tonal Language in Multilinguals, Bilinguals and Monolinguals

Abstract:

Using statistical learning, language learners can segment words from continuous speech by tracking the co-occurrence probabilities of both segmental features (i.e. consonants, vowels) and suprasegmental features (i.e. stress, tones, intonation) within the input. Works studying the interaction of segmental statistical cues and suprasegmental cues have mainly used artificial languages modelling Indo-European languages (Shukla et al., 2007; Thiessen and Saffran, 2007).

Given that tonal languages are estimated to comprise 60-70% of the world's languages (Yip 2002), it becomes imperative to investigate how learners use segmental statistics in the presence of suprasegmental cues prevalent in tonal languages. It is especially interesting to study those with no prior exposure to tonal languages. Previous studies have indicated that unfamiliarity with tones often leads monolingual non-tone adult speakers to exhibit difficulties in perceiving, producing, and remembering the lexical tones of words in tonal languages (McGinnis, 1997; Wong & Perrachione, 2007; Wang & Saffran, 2014).

While there is preliminary evidence suggesting that bilinguals with no tonal language experience can overcome this unfamiliarity and successfully segment words of a tonal language (Wang & Saffran, 2014), nothing is known about trilinguals and quadrilinguals who contend with an added layer of complexity in their daily use of language. In this study, we exposed monolinguals, bilinguals, trilinguals, and quadrilinguals to an artificial tonal language, in which word boundaries were signaled by both syllabic and tonal transitional probabilities. Notably, none of the participants had previous experience with tonal languages.

The results indicated that all groups were successful in learning the tonal language despite having no previous experience with tonal languages. However, bilinguals, trilinguals, and quadrilinguals significantly outperformed monolinguals, suggesting that experience with multiple languages might enhance the tracking of multiple cues. Interestingly, quadrilinguals also significantly outperformed bilinguals indicating that these groups might have distinct learning characteristics and capacity and should not be treated as one.

Keywords: Statistical Learning, tonal language, word segmentation, bilingualism, multilingualism

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Title: Moving Towards an Understanding of the Role of the Inferior Fronto-Occipital Fasciculus in Language Processing

Background: Multiple studies have indicated that there is a clear structural distinction between the dorsal and ventral portions of the IFOF (Rollans et al., 2015; Martino et al., 2010). Recently, it has been proposed that there might also be a functional differentiation of the IFOF. Current literature reveals three main hypotheses/schools of thought with regards to the functional frameworks of the dorsal and ventral components of the IFOF. There is the phonological vs. semantic processing hypothesis (Jobard et al., 2003; Klingberg et al., 2000; Steinbrink et al., 2008), the difficult vs. non-difficult task processing hypothesis (Lopez-Barroso et al., 2011; Brauer et al., 2010) and the automatic vs. non-automatic processing hypothesis (Dávolos et al., 2020; Posner & Raichle, 1994).

Research Goal: This project aims to disentangle the three main hypotheses and determine which best describes the role(s) of the ventral and dorsal IFOF in language processing. Our proposed hypothesis for the roles of the ventral and dorsal IFOF in each model are outlined in Table 1.

Methods: Retrospective behavioural data from 32 skilled and dyslexic individuals was analyzed. MRI images were acquired from each participant, and they completed behavioural tasks that differentially rely on the aforementioned processes (i.e., phonological vs. semantic; easy vs. difficult; non-automatic vs. automatic). Explore DTI was used to isolate the dorsal and ventral IFOF in each participant. SPSS Statistics were used to complete the statistical analysis. FA and MD values from the dorsal IFOF and ventral IFOF were correlated with accuracy rates from each task.

Results: In skilled readers, a significant relationship was observed between the FA of the dorsal IFOF and performance on a task (OA) classified as ‘non-automatic’ (Figure 1). In readers with dyslexia, a significant relationship was observed between the FA of the dorsal IFOF and performance on a task (MA) classified as ‘non-automatic’ (Figure 2). No other significant relationships were observed with the dorsal or ventral IFOF and any other behavioral tasks.

Conclusions: The correlation between the dorsal IFOF and the OA task in skilled readers, and the correlation between the dorsal IFOF and the MA task in readers with dyslexia partially supports the automaticity hypothesis as this is the only hypothesis that associates the OA (and MA) tasks with the dorsal IFOF. This hypothesis is not fully supported as we did not observe any of the predicted relationships with the ventral IFOF. Due to the caveats in our findings, it might be that case that the three proposed theories are over simplifying the role of the IFOF in language processes. To fully understand this tract, a larger, big-picture examination of the connectivity between different brain regions, which should include functional connectivity as well as structural connectivity, might be more useful than observations of isolated and static tracts.

	Dorsal-IFOF	Ventral-IFOF
Phonological-semantic hypothesis	P, OP, PA	O, OA, MA
Difficulty hypothesis	P, MA	O, OP, PA, OA
Automaticity hypothesis	P, OA, PA, MA	O, OP

Table 1. Project hypothesis, showing the expected findings that would support the three current theories about the functional distinction of the IFOF. O= Orthographic spelling task, OP = Orthographic-Phonological spelling task, P = Phonological spelling task, OA = Orthographic awareness, PA = Phonological awareness, MA= Morphological awareness.

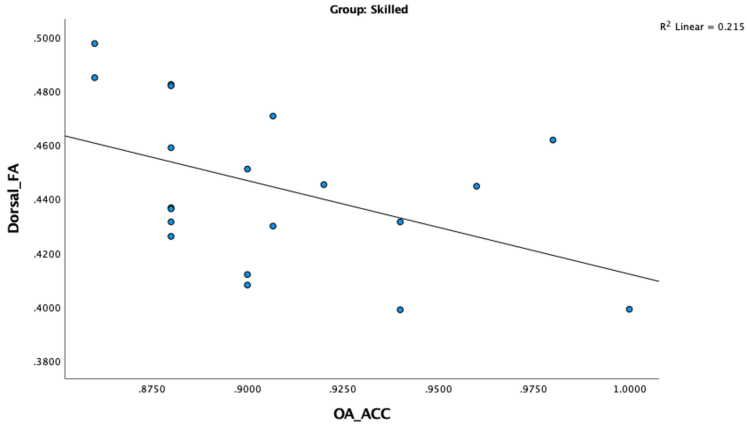


Figure 1: Scatterplot showing the significant relationship observed between the FA of the dorsal component of the IFOF and performance on the orthographic awareness task ($r = -0.464$, $p = 0.039$).

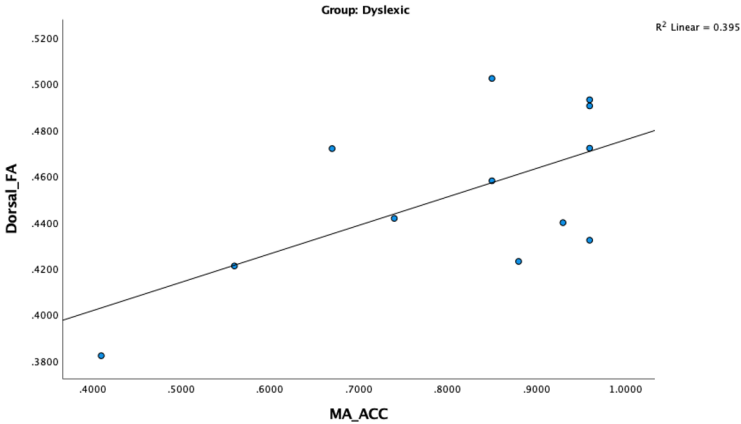


Figure 2: Scatterplot showing the significant relationship observed between the FA of the dorsal component of the IFOF and performance on the morphological awareness task ($r = -0.628$, $p = 0.029$).

The role of *LexiaCore5 Reading* in a bilingual context: developing phonological awareness skills in English (L2)

The usage of digital platforms may be an important tool in a bilingual teaching environment, as it may foster phonological awareness skills in the students' two languages. Based on a Complex Dynamic Systems perspective (LARSEN-FREEMAN; CAMERON, 2008; LARSEN-FREEMAN, 2015, 2017; DE BOT; LOWIE; VERSPOOR, 2007; DE BOT, 2015, 2017), this proposal offers a process analysis of how a 3rd-grade student develops phonological awareness skills in a bilingual (Portuguese-English) context in Brazil. To support the enhancement of the learner's metaphonological skills, the school implemented the online platform Lexia Core5 Reading (LEMIRE, 2021) as part of its curriculum. The purpose of this presentation is to share the findings and insights generated in the analysis.

We carried out a longitudinal analysis (throughout 4 months, with 41 data points), grounded in Complex Dynamic Systems Theory - CDST (LARSEN-FREEMAN; CAMERON, 2008; LARSEN-FREEMAN, 2015, 2017; DE BOT; LOWIE; VERSPOOR, 2007; DE BOT, 2015, 2017), consisting of Peak Analyses with Monte Carlo simulations on 'total time spent in performing the activities' and 'number of attempts'. By identifying sudden "jumps" in each one of these two dependent variables, we addressed which of the activities proved easier/more difficult to the learner, and discussed these results considering the phonological awareness skill addressed in each one of the activities.

The digital platform contributed to promoting instability in the learner's linguistic system. This instability in 'total time spent in performing the activities' data can be seen as an indicator of progress in the development of English as a second language (L2) within a bilingual context. The Peak Analysis with Monte Carlo simulations revealed that certain tasks were more challenging for the learner, particularly those that required more complex phonological awareness skills such as word and sound segmentation tasks.

The findings of this study offer valuable insights into the development and use of digital platforms in bilingual contexts. Firstly, when designing new platforms, digital creators should consider linguistic aspects pertaining to the students' both languages in order to foster engagement. When it comes to phonological awareness, certain skills are more complex than others and should be structured in a progressive manner, starting with the less complex ones. As noted by Larsen-Freeman (2015), understanding the factors that affect language development implies considering the interconnectedness of the learners' language systems. Finally, teachers play a crucial role in facilitating connections among the various processes that occur in language learning. In this sense, teachers need to actively intervene in the development process by assigning tasks that can help students progress in the activities proposed in the platform.

How does income inequity and culture influence oral language and literacy practices in the Black communities of Montreal?

Purpose: The purpose of this study is to examine oral language and literacy practices within this community and to work to understand how variances in these practices are driven by income inequality and cultural differences. Furthermore implications on early language and reading skills and educational outcomes will be examined.

Research: Income inequality has a negative impact on the educational outcomes of children (Calzada et al 2015; Evans, Shaw & Bell, 2000; Ferguson et al., 2007; Hernandez, 2011). Children living in low-income homes face interrelated challenges (for example: financial and mental hardships, as well as low self-esteem) which can influence learning and language outcomes (Bradley & Corwyn, 2002; National Center for Health Statistics, 2012; Roberts, Jurgens & Burchinal, 2005). Individuals in these communities are also affected by the *deficit ideology*, a prominent societal view that postulates that poverty is caused by “ethnic, dispositional and spiritual deficiencies” (Gorski, 2016, p. 380). These so-called deficiencies lead to less school involvement and a questioning of the value of education which have been linked to the existing “achievement gap” (Gorski, 2016). Despite increasing attention in research, the achievement gap in reading and across other domains remains high in both the United States and Canada (Beese & Liang 2010; Bernstadt, Kitmitto, Ogut, Sherman & Chan, 2015). There remains an apparent breakdown in the continuous educational success of children living in poverty.

In Canada, less research has been done to explore differences in home-based literacy practices (see Sénéchal, LeFevre, Thomas, & Daley, 1998; Sénéchal, & LeFevre, 2002) where we may understand how the achievement gap manifest in homes. Studies by Sénéchal and colleagues examined informal (interaction with print) and formal (emphasize the print) practices in the homes of children from middle and high SES over a five-year period. They found that parents’ engagement with reading and writing was related to early literacy skills which correlated with the children being able to read in grade one. In Montreal, research exploring the education outcomes and reading practices of the sub-set of black children of immigrant families of low SES has not been established. While limited research conducted in the US has examined the literacy practices used in the low-income homes of Black and minority children (Jarret et al., 2015; Roberts, Jurgens et al., 2005; Sawyer et al 2018), there is a dearth of corresponding work in a Canadian or Quebecois context.

Methods: In this first phase six participants were recruited from the greater Montreal area using Tanya Talks recruitment and informational workshops. The workshops were held at local community organizations who provide services to low-income Black communities. The methods employed include community-based participatory, ethnographical measures, literacy questionnaires and shared book-reading dyads. Further data collection is planned in Montreal and North Carolina for comparative purposes.

Results: The emerging themes include a definite understanding about the importance of education, yet these families face hardship with accessing resources and living in neighborhoods where resources are not available. There are existing differences and similarities in the literacy practices employed across households. There are also similarities with literacy practices used in mainstream middle and upper middle class white families in Canada.

Conclusions and Significance: Preliminary findings from the participant data indicate certain pre-literacy practices similar to those found in other communities while other practices differed. Where differences were found, links to income inequality and cultural differences are to be investigated.

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A Cognitive linguistics Study of the Feminine Meanings Embedded in the Construction of Chinese words with the Radical “女” with Dichotomies

Pu Meng

George Mason University

The gender characteristics of language have attracted many researchers to analyze in different languages: binary gender study of English “they” (Bjorkman, 2017); Paradigm Uniformity and the Gender System in French (Bonami & Boye, 2019); gender determination problem in Korean names as a first step for solving a zero pronoun problem in Korean (Yoon et al., 2008), etc. About Chinese, I think of a side radical “女”. It means female, feminine. People have never stopped the in-depth exploration of words in Chinese, because it is worth exploring in terms of morphology, word formation, historical linguistics, and even language teaching. Most Chinese linguists believe that the Chinese words with the radical “女” have a female meaning, which is distributed in the source, object, use, attribute, and so on. Guosheng Ding (2000) studied that the single word “女” and the radical “女” have the same unit activation from the perspective of psychology. The radical can be used in word analogical reasoning; for example, if we divide “王子” (prince) into “王” (king) and “子” (son), we are more likely to predict “女王” (queen). Instead of the correct answer is “公主” (princess), because “女王” contains the word “女”. Because “女王” contains the word “女”, and “女” is usually the opposite of “子”. (Yin et al., 2016) Chia-Ying Lee and collaborators in their research on “Consistency, Regularity, and Frequency Effects in Naming Chinese Characters”. It holds that the radical “女” is a Chinese language unit in semantics. (Lee et al., 2005) In 2000, Marcus Taft, Xiaoping Zhu, and Guosheng Ding studied the relationship between words and radical representation in Chinese. The radical “女” is divided into the radical on the left and the radical on the right to separate the study. These studies have analyzed the radical “女” from different aspects and promoted the understanding of it for both native Chinese speakers and non-native Chinese speakers.

As a very characteristic and one of the few radicals with gender significance, “女” has certain research value. This study will focus on using dichotomies to analyze the Chinese radical “女”, those with female meaning or gender meaning, those without; And the reasons behind the words. The Academia Sinica Corpus will be used for the retrieval and analysis of Chinese written materials. Chinese word objects include simplified Chinese words and traditional Chinese words. For example, simplified Chinese words: “妈” (mā) - Mother, “姐” (jiě) - Older Sister, “妹” (mèi) - Younger Sister; Traditional Chinese words: “媽” (mā) - Mother, “姊” (jiě) - Older Sister, “婦” (fù) - 婦女 (Woman). Although some Chinese words have female words, their meaning has nothing to do with females themselves but is related to other concepts or meanings. The meaning of a Chinese word is usually related to its constituent parts and context, and sometimes may not be directly reflected in the glyphs. Therefore, when understanding Chinese words, it is necessary to consider their context and usage. In this study, dichotomies are used to divide words with radical “女” into words with female meanings, such as:

“妈” (mā) - 母亲 (Mother)

“姐” (jiě) - 姐姐 (Elder Sister)

“妹” (mèi) - 妹妹 (Younger Sister)
“她” (tā) - 她 (She/Her)
“婆” (pó) - 婆婆 (Mother-in-law)
“嫂” (sǎo) - 嫂嫂 (Sister-in-law, elder brother’s wife)
“媳” (xí) - 媳妇 (Daughter-in-law, son’s wife)
“妇” (fù) - 妇女 (Woman)
“娘” (niáng) - 娘娘 (Mother, informal term)
“婶” (shěn) - 婶婶 (Aunt, father’s sister)

And words that do not have feminine meanings, such as:

“姓” (xìng) - 姓氏 (Surname)
“妙” (miào) - 妙计 (Clever plan)
“妥” (tuǒ) - 妥善 (Proper)
“姻” (yīn) - 姻缘 (Marriage fate)
“妨” (fāng) - 妨碍 (Obstruct)
“妒” (dù) - 妒忌 (Jealousy)
“妊” (rèn) - 妊娠 (Pregnancy)
“妄” (wàng) - 妄想 (Delusion)
“姿” (zī) - 姿态 (Posture)

Then, words that do not have female meanings, such as “姓” (xìng) - 姓氏 (Surname), were analyzed. This Chinese word can be analyzed from two points why the word itself does not have a female meaning but still retains the side radical “女”. First, the primitive society was matriarchal; Second, it is women who conceive and give birth to life, so that the family bloodline continues. Another example is “姿” (zī) - 姿态 (Posture). The word originally described the slender body of a woman but has since been extended to describe the posture of a man and even the use of anthropomorphism to describe objects. Words that analyze causes are divided into corresponding categories and cross-categories. This study classifies and analyzes Chinese words with partial radical “女” by using the dichotomous method so that people can have certain categories when learning and using these Chinese words, which is convenient for memory and correct use according to context.

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Do semantic primes influence the motor execution of keystrokes during the typing of words?

Typing is a complex activity that involves identifying and encoding the to-be-typed word, accessing its meaning, planning, and executing the keystrokes. Studies investigating whether the semantic information from the context a word is embedded in influences the implementation of the motor response in typing that word (e.g., Chen et al., 2023; Scaltritti et al., 2017) show mixed results. We investigate whether the typing output of words is influenced by contextual semantic information from semantic primes, and whether this effect depends on the time given to process the prime.

Semantic priming refers to the facilitation in processing that a target (e.g., doctor) receives from a related prime (nurse) compared to an unrelated prime (bread). The stimulus onset asynchrony (SOA) is the time between the onset of the prime and the onset of the target, and is thought to influence the locus of the semantic priming effect. At shorter SOAs, the benefit to the target is thought to reflect the automatic spreading activation from the prime. At longer SOAs, the benefit of the prime is thought to additionally reflect strategic processes, such as expectations of words likely to follow the prime. While semantic priming has been widely studied in word recognition, few studies have examined semantic priming in word typing. Scaltritti et al. (2017) found that related (vs. unrelated) semantic primes sped up the initiation of the first keystroke of the target, suggesting the facilitation from the semantic prime may influence the linguistic processing of the target and the preparation of the motor response. Importantly, Scaltritti et al. also found some evidence that the semantic primes sped up the interval between the first and second keystrokes of the target word, suggesting that semantic primes may also influence the implementation of the motor response when typing the target word.

Our experiment examines how automatic and strategic processes in semantic priming influence the typing latencies of target words. Specifically, we examine the time to initiate the first keystroke and the subsequent production of the target word when the prime and target are separated at a short SOA and a long SOA. The information from strategic processes present at a longer SOA may be more likely to persist throughout the typing of the target word. At a longer SOA, primes may thus facilitate the linguistic processing of the target, resulting in a faster initiation of the first keystroke, and importantly, be more likely to influence the implementation of the keystroke execution, resulting in faster typing latencies for the subsequent letters. We aim to shed light on the ways in which linguistic context shapes the production of written language.

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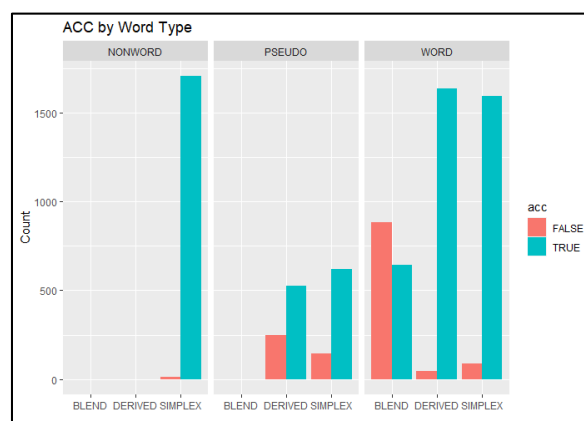
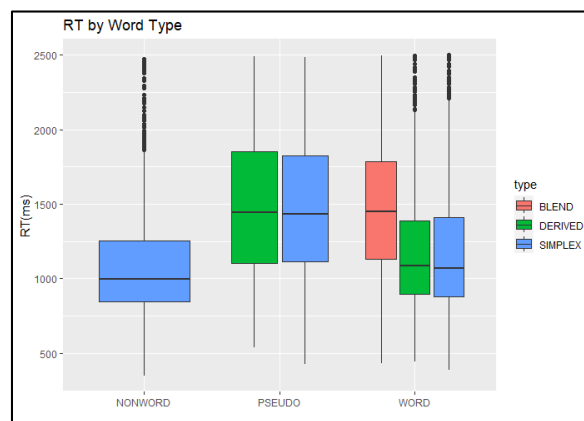
Lexical decision and eye-tracker behavior in Brazilian Portuguese blend processing

Abstract: This work investigates the processing of blends in Brazilian Portuguese (BP). Blends are considered a special type of compounding as a word formation process that juxtaposes or superimposes word segments (clip), or a word and a word segment (e.g., ww[bara[t]onta], wc[forro]gode), cw(trafi[crente], cc(pensa)(geiro)) (Villalva; Minussi, 2022). Blend's representation and processing have raised interesting questions about theoretical descriptions of their internal structure and about the way they are treated in empirical models of the mental lexicon and lexical access (Minussi; Villalva, 2020). It is worth mentioning that different experimental paradigms have been researching the representation and processing of compound words and blends (Juhász; Johnson; Brewer, 2017; Schmidtke; Van Dyke; Kuperman, 2021), yielding interesting evidence to a better understanding of their representation and processing. However, most part of the experimental studies data come from different languages, other than BP. Therefore, the present study aimed to precisely fill this gap, investigating the processing of blends in BP. For this purpose, we applied a behavioral experiment with lexical decision task coupled with eye-tracking (Kuperman; Deutsch, 2020). We manipulated the blends in i) linear structure (i.e., WordW, WClip, CW, CC) and ii) syntactic structure (i.e., HeadH, HModifier, MH). Further, we also tested derived words with different morphological structures (i.e., PrefixRoot, RootSuffix) and simplex words (i.e., Root). Thus, for the negative responses in the lexical decision experiment, we used nonwords, simplex pseudowords, and derived pseudowords. The accuracy and reaction time results suggest that blends are being mainly categorized and processed differently from derived words, but such as pseudowords. There was an interaction between the structures in the CW blends, indicating that this kind of blends are processed differently than the other, in a more morphological decomposed fashion. Afterwards, the eye-tracking results indicated larger fixations in the first constituent when it was a clip (i.e., CC and CW), suggesting the needing of more time to decompose the constituents when the frontier between them is less clear than a word. In this sense, we now have a broader picture of the blend structure, representation, and processing, shallowing the questions about the processes for the recognition of this type of words in lexical access. We hope these results will contribute to a better understanding of morphological processing from an empirical perspective related to theory.

Keywords: Morphological Processing; Blends; Lexical Access; Eye-Tracking.

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Poster Session 3 – Saturday Morning

02. Revisiting the orthographic prediction error for a better understanding of efficient visual word recognition	WANLU FU (University of Cologne)*; BENJAMIN GAGL (University of Cologne)
03. A binary-tree approach to generating imaginary Chinese characters	Yixia Wang (Tilburg University)*; Rastislav Hronsky (Tilburg University); Emmanuel Keuleers (Tilburg University)
04. Language evolution within simulated multilingual societies: Evidence from the iterated learning paradigm	Chaimaa El Mouslih (McGill University)*; Vegas Hodgins (McGill University); Pauline Palma (McGill University); Debra Titone (McGill University)
05. How do Turkish readers decide whether to skip parafoveal short and high-frequency words?	Zeynep G Ozkan (Universidad de Valencia)*; Francisco Rocabado (Universidad Nebrija); Jon Andoni Duñabeitia (Universidad Nebrija); Bernhard Angele (Universidad Nebrija)
06. Verb aspect processing in monolingual and bilingual heritage speakers of Turkish	Özce Özçeçelik (Leibniz-Center General Linguistics); Nisa Büyükyıldırım (Leibniz-Center General Linguistics); Ulaş Aşkın (Leibniz-Center General Linguistics); Serkan Uygun (Bahçeşehir University); Onur Özsoy (Leibniz-Center General Linguistics)*
07. Learning to Read Connections - Sensitivity to Collocation Frequency and its Relation to Vocabulary Size and Reading Comprehension	Alexandra M A Schmitterer (University of Paderborn)*; Caterina Gawrilow (University of Tübingen); Claudia Friedrich (University of Tübingen)
08. Cross-linguistic differences in recognition memory: Encoding of event roles in Japanese and English	Jiashen Qu (Nagoya University)*; Koji Miwa (Nagoya University)
09. The Emotional Impact of Lexical Arousal on Foreign Language Vocabulary Learning	Zahra Zalzadeh (Persian Gulf University)*; Fatemeh Nemati (Persian Gulf University); Mehdi Purmohammad (University of Alberta)
10. The influence of word Frequency, length, and morphological structure on a lexical decision task	Carina G. Pinto (IPLeiria)*
11. WHERE THE U-SHAPE GONE? POST COVID-19 CHANGE IN THE RELATIONSHIP OF EMOTIONAL VALENCE AND AROUSAL OF WORDS	Milica Popović Stijačić (Faculty of Media and Communications, Singidunum University)*; Ksenija Mišić (Laboratory for Experimental Psychology, Faculty of Philosophy, University of Belgrade); Dušica Filipović Đurđević (Department of Psychology, Faculty of Philosophy, University of Belgrade)

12. Demonstratives, deixis, and relationality: the cognitive pragmatics of augmenting	Poulami Chakraborti (University of Hyderabad)*
13. Psycholinguistic Determinants of Timed Object Naming in Thai	Benjamin Clarke (Thammasat University)*
14. ANTHROPOMORPHIC PROPERTIES OF LANGUAGE CONSCIOUSNESS	Ekaterina A Redkozubova (Southern Federal University)*
15. Eye-movement patterns during paragraph reading in adolescents with different reading-related skills	Alexandra A Berlin Khenis (Sirius University)*; Marina Norkina (Sirius University of Science and Technology); Elena Semenova (Sirius University of Science and Technology); Anastasia Streltsova (Sirius University of Science and Technology); Tatiana Logvinenko (Sirius University of Science and Technology)
16. Exploring the limits of language non-selectivity: How do multilinguals process non-native cognates and interlingual homographs?	Lisan Broekhuis (University of Antwerp)*; Dominiek Sandra (University of Antwerp); Sarah Bernolet (University of Antwerp)
17. One form, two meanings? The semantics of generic and specific role nouns in German	Dominic Schmitz (Heinrich Heine University Düsseldorf)*
18. Examining the electrophysiological signature of interletter spacing on visual word recognition: An ERP study	Teresa Civera (Universitat de Valencia)*; Marta Vergara (Universitat de Valencia); Manuel Perea (Univeristat de Valencia)

Revisiting the orthographic prediction error for a better understanding of efficient visual word recognition

Abstract

Research Background: Recent evidence suggests that readers optimize low-level visual information following the principles of predictive coding. Based on a transparent neurocognitive model, we postulated that readers remove redundant visual signals to focus on the informative aspects of the percept, i.e., the orthographic prediction error (oPE, Gagl et al., 2020).

Research method: Here, we test alternative oPE implementations by assuming all-or-nothing signaling units based on multiple thresholds (i.e., output modality of a neuron). Further, we tested if readers signal predictions from one or multiple neuronal units. For model evaluation, we compared statistical model fits of the new oPEs with each other and against the original formulation based on behavioral and electrophysiological data (EEG at 230, 430 ms).

Results: We found the highest model fit for the oPE with a 50% threshold integrating multiple prediction units for behavior and the late EEG data. The early EEG data was still explained best by the original hypothesis.
Conclusion: Thus, the new formulation is adequate for late but not early neuronal signals, indicating that the prediction error representation, which likely implements lexical access, changes over time.

Keywords: Visual word recognition; Visual-orthographic processing; Predictive coding; EEG; Behavior

Key Reference: Gagl, B., Sassenhagen, J., Haan, S., Gregorova, K., Richlan, F., & Fiebach, C. J. (2020). An orthographic prediction error as the basis for efficient visual word recognition. *NeuroImage*, 214, 116727.

A binary-tree approach to generating imaginary Chinese characters

Psycholinguistic tasks such as lexical decision and nonword reading require presenting participants with stimuli that follow the conventions of a language's writing system, but that are not attested in that language. For alphabetic languages, these stimuli are known as pseudowords or imaginary words (Meara, 2012). Various approaches to generating pseudowords in alphabetic languages have been proposed, with different levels of sophistication (Duyck et al., 2004; Keuleers & Brysbaert, 2010; Testolin et al., 2015; Westbury et al., 2007).

Languages which represent words using ideographic characters, such as Chinese, require distinct methods. The radical-based approach (e.g., Sze et al., 2014) generates pseudocharacters by combining a radical from one character with the residual component from another. The stroke-based approach (e.g., Tsang et al., 2018) works by adding or removing one or more of an existing character's strokes. However, these approaches do not take full advantage of the hierarchical nature of Chinese characters. For instance, the residual component of a character is often made up of further subcomponents arranged in a certain layout (possibly again forming a standalone character).

As an alternative, we propose a method which describe characters by a binary tree, where non-terminal nodes contain information about lay-out and terminal nodes contain stroke patterns. Pseudocharacters can be formed by manipulating of these binary trees by insertion, deletion, or substitution of nodes (see examples). Using this approach, we can capture character hierarchy in the resulted pseudocharacters and manipulate character-likeness by manipulation of nodes at varying levels (see figures 1, 2, and 3). The binary-tree representation may offer substantial benefits for generating stimuli in psycholinguistics experiments involving Chinese characters.

keywords: visual word recognition, lexical decision, mandarin Chinese

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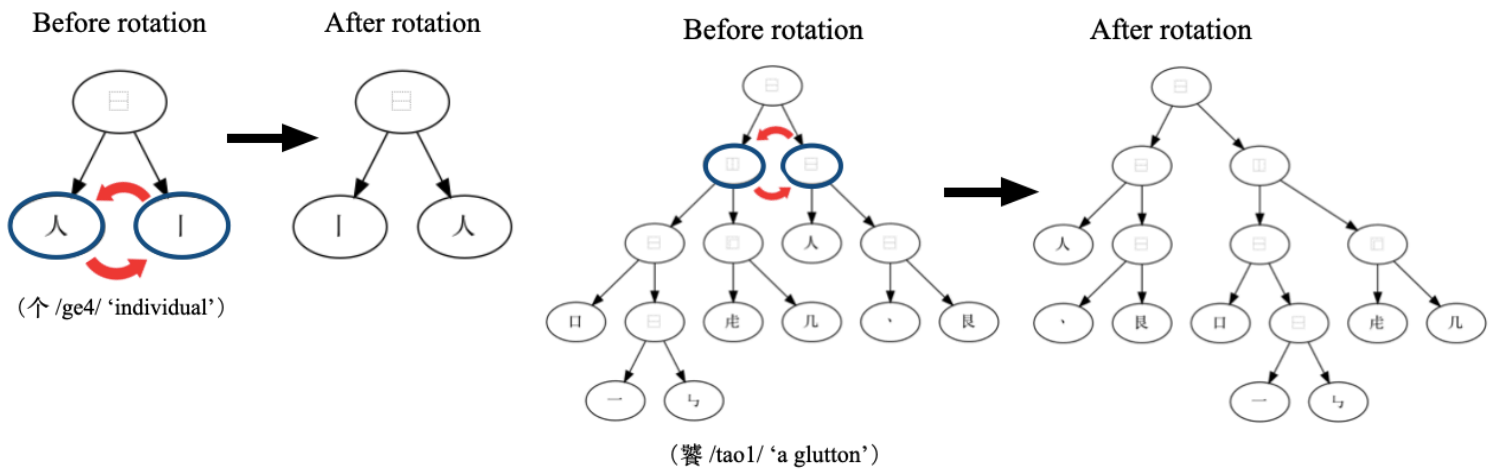


Figure 1: Examples of node rotation. In the left panel, leaf nodes rotate, while in the right panel, internal nodes rotate. Manipulation of the internal nodes affects the subtrees.

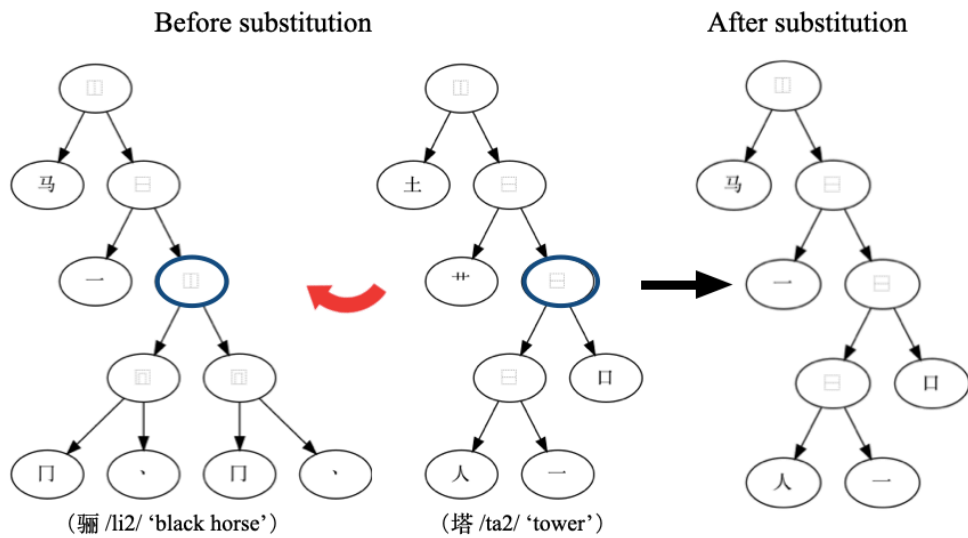


Figure 2: Examples of node substitution.

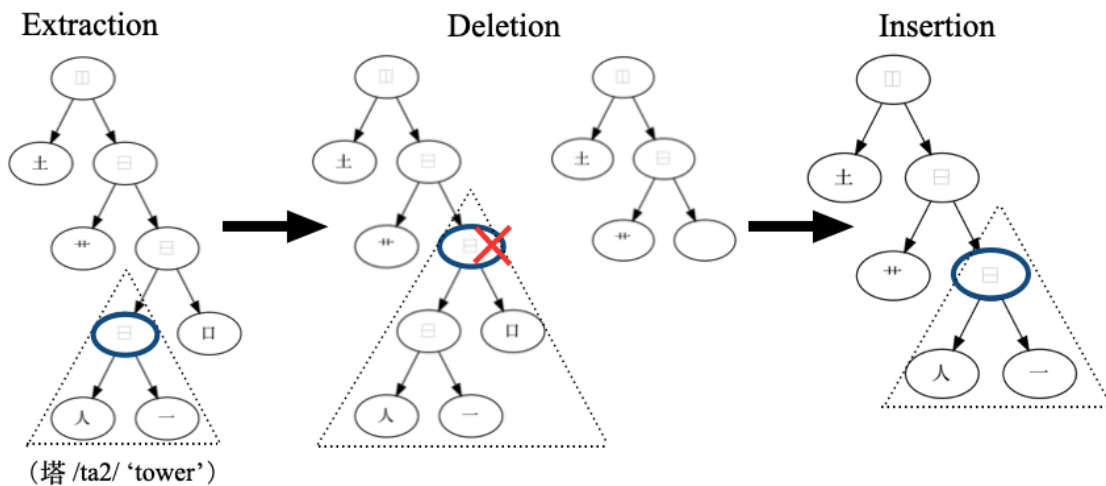


Figure 3: Node substitution takes three steps. The process consists of the extraction of a target node and the deletion of a selected node, leaving a destination for the insertion of the target node.

**Language evolution within simulated multilingual societies:
Evidence from the iterated learning paradigm**

El Mouslih, C., Hodgins, V., Palma, P., Titone, D.

Abstract

Previous iterated learning studies (Kirby et al. 2008; Kirby et al. 2014) that studied language evolution in the lab have focused on monolingual populations. The present study aims at broadening the literature by examining how two populations of bilingual speakers influence the evolution of two types of artificial languages (French-like and English-like). We recruited 64 English-French bilingual participants; 32 participants were English-dominant, and 32 were French-dominant. Participants were split into 8 groups based on their L1, and each participated in two iterated learning tasks, one on each artificial language. The artificial languages were created in the lab and consisted of nonword-picture pairings combined with an audio file. The nonwords in each alien language were made of the same syllables, but differed in the presence or absence of diacritics and in the pronunciation heard in the audio file. We used transmission error and systematicity as a measure of learnability and structure, respectively, and also measured number of unique words. Results indicated that while both languages increased in learnability and structure over generations, French drove an interaction effect at both the level of the language and the speaker. French-L1 participants applied greater structure over generations in both languages, French-like languages showed greater structure overall and also contained more unique words. These results show that both the speakers' prior linguistic biases (i.e. their L1) and the intrinsic features of the language (e.g. French-like diacritics) influence linguistic cultural transmission. This is evidence for a bidirectional relationship between our cognitive processes and the languages that we speak.

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How do Turkish readers decide whether to skip parafoveal short and high-frequency words?

Readers tend to skip frequent and easy-to-process words. Word skipping is essential to efficient reading. However, it is not clear how readers decide whether to skip a word. This research aims to investigate how Turkish readers use parafoveal information to plan their eye movements. Angele and Rayner (2013) used a gaze-contingent display change paradigm (Rayner, 1975) and found that readers tend to skip parafoveal previews of the article "the" even if they were not compatible with the preceding sentence context, suggesting that parafoveal information about the upcoming word trumps contextual information. However, it is not clear whether this phenomenon is universal across all languages. So far, it has only been studied in English and Chinese, which, despite having a lot of differences, also share a lot of features such as word order (subject-verb-object, SVO) and a lack of case marking. If word skipping based exclusively on parafoveal information is truly universal, we should also find it in languages with different features such as subject-object-verb (SOV) word order and case marking, such as Turkish. The present study is an attempt to replicate the findings of Angele and Rayner (2013) in Turkish. Since there is no article in Turkish, the number "bir" ("one") and the pronoun "ben" ("I") are used as short and high-frequency targets.

Additionally, it is also not clear how word skipping (or the absence of it) relates to the more general phenomenon of response inhibition and executive function. So far, there is no research on the relationship between skipping and performance on response inhibition tasks. If there is a relationship between the tendency to skip words based on their upcoming visual image and performance on inhibition tasks, this could point to a universal inhibition system underlying both oculomotor and other behavioral responses.

In summary, we hypothesized that if a reader's decision to skip the upcoming word is affected by the visual or lexical familiarity of its parafoveal preview, but not by the syntactic sentence context, an infelicitous high-frequency preview of a short target word should lead to readers skipping the target word more than the correct control preview. Also, if high cognitive control enables readers to take the sentence context into account more strongly compared to low cognitive control, readers who showed a small Simon effect and Flanker effect should skip the target word less often in the high-frequency infelicitous preview condition and more often in the correct control condition compared to readers who showed large Simon and Flanker effects.

Twenty-four Bournemouth University students, native Turkish speakers, with an average age of 25.29 (SD = 1.6) years, participated in the experiment. Each participant read 248 sentences, one-third of which were "ben", one-third were "bir", and one-third were the identical preview target word. 3-level preview condition counterbalanced by a Latin square. For the inhibition task, the Flanker and Simon task has been used.

A linear mixed model was used in the analysis and due to singularity issues, only intercept for the subject could be added to the model as a random effect. As a result, only the preview benefit effect was detected in the first fixation duration, gaze duration, and go-past time on the target (contrast between identical and different conditions). Similarly, there was a significant difference between identical and different preview conditions on N -1 and N+1, which can be interpreted as the parafovea-on-fovea effect and spillover effect respectively. However, no significant skipping effects on N-1, N, and N+1 were observed. Finally, no significant main effect of performance on the cognitive control tasks or interaction between preview and cognitive control task performance was observed.

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Appendix

Table 1. Eye movement measures for the pre-target character, the target character, and the post-target character under three preview conditions.

Preview condition	SP (%)	FFD (ms)	SFD (ms)	GD (ms)	Go-Past (ms)
<i>Pre-target word</i>					
Identical	24.9 (43)	220 (68)	224 (68)	258 (110)	289 (180)
Ben	26 (44)	217 (64)	221 (63)	261 (112)	286 (145)
Bir	24.5 (43)	221 (68)	224 (69)	251 (112)	275 (142)
<i>Target word</i>					
Identical	52.2 (50)	211 (60)	211 (60)	211 (69)	248 (168)
Ben	53.6 (50)	230 (74)	230 (75)	230 (85)	275 (158)
Bir	55.4 (50)	228 (75)	228 (77)	228 (84)	271 (164)
<i>Post-target word</i>					
Identical	14.3 (35)	220 (69)	224 (70)	271 (123)	300 (194)
Ben	14.5 (35)	232 (79)	237 (84)	296 (140)	372 (247)
Bir	13.1 (34)	237 (81)	238 (83)	307 (149)	384 (254)

Note: Standard deviations are provided in parentheses. SP = skipping probability; FFD = first-fixation duration; SFD = single-fixation duration; GD = gaze duration.

Verb aspect processing in monolingual and bilingual heritage speakers of Turkish

Introduction Little is known about the incremental nature of sub-word level processing. In two recent eye-tracking studies, Minor *et al.* [1, 2] have shown that monolingual speakers of English, Russian and Spanish process aspectual information on the sub-word level incrementally. Participants in their studies showed preferential looking to pictures of completed events in the perfective condition and to incomplete events in the imperfective condition.

This study can be seen as a conceptual replication of Minor *et al.* [1, 2]. We examine the processing of aspect in Turkish, focusing on both monolingual speakers in Turkey and bilingual Turkish heritage speakers in Germany. The primary objective of the study is to explore whether Turkish speakers show distinct preferences for representations of ongoing events in the imperfective aspect and completed events in the perfective aspect too. In addition, we ask whether this distinction will be recognized by heritage speakers of Turkish who have shown reduced sensitivity to TAM-morphology in previous studies [3, 4]. To answer these questions, we conducted a picture selection task and Visual World eye-tracking using the same design as Minor *et al.* [1, 2]. We additionally included language proficiency using C-tests and measured working memory as predictors for the underlying individual variation that we expect to see in incremental aspect processing.

Hypotheses We expect a substantial difference in how aspect is processed in Turkish. Participants will favor perfective aspect for completed events whereas imperfective aspect will be preferred for ongoing events. Additionally, since German, the majority language of the Turkish heritage speakers, does not encode grammatical aspect, we anticipate that Turkish heritage speakers will show a reduced effect in comparison to monolinguals. We also believe that working memory and proficiency levels will be able to predict whether or not participants process aspectual information on the sub-word level incrementally.

Methods We designed and recorded the study using Tobii Pro Lab and a Tobii Pro Fusion 120hz. During the study, participants see images of completed events and ongoing events side by side. There are 24 critical stimuli sentences in two conditions (Perfective and Imperfective, in total 48 items), and 20 unrelated fillers. Each participant hears 44 items across different lists. After listening to a stimuli sentence, participants were asked to select the image that corresponds to the sentence (based on imperfective or perfective aspect). We aim to recruit at least 60 monolingual and 60 bilingual heritage speakers in the upcoming months.

Results So far, we only report descriptive results from a sample of 15 monolingual Turkish speakers who participated in a webcam-based pilot version of the experiment in PCIbex [5]. As presented in Figure 1, between 500 and 1000 milliseconds after the offset of the verb, visual distinctions between looks in the imperfect and perfect aspect condition arise.

Discussion This study has the potential to broaden our understanding of sub-word level sentence processing beyond the Indo-European language context, especially focusing on an underresearched population like bilingual heritage speakers.

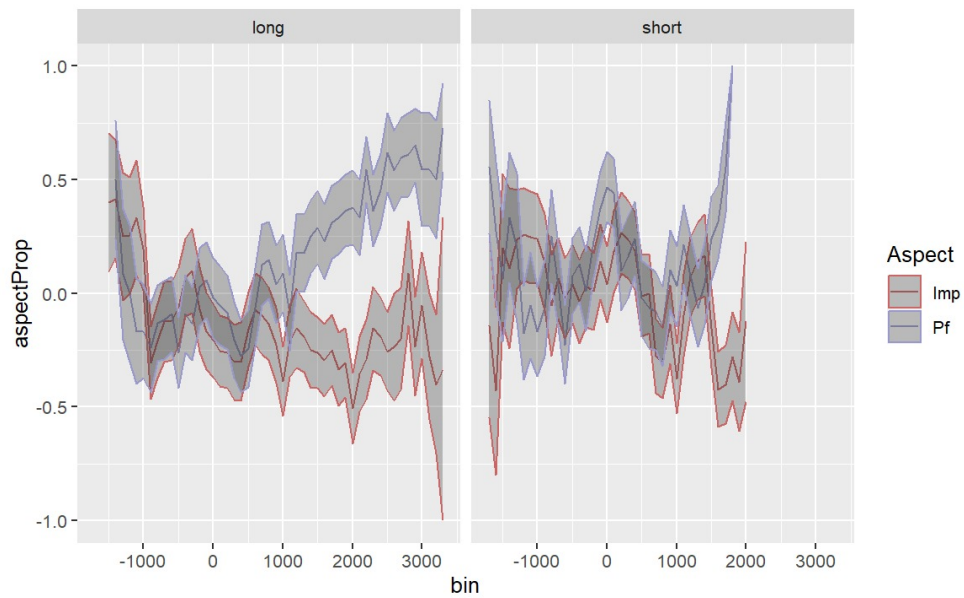


Figure 1: This figure shows the time-course graph for the aspectProp variable which encodes mean looks to the picture with an imcompleted event as -1 and a completed event as 1. The subplots “long” and “short” are split by the two types of critical items that were used in the pilot to determine item length. The short items include a short noun phrase as the object of the sentence. The long items include a longer modified version of the object noun phrase.

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Submission to WoW conference

Title: Learning to Read Connections - Sensitivity to Collocation Frequency and its Relation to Vocabulary Size and Reading Comprehension

The collocation frequency of words in the language environment contributes to early vocabulary development. Vocabulary size, in turn, predicts children's reading comprehension skills later in development. Both collocation frequency and reading comprehension have been connected to inferential reasoning at different time points in development. Here, it was hypothesized that 8-year-old children's (N = 147; 76 female) sensitivity to collocation frequency would be related to vocabulary size and reading comprehension skills of varying complexity.

Participants completed an auditory thematic judgment task to assess their sensitivity to collocation frequency (response accuracy or speed). In the task children were presented with a short sentence containing a reference word (e.g., "John sees the cloud.") and asked to judge which of two subsequent words best fit the sentence (e.g., "rain" or "lip"). Semantic relatedness between reference words and test words was based on a corpus-based analysis of collocation frequency.

Multilevel and mediation analyses confirmed that thematic judgment responses were related to corpus-based measures of collocation frequency measures and were associated with vocabulary size and reading comprehension skills at the sentence and text level. Furthermore, thematic judgment predicted vocabulary size and reading comprehension when the relation of decoding and reading comprehension was controlled.

The study highlights sensitivity to collocation frequency as a link between early language comprehension development (in terms of lexical retrieval and inferential reasoning) and reading comprehension in middle childhood. It also integrates theoretical approaches from computational network analysis and behavioral experimental studies.

Cross-linguistic differences in recognition memory: Encoding of event roles in Japanese and English

The current study intends to deepen our understanding of language and thought interface by comparing the recognition memory of event roles between Japanese and English speakers.

Previous research has shown that Japanese prioritises animacy over agency when choosing the subject of a sentence, with human entities being more likely to be chosen as the subject of sentences in Japanese than in English (Qu & Miwa, 2023).

However, it remains unknown whether the different linguistic encodings of event roles affect how event roles are memorised between speakers of different languages. To address this question, we prepared 200 images as the materials, with 50 images in each of four different types of action chains involving agents and patients: (1) animals chasing humans (2) humans chasing animals, (3) humans throwing objects, and (4) disasters threatening humans. Native speakers of Japanese and native speakers of English participated in an image memorisation experiment, where two images were presented sequentially. Participants were asked to judge whether the second image is the same with the first one.

We were interested in the response accuracies of two groups of participants in Agent-unmatched (the agent was replaced) and Patient-Unmatched (the patient was replaced) conditions. The result showed that Japanese participants were significantly more accurate in memorising human entities than English participants both when human entities were agents and patients. In contrast, English participants paid more attention to agents, so they were more accurate in memorising non-human agents than Japanese participants (See Figure 1).

In conclusion, our findings suggest that the cognitive processes of event roles are influenced by the linguistic encodings of event roles, which questions the previous finding that event role hierarchies are similar across different languages, despite the different linguistic encodings (Ünal et al., 2021).

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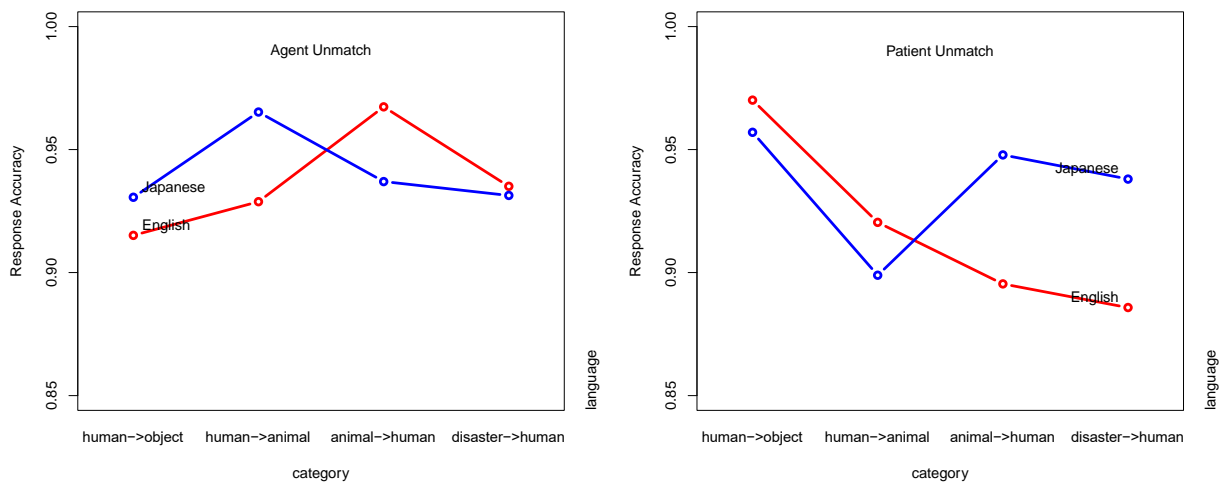


Figure 1. Effects of category on response accuracy modulated by language under Agent-unmatched and Patient-Unmatched conditions

The Emotional Impact of Lexical Arousal on Foreign Language Vocabulary Learning

Abstract

Emotion, as an indispensable psychological aspect of learning experiences, constitutes a central area of inquiry in applied psycholinguistics. Psycholinguists have recently debated the potential impact of emotional factors on the acquisition of language skills. The present study aimed to investigate whether the emotional arousal dimension, which refers to the level of excitement associated with a word, could improve students' success in learning foreign language vocabulary. Forty-one Persian-speaking intermediate students participated in twelve training sessions focused on learning low-frequency English words with varying levels of emotional arousal. Based on these lexical characteristics, we randomly selected a total of 324 English words from the VAD lexicon (Mohammad, 2018) as stimuli. The words were taught to participants using a task-based instructional approach, which aimed to enhance the authenticity of the learning experience. One week after the final session, participants were asked to complete a free recall task, which was administered again a month later. The recall responses were analyzed using generalized mixed-effects regression models. The post-test analysis did not reveal any significant effect of arousal value. However, the delayed post-test results demonstrated a significant impact of arousal value on learners' word recall. Results indicated that participants demonstrated better recall for low-arousal words compared to high-arousal words. Furthermore, a statistically significant difference was observed between the scores of the post-test ($M=59.61$, $SD=31.68$) and the delayed post-test ($M=38.41$, $SD=13.84$), $t(40) = 6.106$, $p < 0.0001$ (two-tailed). These findings provide evidence of the long-term influence of emotional factors on foreign language acquisition. The emotional arousal of words should be taken into consideration by language teachers and textbook designers in order to make informed decisions when selecting words for educational purposes.

The influence of word Frequency, length, and morphological structure on a lexical decision task

Several factors influence morphological processing. The most commonly mentioned factor is word frequency, but length is also frequently considered. The morphological structure of the word is often disregarded, since this information is not easily accessible. However, there are compelling reasons to believe that morphological complexity and word knowledge are also important factors (XXX & XXX, 20XX).

These conclusions were drawn from an offline word association test (WAT): participants read a stimulus word on a screen and were asked to write the first word that came to mind. Simplex and complex words yielded different results: the former predominantly elicited semantically related responses to the stimulus, while the latter revealed a significantly larger number of answers that were morphologically related to the stimulus - they share the same root. The corpus tested consisted of verbs and action nouns derived from those verbs, ranging from 2 to 6 syllables. All nouns were complex words, while the verb set included both simplex and complex words.

The results were intriguing enough to prompt us to replicate the WAT with a larger linguistic set of words, and complement it with a lexical decision test. The new corpus comprises 151 verbs and 151 action noun derivatives in *-ção* (a total of 302 words). All these words were matched for word frequency (low, medium, and high), and word length (verbs of 2 to 6 syllables; nouns of 3 to 7 syllables). The subject sample consisted of 41 adults (neurotypical native European Portuguese speakers with a mean age of 19,95 years (sd=2,56)).

In this presentation, we will discuss the results of the lexical decision test. The results showed that the mean reaction time (MRT) for verbs and derived nouns contrast significantly: in general, verbs are processed faster than nouns ($t=1,803$; $p=0,027$). We have also identified notable MRT distinctions contingent upon the structural attributes of verbs. Specifically, we observed a statistically significant difference between simplex verbs and derived verbs ($t=-2.167$; $p= 0.015$), with derived verbs entailing comparatively greater cognitive processing costs. A parallel pattern emerged in the context of complex action noun derivatives: those originating from simplex verbs significantly contrasted with those originating from derived verbs ($t = -5.562$, $p < 0.001$). In terms of syllabic structure, no notable MRT distinctions were found in verbs. Significant variation was, however, found between 3, 4, and 5-syllable nouns, compared to those comprising 6 and 7 syllables ($Z = 22.586$; $p < 0.001$). When scrutinizing the frequency parameters, in the case of verbs, marked disparities were evident across the categories of low, medium, and high frequencies ($Z = 45.295$; $p < 0.001$). Conversely, when delving into complex derived words, discernible contrasts were limited to the two domains: low and medium frequencies ($t = 9.673$; $p < 0.001$), and low and high frequencies ($t = 3.261$; $p < 0.001$).

In summary, the results of the present study confirm that word frequency, word length and word complexity influence morphological visual word processing. The findings of the present study have important implications for research and practice, suggesting that word complexity should be considered as an essential factor, alongside frequency and length. Future work includes the analysis of the results of the second online task, which is a priming test.

WHERE THE U-SHAPE GONE? POST COVID CHANGE IN THE RELATIONSHIP OF EMOTIONAL VALENCE AND AROUSAL OF WORDS

A few studies explored the influence of situational factors on the Emotional valence (EV) and Arousal (A) of words. Dellatorre et al. (2019) showed that participants were less aroused by positively valenced words under suspense, while Plahchuelo et al. (2020) recorded lower A estimates during the COVID-19 lockdown. To test the influence of the COVID-19 pandemic, we compared the EV and A estimates of Serbian words collected during 2018 (the 1st point) with the new ratings collected at the beginning of the pandemic in 2020 (the 2nd point) and in the summer of 2022 (the 3rd point).

In the 1st and 2nd measurements, participants were different groups of psychology students (N1=40, N2=42; Mage= 19, ~90% women); in the 3rd measurement, participants were accessed via social networks (N3=100; Mage=41.7±8, 86% women). The number of words presented to participants varied across three data collection waves (N1=2100, N2=802, N3=882). For EV, extremes of the bipolar scale represented negative (1) and positive (7) words. A was rated on a unipolar scale (low extreme represented words low in A).

The EV and A estimates from the 2nd and 3rd waves showed high correlations with those collected during 2018 (the 1st and 2nd wave correlations: $r_{EV(800)}=.93; .90, p<.001$; $r_A(800)=.76;.70, p<.001$). A new finding concerns a relationship between EV and A estimates usually described via a quadratic or U-function. Such a relationship was recorded in the 1st wave ($r(800)=-.29, p<.001$) but not during the 2nd and 3rd waves. The relationship became nearly linear ($r=-.55, p<.001$) in the 2nd wave and perfectly linear in the 3rd ($r=-.77, p<.001$), indicating that participants became more aroused by negative and less by positive words (Figure 1). Since the linearity persisted after the pandemic, we hypothesized that people still feel that situational circumstances are unfavorable, especially considering the Ukrainian situation that began in the spring of 2022.

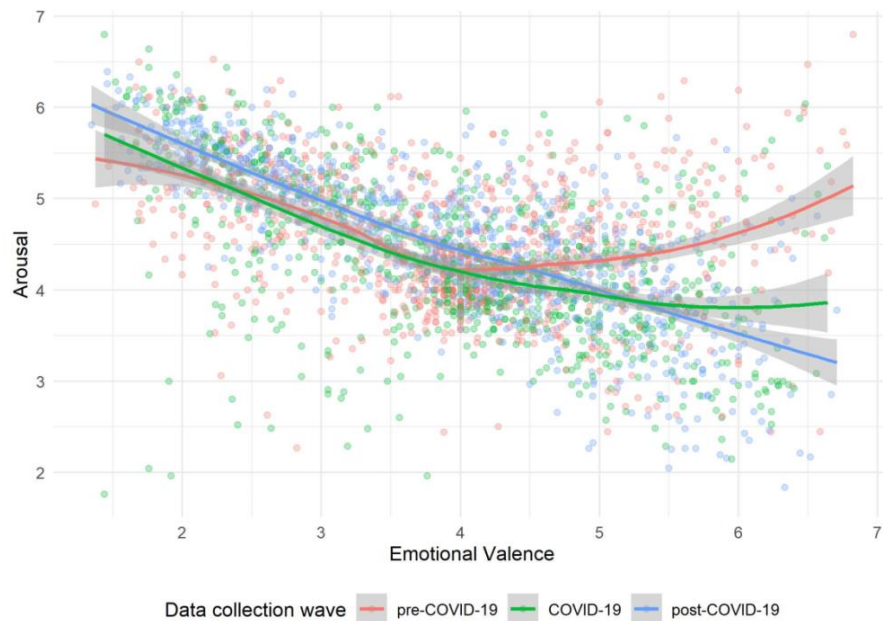


Figure 1. *The relationship between Emotional valence and Arousal across the three data collection time points*

Keywords: emotional valence, arousal, COVID-19, ratings, correlation

Literature

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Demonstratives, deixis, and relationality: the cognitive pragmatics of *augment-ing*

Abstract

The deictic interpretation of demonstratives rests both on their structural composition as well as the context of usage. The former is especially significant vis-à-vis the Germanic and Romance languages which employ adverbial contrastive markers for the deictic interpretation (cf. the demonstrative reinforcer constructions as discussed in Bernstein, 1997 and Roehrs, 2010 among others), distinguishing them from the definite article. Bangla (or Bengali) arguably has a three-way deictic system and uses three demonstrative roots, viz. the proximal *e*, the distal *o*, and the remote deictic *fe*, and their augmented counterparts, *ei*, *oi*, *fei*. Given that the unaugmented roots in Bangla are already marked for distance and therefore perfectly capable of functioning as deictics without requiring any additional contrastive marker, what role does the augment ‘-i’ play in the Bangla demonstrative system, and therefore, what are its characteristics? This is the central question that this paper tries to address, arguing that contrary to a general tendency among speakers towards using them interchangeably, the augmented (*ei*, *oi*, *fei*) and unaugmented (*e*, *o*, *fe*) sets are *not* interchangeable from a pragmatic point of view. I show that though unlike the Germanic and Romance languages, the presence or absence of the *-i* does not make any syntactic difference (as in \pm deictic or \pm definite), it is *not* a semantically null element. Evidence is presented from two different kinds of experiential contexts based on native speakers’ acceptability judgments: (i) where the use of one or the other forms is clearly restricted and any violation thereof would render the resulting structures unacceptable or infelicitous; and (ii) the ‘seemingly’ more flexible/ unrestricted contexts of usage, where there is no structural constraint involved in using the unaugmented for the augmented forms and vice versa. Drawing on the former, I propose that in case of the latter, the undistinguished usage is affected not by a contrastive but a *perceptual* difference among speakers which alters the overall pragmatic interpretation, since visual and perceptual priming affects the choice of usage of structural alternatives (Tomlin & Myachykov, 2015). Consequently, variations in the use of one or the other forms are observed among individuals/speakers. This is explained in the light of the *relational approach* to demonstrative reference outlined in Hanks (1990), arguing that there exists a privative opposition between the augmented and unaugmented demonstratives in Bangla, thereby attempting to trace the features of what has been called the ‘augment’ in literature (Dasgupta, 1992) and (re)defining it as a *deictic reinforcer*.

Keywords: demonstrative, deixis, augment, deictic reinforcer, relationality

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Psycholinguistic Determinants of Timed Object Naming in Thai

We report object naming latencies in Thai for a subset of photographic images from the Bank of Standardized Stimuli (BOSS; Brodeur, Dionne-Dostie, Montreuil, & Lepage, 2010). Thirty-two participants from Chulalongkorn University, Thailand, performed a speeded object naming task on 332 high quality colour photographs of common objects that had been previously standardised for Thai speakers on a number of psycholinguistic dimensions known to influence lexical access and other cognitive processes (Clarke & Ludington, 2018). We assessed the contribution of eight predictor variables on object naming latencies using multiple regression analysis and found independent effects for name agreement, image agreement, category agreement, age of acquisition, word frequency, and object familiarity. Jointly these variables accounted for just under 50% of the overall object naming variance.

Variables such as name agreement, image agreement, age of acquisition, and word frequency routinely affect object-naming performance in languages such as French, Spanish, Persian, and English (e.g., Alario et al., 2004; Bakhtiar et al., 2013; Cuetos et al., 1999; Snodgrass & Yuditsky, 1996). While the current findings reveal that the same psycholinguistic properties are predictive of object naming in Thai, they extend previous work by incorporating a larger number of predictor variables and by utilising more ecologically-valid stimuli than have been used previously (e.g., Snodgrass & Vanderwart, 1980). We interpret these findings in relation to current models of lexical access and picture naming, which posit that several distinct processing stages are selectively influenced by specific psycholinguistic variables during speech production. Our findings support the use of the BOSS as both a valid and ecological alternative image database for investigating language processing, especially, but not exclusively, for Thai-speaking populations.

ANTHROPOMORPHIC PROPERTIES OF LANGUAGE CONSCIOUSNESS

Ekaterina Redkozubova, PhD
Southern Federal University, Russia

As a type of worldview, anthropomorphism is one of the most fundamental properties of human thinking in the terms of categorization and conceptualization of the objective reality. It is a linguistic universal in which the features of one's own body, state of mind and emotions are correlated with surrounding objects and phenomena. To the same extent, a person can assume the properties of those objects that he is trying to comprehend.

In our opinion, anthropomorphism is an umbrella term in relation to such adjacent and overlapping phenomena of secondary nomination as animism, animatism, personification, hylozoism. We will highlight the following as the most important anthropomorphic features:

- it is the leading vector of knowledge profiling, the angle from which individuals look at the world around them;
- anthropomorphism is a mental and linguistic universal and is characteristic of a person regardless of their linguistic, racial, political-economic or any other affiliation;
- it is quite justified logically and has deep archetypal ancestral features, reflecting the course of history and culture, political and economic impacts, the result of social phenomena of its society;
- anthropomorphism of thinking is characteristic of a person since he begins to realize himself as a person and is especially pronounced in childhood, affecting the systemic properties of thinking as a tool for "taming" natural objects and phenomena.

Eye-movement patterns during paragraph reading in adolescents with different reading-related skills

Adolescence, being a transitional period from childhood to adulthood, presents a critical stage in reading development. Adolescents are mastering how to rapidly form a so-called “situation model of text” and integrate new words as they read to build a rich representation of the text which is beyond what is stated explicitly (Kintsch, 1998).

A huge part of eye-movement research focuses on words and sentences. Paragraphs, on the other hand, provide more ecological stimuli, enabling the evaluation of reading strategies and overall reading behavior. Furthermore, in the recent decade, new methods for analyzing eye movement parameters emerged. One example is the scanpath analysis. It has significant advantages over the analysis of average parameters of fixation and saccade per each area of interest because it allows capturing the overall strategy during reading and clustering readers (von der Malsburg et al., 2015). In the current study, we aim to identify reading patterns characteristic of skilled and less skilled adolescent readers using the scanpath analysis.

Here, we present the preliminary results of an ongoing study. To date, the data from 112 adolescents aged from 11 to 18 years are available. The sample consisted of the participants with different reading comprehension abilities who were divided into two groups (low- (n=58) and high-performing (n=54) readers) depending on the Reading comprehension task score. To form the two groups of low- and high-performing readers, we used an extreme phenotype design. We developed a naturalistic reading experimental paradigm using the Experiment Builder software. The reading materials contained six expository paragraphs. After each paragraph, the participants completed a recall, and true-false test after all paragraphs reading (n=96 words for recall, n=60 sentences for true-false task). During the whole experiment, we recorded eye movements with an EyeLink 1000 desktop eye-tracker (SR Research) with a sampling rate of 1000 Hz.

At this stage, we analyzed the data on true-false task that participants performed after reading the paragraphs. In the group with low reading comprehension skills, there was a change in the duration of fixations for students from grade 6 to 11, while no such changes were observed in the group with high reading comprehension skills. The same was observed for the word viewing duration. There were no differences in the number of fixations to the area of interest and the number of regressions to the area of interest. Currently, the research team is at the stage of analyzing the data on paragraphs. We expect to see the differences in eye-movement activity between high and low performing adolescent readers. First, we expect differences in reading patterns, specifically, more regressions in the low-performing group. Moreover, we assume that paragraphs processing time will be longer in the low-performing group because of rereading within a sentence or returning to the previous sentence. We also expect that average characteristics of saccade and fixation per each area of interest will be greater in the low-performing reading group. Secondly, cluster analysis by the type of scans will allow us to distinguish clusters in groups with highly and lowly developed reading skills. Having data on the subtests will allow defining reading sub-skills that contribute to reading comprehension in each group.

Overall, our results contribute to a more in-depth understanding of reading patterns as opposed to discrete components of these patterns.

Exploring the limits of language non-selectivity: How do multilinguals process non-native cognates and interlingual homographs?

According to the language non-selective hypothesis, multilinguals activate lexical representations from all languages that they know when reading in one language (Dijkstra et al., 1998). This hypothesis is supported by the commonly reported (1) shorter response times to cognates (e.g., the Dutch-English word “winter”, which has the same meaning in both languages) and (2) longer response times to interlingual homographs (e.g., the Dutch-English “map”, which means “folder” in Dutch) compared to monolingual control words.

However, many studies that yield such cognate and/or interlingual homograph effects only comprise L1-L2 (or L1-L2-L3) cognates and interlingual homographs. These interlingual words may inherently present a confounding variable, as the L1 is hypothesized to be qualitatively different from languages learned later in life (e.g., Gor et al., 2021; Qiao & Forster, 2017; Zhao & Li, 2010) and “L1 cognates [may] acquire a special status in L2 language learners because of the key role they play in L2 vocabulary acquisition” (Midgley et al., 2011). To eliminate any potential effect of this supposed “special status” of the L1, we also include cognates and interlingual homographs that do not exist in the L1 (i.e., L2-L3 items).

In our lexical decision tasks with isolated words, native Dutch speakers respond to Dutch-English (L1-L2) and English-French (L2-L3) cognates (Exp. 1) and interlingual homographs (Exp. 2) and English (L2) controls. We want to investigate whether L2-L3 items yield similar effects as L1-L2 items. The processing of all interlingual items is compared to that of pure English words whose form map onto similar or dissimilar meanings. For cognates the comparison involves L2 metonyms and synecdoches (e.g., “mouth” in “another mouth to feed”). For interlingual homographs the comparison involves L2 ambiguous words (e.g., “bat”, which can denote both a nocturnal flying animal and a baseball bat). If lexical access is truly language non-selective, similar results should be obtained (1) for cognates and L2 metonyms and (2) for interlingual homographs and L2 ambiguous words.

Since language users generally encounter words in a meaningful sentence context, the same stimuli will subsequently be presented in high-constraint (Exps 3 and 4) and low-constraint (Exps 5 and 6) sentence contexts using the cross-modal priming paradigm. This will demonstrate to what extent semantic constraint can inhibit the activation of languages that are irrelevant in a pure (L2) language context that closely resembles how we process language in our daily lives.

We are currently in the process of conducting Experiments 1 and 2. These experiments will be finalized at the end of October 2023. Therefore, we would like to present the results of these experiments at the Virtual Words in the World International Conference 2023. In an earlier experiment (Anonymous author of this abstract, 2019) with the same cognate types as described above (L1-L2 and L2-L3), we obtained cognate facilitation effects for both Dutch-English and English-French cognates in a population with an overall lower proficiency in French (the L3) than our current population. Hence, we expect to find similar cognate effects in our current experiments. We will also report whether inhibition effects occur for both L1-L2 and L2-L3 interlingual homographs. Our comprehensive approach will provide more insight into the limits of language non-selectivity: are the commonly reported cognate and interlingual homograph effects (partially) an effect of a “special status” of the L1 and does an everyday, meaningful sentence context eliminate effects for interlingual words altogether?

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One form, two meanings? The semantics of generic and specific role nouns in German

According to grammarians, generic masculines in German are gender-neutral in their meaning (cf. Doleschal, 2002). As an example, take the grammatically masculine role noun *Musiker* ‘musician’, which can be used as specific role noun, i.e. to refer to a male musician, or as generic role noun, i.e. to refer to a musician of any gender. Psycholinguistic research of the last decades, however, showed that generically used role nouns are not comprehended as gender-neutral but instead as biased towards male referents (e.g. Gygax et al., 2008; Schunack & Binanzer, 2022). Recently, Schmitz (2023) and Schmitz et al. (2023) added similar findings by way of computational methods. The aim of the present paper is to show that Schmitz et al.’s computational implementations come with noteworthy issues and to offer a computational alternative.

Schmitz (2023) and Schmitz et al. (2023) computed semantic vectors for German role nouns using naive discriminative learning (e.g. Baayen et al., 2011). While this approach is well-grounded in psychological research, the way Schmitz et al. implemented it led to a strong association of the semantics of ‘generic’ and the grammatical masculine, rendering a strong semantic connection between ‘generic’ and masculine forms as little surprising. Further, genericity was treated as a type of inflectional feature, even though it is not.

To circumvent these issues, the present paper proposes the use of instance vectors (Lapesa et al., 2018). Instance vectors are vector representations for individual instances of words rather than of lemmas. For their computation, a window of n preceding and following context words around a given target word is considered. The pertinent instance vector is the average of these n context words. Using instance vectors, no genericity vector is computed and, thus, genericity is neither correlated to other vectors nor treated as inflectional function.

Instance vectors were computed for 3,020 target word attestations based on 75 target words and their corpus attestations from Schmitz (2023). New attestations were sampled from the Leipzig Corpora Collection’s “news” sub-corpus (Goldhahn et al., 2012) where fewer than 10 attestations were contained in the corpus by Schmitz (2023). Instance vectors were computed with $n = 2$, $n = 5$, and $n = 8$ to see whether the amount of context included made a notable semantic difference. Finally, like in Schmitz (2023), the resulting semantic vectors were compared using cosine similarity, a measure regularly used to compare vector similarity. Cosine similarities were computed within a target word for the following comparisons: generic masculine vs. specific masculine; generic masculine vs. specific feminine; specific masculine vs. specific feminine.

Introducing beta regression in generalised additive mixed models using the *mgcv* package (Wood, 2017) in R (R Core Team, 2021), it was tested whether cosine similarity was significantly different for the three comparisons. Number, stereotypicality, word-form frequency, and overall frequency were included as control variables.

The results show that the generic masculine was semantically more similar to the specific masculine than to the specific feminine across all window sizes. The highest degree of similarity was found for the generic masculine and the specific masculine. Depending on window size, the least similar forms are either the generic masculine and the specific feminine ($n = 2$, $n = 5$) or the specific masculine and the specific feminine ($n = 8$).

The findings of the present study are in line with a large body of previous psycholinguistic research on the semantic nature of the generic masculine in German, and, regardless of the aforementioned issues, support the findings by Schmitz (2023) and Schmitz et al. (2023). The implications of the present study are twofold. First, the masculine bias in generic masculines in German is stable across a variety of linguistic methods. Second, computational methods seem to be a meaningful complement to psycholinguistic approaches in research on semantic genericity and gender-neutrality.

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Examining the electrophysiological signature of interletter spacing on visual word recognition: An ERP study

Previous behavioral studies have shown that interletter spacing is a perceptual factor that affects visual word recognition and reading (1). While condensed spacing may hinder the early stages of letter encoding by enhancing crowding effects (e.g., window) (2,3), expanded interletter spacing (e.g., window) would instead improve letter encoding relative to the default spacing (4, 5). To examine the electrophysiological signature of interletter spacing on visual word recognition, we designed an Event-Related Potentials (ERPs) go/no-go semantic categorization task (120 [no-go] non-animal words and 18 [go] animal words), in which the focus was on “no-go” responses. Words were presented with three different interletter spacings: standard (0) (e.g., window), condensed (-1.5 pt) (e.g., window), or expanded (+1.5 pt) (e.g., window). We were interested in a key ERP component, the N170, sensitive to crowding effects and associated with the early encoding of orthographic information (6). If interletter spacing affects, via crowding effects, the early encoding of letters within words, we expect a linear relation between interletter spacing and N170 amplitude (N170 negative voltage values: condensed > standard > expanded). The ERP results showed that condensed spacing elicited higher negative voltage values than both the standard and expanded spacing conditions in the N170 component (160 - 300 ms post-stimulus; occipital), thus confirming the difficulty of orthographic processing with increased crowding. Notably, no differences were observed between standard and expanded spacing in this component, suggesting a critical interletter spacing beyond which crowding does not harm letter encoding during word recognition.

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Poster Session 4 – Saturday Afternoon

01. When things go missing: Referent absence in noun cross situational word learning	Christine S Yue (University of Pennsylvania)*; Sandy LaTourrette (Haverford College); Charles Yang (University of Pennsylvania); John Trueswell (University of Pennsylvania)
02. Eye Tracking of Bilingual Irony Processing: Compliments versus Criticisms	Vegas Hodgins (McGill University)*; Mehrgol Tiv (US Census Bureau); Chaimaa El Mouslih (McGill University); karla s Tarin (McGill University); ANTONIO INIESTA (McGill University); Debra Titone (McGill University)
03. Modelling Mandarin Loanword Adaptation of English Null-Onset Personal Names	Rasmit Devkota (Georgia Institute of Technology)*
04. Words in Second-Language Speech Accommodation in Interactive Conversational Settings	Ana Bueno (Gordon College); Joshua Faircloth (Gordon College); Erica Kushner (Gordon College); Christiane Noriega (Gordon College); Charlotte Charek (Gordon College); Bernard Ocansey (Gordon College); Stephanie Onwe (Gordon College); Kathrin Rothermich (East Carolina University); Susan C Bobb (Gordon College)*
05. Abstract and concrete word-learning from context in children	Allison Granger (The Ohio State University)*; Layla Unger (The Ohio State University); Vladimir Sloutsky (The Ohio State University)
06. Impact of Language attitudes on Self-Evaluative judgements of Language Experience	Esteban Hernandez-Rivera (McGill University)*; Alessia Kalogeris (McGill University); Mehrgol Tiv (McGill University); Debra Titone (McGill University)
07. Dresses and ties: the effect of grammatical gender and semantic bias on object concepts	Noelia A Stetie (Universidad de Buenos Aires / CONICET)*; Míriam Aguilar (Universidad Complutense de Madrid); Camila Martínez Rebolledo (Pontificia Universidad Católica de Chile); José Antonio Hinojosa (Universidad Complutense de Madrid); Gabriela Zunino (Universidad de Buenos Aires / CONICET)
08. The role of morphology in novel word learning: A Registered Report	Olga Solaja (SISSA)*; Davide Crepaldi (SISSA)
09. Axiologic Conceptualization Of Violence In Media Discourse	Vadym O Shevchenko (Kharkiv University of Humanities «People’s Ukrainian Academy»)*; Iryna Zmiiova (Kharkiv University of Humanities «People’s Ukrainian Academy»)
10. Script mixing in social media: processing costs with potential benefits	Janessa Tam (University of Toronto Scarborough); Philip Monahan (University of Toronto Scarborough); Rena Helms-Park (University of Toronto Scarborough)*
11. Politics and personality modulates processing of singular-‘they’ pronouns: Evidence from self-paced reading and acceptability ratings	Hannah Lam (University of Alberta)*; Juhani Jarvikivi (University of Alberta)

12. How does math-specific language experience impact word problem-solving in bilingual adults?	karla s Tarin (McGill University)*; Esteban Hernandez-Rivera (McGill University); dan chen (McGill University); Michelle Jang (McGill University); gigi luk (McGill University); Debra Titone (McGill University)
13. Attraction Effects in the Processing of Long-distance Chinese Classifiers: An eye-tracking study	Xiaoyu Liu (University of Oregon)*; Nayoung Kwon (University of Oregon)
14. The Influence of a Password's Linguistic Properties on its Typing Output	Keira Gow (Concordia University of Edmonton); Alex Taikh (Concordia University of Edmonton)*
15. When words collide: Compound recognition via hemifield processing	Cassandra E Didical (Concordia University); Roberto G de Almeida (Concordia University)*
16. Foreign-origin words and their native equivalents in the Turkish Lexicon: An investigation of relative frequencies and semantic relatedness	Christian Agregan (University of Toronto); Yasin Tuna Kurşunlu (University of Toronto); Urjashi Laha (University of Toronto Scarborough)*; Elif Sarı (University of Toronto); Simge Tekgül (University of Toronto); Selçuk Emre Ergüt (University of Toronto); Gözde Mercan (University of Toronto)

When hings go missing: Referent absence in noun cross situational word learning

Background The infant’s task of learning early nouns seems much easier than other “hard” words since these nouns tend to be uttered in the presence of their object referent [1]. However, in naturalistic language, the object referents of words are not always present in the visual scene (e.g. “Remember when we lost your ball?”) [2]. In a novel experiment, we assess adults’ cross-situational word learning (CSWL) performance when a word’s target referent is occasionally absent, either before or after learners have been exposed to the target word-referent mapping. We then ask how well this pattern of performance is captured by two different models of CSWL: a hypothesis-testing model, Memory-Bound Pursuit model (MBP) [3,4], and a global associative model, the Familiarity-Uncertainty based Global model (FUbG) [5]. The results of this experiment have implications for the mechanisms of early word learning.

Models The MBP model is a fundamentally hypothesis-testing model, pursuing only its best hypothesis at each exposure. Across exposures, it can retain multiple hypotheses, first storing these hypotheses in a size-limited *active learning space* (ALS) where learning occurs, then moving word-referent pairs to a size-unlimited *lexicon* when they have been sufficiently supported. Specifically, the model moves a hypothesized referent to the lexicon if that referent can beat out the competitor hypotheses for that word in the ALS. Because of this, the MBP model predicts that learners will recover better from an absent-referent exposure if that trial occurs after the target hypothesis has been moved to the lexicon, rather than before.

In contrast, the FUbG model assumes that learners associate all visible referents with the presented word, but that they selectively attend more to some of the presented word-object pairings, based on familiarity (previously co-occurred) and uncertainty (novel or un-associated stimuli). Whether a referent-absent exposure occurs before or after referent-present exposures does not directly impact the FUbG learner, as it always distributes learning across all the various referents it encounters. However, because the model uses a memory decay parameter to model forgetting, it does predict the additional delay imposed by a referent-absent exposure should negatively impact word learning.

Experimental Design In light of these models and predictions, we investigated the effect of an absent-referent exposure on the establishment of a word-referent mapping.

Adult participants (N=81) participated in a CSWL task. In each trial, they heard a nonce word and selected between four possible referents. The target block featured 4 words with three exposures interleaved. Between participants, we manipulated whether the target object was absent in the first exposure (APP: *Absent-Present-Present*) or the third (and final) exposure (PPA: *Present-Present-Absent*). The object referent a participant selected in the first *Present* trial became the target object, re-appearing in the second *Present* trial.

For all subjects, this target block was preceded by a warm-up word-learning task in which they saw 10 nonce words, to mitigate a primacy effect. The target block was then followed by another word-learning block where they encountered those 10 nonce words again. Finally, participants were tested on all words in a 12-alternative forced-choice task.

Results and Discussion The hypothesis-testing model, MBP, predicts that learners with an established hypothesis recover better from an absent-referent trial (APP performs worse than PPA), while the global model, FUbG, predicts a difference in the other direction. Human performance was in line with MBP: words in the PPA condition were better recalled than words in the APP condition ($\beta=-0.24$, $SE=0.13$, $p=0.056$), as seen in Figure 2. Though the MBP learner outperforms humans in the PPA condition, the effect is in the predicted direction. Moreover, while the MBP-predicted values are a marginally significant positive predictor of performance ($\beta=1.08$, $SE=0.63$, $p=0.085$), the FUbG-predicted values are significantly negatively correlated ($\beta=-6.02$, $SE=3.00$, $p=0.045$). This suggests that human CSWL more likely relies on a hypothesis-testing mechanism.

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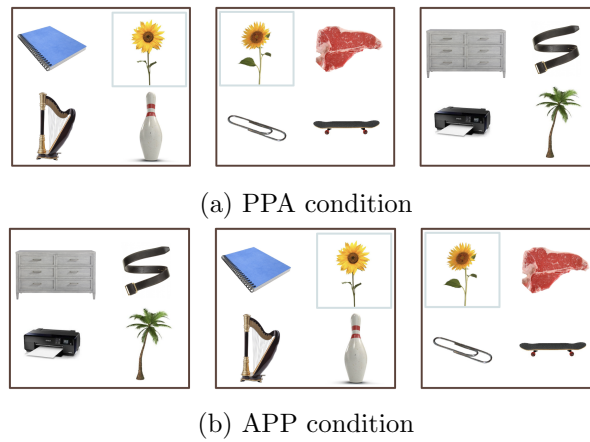


Figure 1: The manipulation places the target-absent trial either in the last trial (PPA, above) or in the first trial (APP, below).

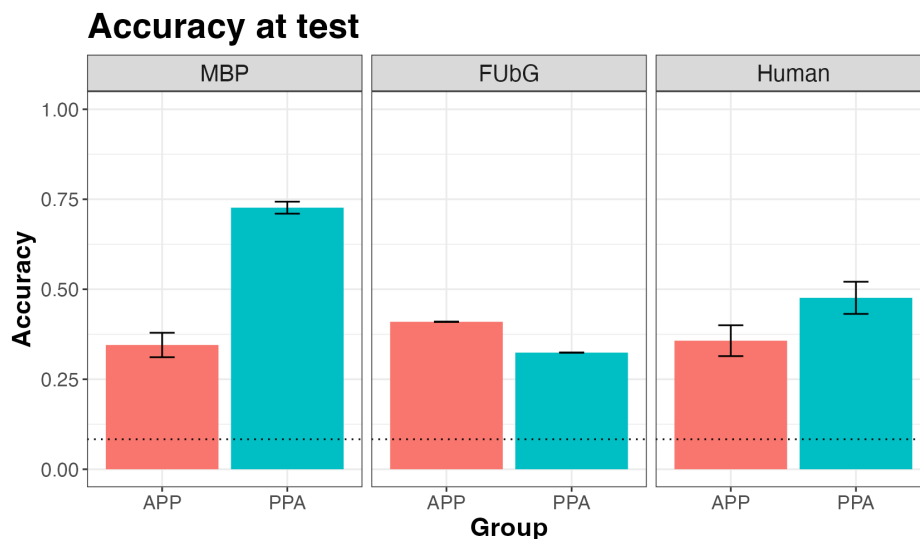


Figure 2: The results: the MBP learner has higher performance on PPA than APP while the FUbG learner has the opposite. Human learners pattern with MBP. Chance level is 0.083, with a 12-alternate forced-choice test.

Words in Second-Language Speech Accommodation in Interactive Conversational Settings

Previous research has shown that people adapt the way they speak depending on the perceived comprehension level of the listener (Communication Accommodation Theory; Ryan, et al., 1994). Second-Language (L2) speech accommodation is characterized by changes in physical speech properties such as decreases in speed and hyperarticulation, as well as changes in lexical properties such as increases in word frequency and contextual diversity (Scarborough et al., 2007). With today's widespread use of digital communication platforms, many interactions no longer occur face to face. However, video or audio mediated conversations may alter the interpersonal dynamics of the interaction by decreasing access to conversational cues such as facial affect or gestures. In the current study, we investigated communicative contexts with and without visual cues. Specifically, we asked "to what degree does L2 accommodation occur in naturalistic situations where participants are strictly limited to auditory communication?".

To address this question, dominant (L1) English speakers took part in a study playing a game with either an L1 or an L2 English speaker. In the first study, players interacted in the same room. In the second study, players interacted over Zoom in different locations with only audio feedback and video turned off. The interactions were analyzed for word frequency, word length, and contextual diversity. We hypothesized that L1 English speakers will adjust speech toward L2 English speakers (Rodriguez-Cuadrado, Baus, & Costa, 2018), and adjustments will increase when there is no visual feedback (Doherty-Sneddon et al., 1997) compared to when speakers do have visual cues.

Findings where both visual and audio interaction occurred suggest lexical differences indicative of speech accommodation. L1 English speakers used significantly more frequent words with L2 speakers than L1 speakers ($F(1,1023) = 7.82, p = .005$). L1 speakers also used significantly more contextually diverse words with L2 speakers than L1 speakers ($F(1,1023) = 12.15, p = .001$). For Word Length, there was no effect of Condition ($F < 1, p = .743$). Analyses for the visual-only condition are ongoing. We will interpret results considering communication accommodation theory and their significance for technologically mediated conversations.

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Eye Tracking of Bilingual Irony Processing: Compliments versus Criticisms

Understanding irony is often more difficult than understanding literal sentences (Olkoniemi & Kaakinen, 2021). This difference is reflected in various eye tracking measures including gaze duration and go-past time, with ironic phrases taking longer to process at both early and late stages than literal phrases (Olkoniemi & Kaakinen, 2021). We can distinguish between two types of irony: ironic compliments, which indicate a negative meaning (e.g., “Good job!” spoken upon a failure), and ironic criticisms, which indicate a positive meaning (e.g., “It’s terrible!” spoken upon a success) (Pexman & Olineck, 2002). Irony processing is one manifestation of the act of mentalizing, our ability to understand the behavior of others by imagining their own mental states (Tiv et al., 2023). Bilingualism is known to impact various social cognitive processes, however, the degree of influence on mentalizing processes such as irony processing still requires investigation.

In the present study, we investigated the effect of irony in written sentences on eye-tracking measures such as first-pass reading time, total gaze duration, and go-past time in bilingual readers. Participants read ironic or literal phrases in the L1 and L2 while eye movements were measured. In a 2x2 design, phrases were additionally manipulated to be either compliments or criticisms, creating a total of 4 possible reading conditions: Ironic criticism, ironic compliment, literal criticism, or literal compliment. Linear mixed effects modelling of data was conducted following Sonderegger, 2023. While data analysis is ongoing, pilot results indicate an interaction between irony/literal status and compliment/criticism status in both early and late reading measures, regardless of whether reading occurs in the L1 or L2. No interaction between irony status and L1/L2 was detected. Though data analysis is still ongoing, these preliminary results suggest that irony processing is equivalent in the L1 and the L2.

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Modeling Mandarin Loanword Adaptation of English Null-Onset Personal Names

[Introduction] English proper nouns, such as personal names, undergo a complex adaptation process when loaned into a tonal language like Mandarin Chinese. Loanword adaptation research has focused on individual phonological adaptation patterns (e.g., stress and tonics^{[1],[2],[4]}) and concepts such as relative importances and optimality^[4]. However, little attention has been given to systematically modeling the loanword adaptation process. The present study performs a corpus analysis of borrowed English null-onset personal names, identifying the factors that contribute most significantly and broadly to the Mandarin loanword adaptation process and modeling it computationally to allow for use in machine translators and natural language processors.

[Dataset] We created a corpus of English null-onset personal names scraped from various open-access source corpora (e.g., US census data, Wiktionary, and popular baby naming websites) and their Mandarin counterparts generated using seven popular English-Mandarin machine translators (Google, Bing, Alibaba, Baidu, Caiyun, Iciba, qqFanyi, Sogou, and Papago). We used the prompt “My name is ...” to direct the translators to generate human names as opposed to other possible interpretations. Phonological features of the English names (e.g., vowel/consonant quality and stresses) and the Mandarin translations (e.g., pronunciation and tones) are extracted using the CMU Pronouncing Dictionary Python interface and Oxford Dictionaries API, excluding those with multiple pronunciations or no data. English names with non-phonological translations in Mandarin were also removed, such as Amber and Oxford. We also calculated frequency and conditional probability statistics on the final dataset for (i) each English Onset pronunciation in International Phonetic Alphabet (IPA) format, (ii) each Mandarin Onset Chinese character (Hanzi), and (iii) each Mandarin onset tone. We also calculated these statistics for subsets of the datasets, such as the frequency of each tone for each English Onset IPA and each Mandarin Onset Hanzi. The final dataset contains 908 English names, their Mandarin translations, and phonological features.

[Model creation] We then performed a train/test split of the dataset with a test proportion of 0.33. We stratified the split by tone, such that the relative proportions of each tone are equal in the training and testing data. For the model, the scikit-learn DecisionTreeClassifier implementation was chosen for its ability to model the translation cognitive process, with Gini criterion optimization, best splitting, and minimum sample criteria (2 minimum for split, 5 minimum for leaf). The model is an ensemble of decision trees (Figure 1) predicting tone (i) directly and (ii) indirectly by predicting the onset Hanzi.

[Results] Through iterative improvement, the model achieved an F_1 score (harmonic mean of the precision and recall) as high as 79% (Table 2). The full model consists of 7 Onset Hanzi trees optimized for 13 Hanzi with around/over 75% precision. Conditional frequencies are used in most decisions, followed by stress and some vowel qualities with feature importances within 1-10%, suggesting that the underlying phonological patterns are captured in the frequency data, also argued by [1] and [3].

[Conclusions and future work] This study introduces a computational model for the adaptation of English null onset personal names into Mandarin, contributing to our knowledge of key factors involved in loanword adaptation and providing valuable insights for enhancing the accuracy of translators and natural language processors adept at capturing perceptual linguistic phenomena. Metrics show that limited presence of 2nd and 3rd tone names (making up only 3% of the dataset) significantly reduce the accuracy. A conjecture to this finding is that there is a perceptual tendency to avoid these tones while borrowing from English, although existing literature has not yet documented such a phenomenon. This work can be significantly improved by thoroughly expanding and evaluating the data and emphasizing phonological features, including distinctive features and known phonology laws. The foundation laid in the current work also makes the model applicable to languages beyond Mandarin Chinese, offering an opportunity to unveil broader insights into loanword adaptation and phonological perception across a multitude of languages.

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[Figures and Tables]

Figure 1: A flowchart of the prediction process using a combination of indirect and direct decision trees

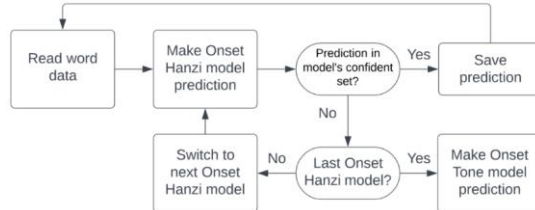


Table 1: Most impactful features for the name “Olivia”

<p>F(Onset): 63 P(Hanzi=奥 Onset): 0.889 P(Hanzi=艾 Onset): 0 P(Hanzi=阿 Onset): 0 P(Hanzi=伊 Onset): 0 P(Hanzi=亚 Onset): 0 P(Hanzi=埃 Onset): 0 P(Hanzi=欧 Onset): 0.0793</p>	<p><i>Note:</i> These are the features that have an individual mean feature importance which is at least one standard deviation above the general mean. <i>F(Onset)</i> refers to the frequency of a given English onset IPA. <i>P(X Y)</i> refers to the probability of characteristic X given Y. We note that the probabilities here do not necessarily add up to 1 since these are only the probabilities that are used by the model in making predictions. Although direct phonological features are also used, their importance falls within a standard deviation above the mean.</p>
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Table 2. Final Model Performance Metrics

Tone	Precision	Recall	F ₁	Support
1	0.77	0.94	0.85	184
2	0.67	0.67	0.67	3
3	0.00	0.00	0.00	7
4	0.84	0.58	0.68	106
<i>Weighted Averages</i>	0.78	0.79	0.79	300

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CROSS-LANGUAGE SIMILARITIES IN JAPANESE VISUAL WORD RECOGNITION: A CHRONOMETRIC STUDY WITH CHINESE-ENGLISH-JAPANESE TRILINGUALS

The big question in bilingual word recognition has been whether or not bilinguals recruit lexical knowledge of two languages automatically when they are using one certain language. It can be more complicated in trilingual word processing as more possibilities could be discussed in a trilingual language combination. Previous studies on trilingual word recognition suggest that all three languages are activated in a language non-selective manner for trilinguals of languages with same scripts. The present study examined whether this language non-selective activation view holds also for distinct-script trilinguals. We addressed this issue by investigating how the cross-language similarities affect word recognition in Chinese-English-Japanese trilinguals. In a lexical decision task, response times were co-determined by Japanese-English phonological similarity, Japanese-Chinese phonological similarity, and word frequency of Chinese translation equivalent, if some phonological similarity shared with its Japanese target word. Limited yet significant cross-language effects were observed in the experiment. We concluded that for distinct-script trilinguals, word knowledge of non-target languages in different writing systems could both be non-selectively used via cross-language similarities even if the word input is restricted to one language.

Keywords: trilingual word processing, cross-language similarities, lexical decision

Abstract and concrete word-learning from context in children

Some words refer to concrete items and can easily be perceived by our senses, like “barn” or “ocean,” whereas others refer to abstract items and cannot be perceived, like “truth” or “reason.” There is a body of prior work providing evidence for a profound “concreteness effect,” in which concrete words are learned earlier in development and remembered better than abstract ones. One possible explanation for this effect is that concrete words can be processed through two systems, one for sensory imagery and one for linguistic information, whereas abstract words are only processed by the linguistic system because they lack sensory referents. Alternatively, concrete words might be learned earlier because children are better able to understand words with concrete meanings. The purpose of the current study is to provide a novel test of why concrete words have a learning advantage over abstract words. Specifically, we leveled the playing field for learning abstract and concrete words so that the only information available for word learning was linguistic contextual information. 7-9 year old children were tasked with learning the meaning of nonsense words, which represented target abstract and concrete nouns, from context, such as in the sentence, “The boy always lies and never tells the girk.” Children were then evaluated on their knowledge of the novel word in a Word-Define phase and a Word-Use phase. In the Word-Define phase, children had to select the meaning of the novel word, and in the Word-Use phase, children had to select the new word that completed a fill-in-the-blank sentence. Results show that children learn concrete words significantly more readily than abstract ones in the Word-Define phase. A similar but non-significant trend was seen in the Word-Use phase. This ability to learn words with concrete meanings, even when only language context is available, may account for the predominance of concrete words in early vocabularies.

Figures

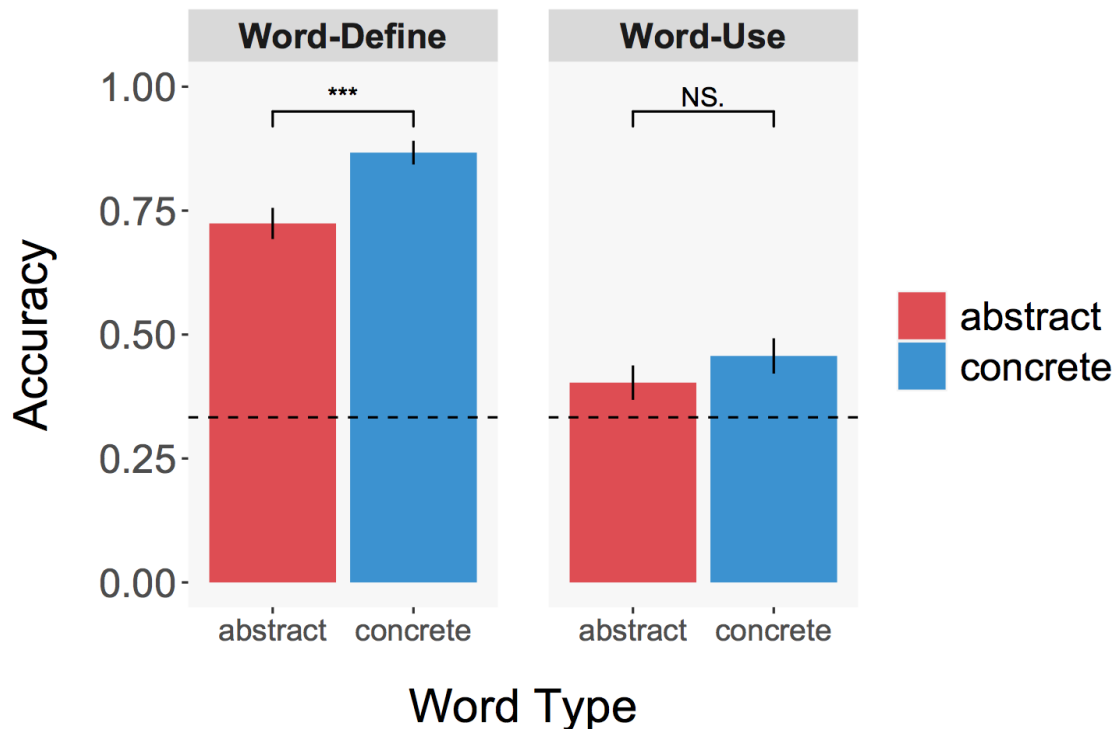


Figure 1. Accuracy of abstract and concrete tests of word knowledge

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Impact of Language attitudes on Self-Evaluative judgements of Language Experience

Multilingual people are often asked to self-evaluate their own language abilities, which entails implicitly or explicitly comparing themselves to others (de Bot, 2019; Gullifer et al., 2021). However, little is known about how this inner comparison process systematically impacts their first- and second-language self-evaluative judgements or whether all self-evaluative measures are comparably impacted (i.e., value-laden judgements about how “good” people are vs. non-value-laden judgments about how frequently they use a particular language).

To address these questions, we investigated whether individual differences in a proxy measure of people’s inner comparison processes (i.e., their language attitudes) impacted L2 and L1 self-evaluations over and above the expected impact of their own objective language skill (i.e., LexTALE performance). Thus, we recruited sixty-two English-French bilinguals who self-identified as fluent in both French and English and regularly used both languages. For both their L2 and L1, participants completed a series of tasks aimed at capturing multiple aspects of their language experience, language attitudes, and objective language abilities. A series of robust regression models fitted to these data showed that people's language-specific attitudes significantly modulated the expected relationship between value-laden L2 self-evaluations and objective L2 performance, but less so for their usage-based L2 self-evaluations. Thus, suggesting that usage-based self-evaluations are likely to be less biased by variable inner comparison processes. Overall, these findings suggest that language attitudes can implicitly or explicitly impact bilingual self-assessments when these involve asking bilinguals to make value-laden self-evaluative judgments of their language abilities. Crucially, these results also have practical implications for the optimal selection of self-report measures within bilingualism research. Specifically, they suggest that non-value-laden self-evaluations are more robust to subjective bias than value-laden self-evaluations. Altogether, our overarching goal was to highlight an important aspect of bilingualism research. That is, self-evaluative judgements or perceptions of language experience and skill are multidimensional and not one single construct (Gullifer & Titone, 2020; Tomoschuk et al., 2019). Importantly, these results also speak to a larger literature on the accuracy with which people can evaluate their own skills for any cognitive domain, as well as the cognitive biases that can impact self-evaluative judgements (Critcher & Dunning, 2009).

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Dresses and ties: the effect of grammatical gender and semantic bias on object concepts

There is empirical evidence across various languages on how the computation of gender morphology during language processing affects the formation of sex-gender representations (Carreiras et al., 1996; Duffy & Keir, 2004), even when related to inanimate objects (Elpers et al., 2022; Phillips & Boroditsky, 2003). At the same time, there are also studies showing effects of gender stereotypes during language processing (Lewis & Lupyan, 2020; Menegatti & Rubini, 2017). However, there are no previous studies conducted in Spanish.

To shed light on this issue, we examined the perceptions and attitudes underlying potential interactions between gender stereotypes in words referring to objects and the grammatical gender of those nouns in Spanish. Furthermore, we explored this relationship in three linguistic communities (Argentina, $n = 224$; Chile, $n = 134$; and Spain, $n = 226$) with different sociolinguistic backgrounds, in light of recent findings showing variations in the processing and use of gender features across different linguistic communities of Spanish (Stetie et al., 2023; Stewart et al., 2021).

We created two lists of 60 nouns (20 masculine, 20 feminine, 20 neutral) with inanimate referents that had either feminine or masculine grammatical gender. Participants judged whether word referents were more likely related to men or women on a 7-point Likert scale. In a 3x2x3 design we manipulated Semantic Bias, that is, the stereotypicality of words' referents with three levels (masculine, e.g., *martillo*, hammer-M; feminine, e.g., *delineador*, eyeliner-M; neutral, e.g., *lápiz*, pencil-M); Gender morphology, with two levels (masculine, e.g., *delineador*, eyeliner-M; feminine, e.g., *cartera*, handbag-F); and Linguistic community, with three levels (Argentina, Chile, Spain).

Our hypothesis was that the incongruence between semantic bias and gender morphology (e.g., *corbata*, tie-F; *vestido*, dress-M) will impact participants' judgments and will generate lower scores in both masculine and feminine conceptually-related nouns. This finding would provide evidence about the influence of grammatical gender marking on the formation of stereotypical mental representations, even in those nouns referring to inanimate entities. We also explored potential modulations between linguistic communities rooted in the different socio-cultural contexts.

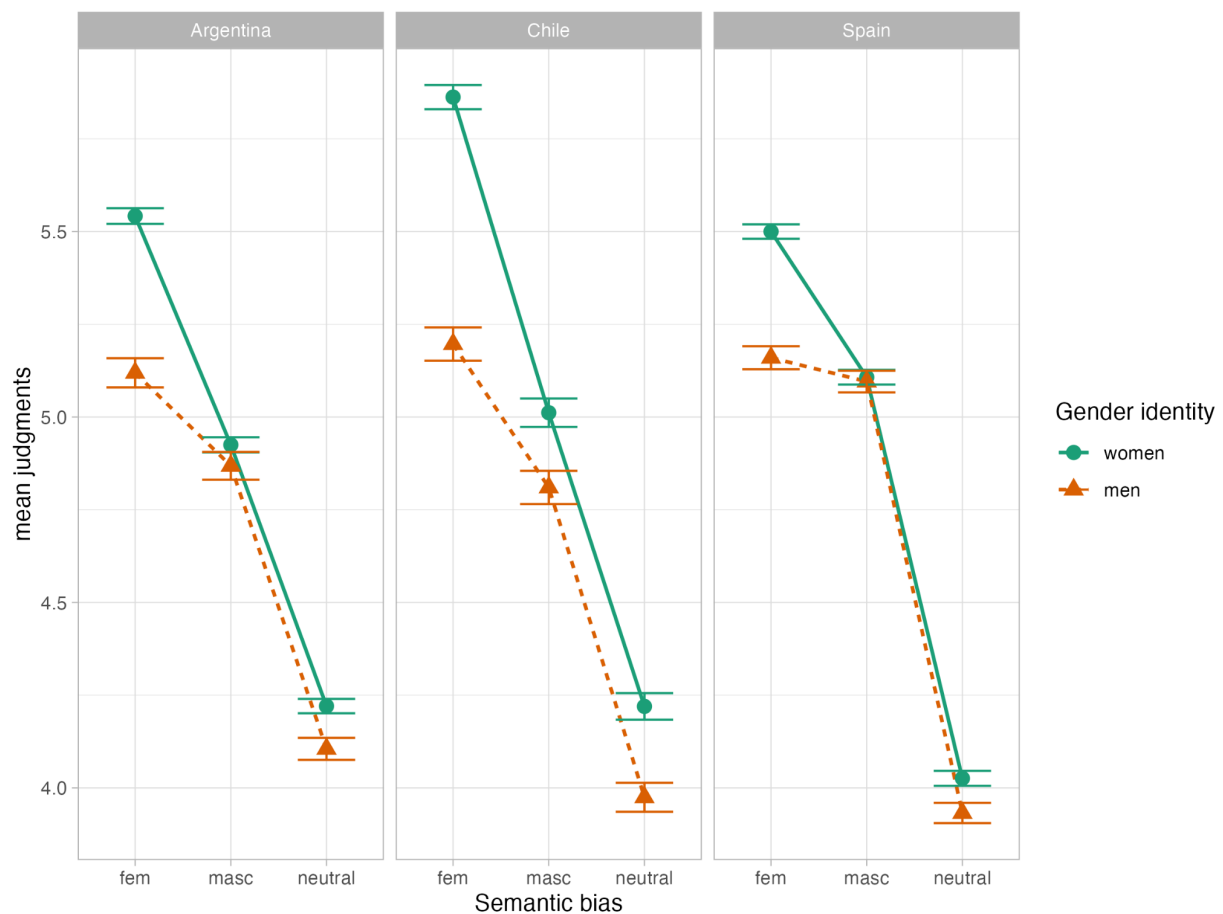
We placed Semantic bias, Gender morphology, Linguistic community and Gender identity as Fixed effects in a series of Linear Mixed Models, considering Participants and Items as random effects. The results showed an effect of Gender morphology in neutral words across the three communities, but not in words with Semantic bias. Interestingly, we also found that participants' gender identity influenced their ratings. As shown in Figure 1, women tend to rate words with feminine semantic bias as more related to women than men, whereas no differences were observed in words with masculine semantic bias.

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Figure 1. Mean judgments by Semantic bias, Linguistic community and Gender identity



The majority of the new words that we learn everyday as adults are morphologically complex; yet the role of morphology in learning new words remains poorly understood. Ginestet et al. (2020) took a step in this direction, revealing that morphological structure aids in processing complex nonwords ("RElerbER") compared to simpler forms ("pelerble"), especially in the early stages of comprehension.

We build on Ginestet et al. (2020) by contrasting the effects of morphology and frequency of letter chunks in novel word learning. We designed three types of items: (i) suffixed novel words (*flibness*), (ii) novel words that end in non-morphological, but frequent letter chunks (*flibew*), and (iii) novel words with non-morphological, low-frequency endings (*flibov*). Words were learned incidentally through sentence reading, while the participants' eye movements were monitored. The learning phase was followed by a recognition memory task, which assessed the explicit memory of the novel items.

The study is developed as a Registered Report, now accepted in RSOS. We conducted a pilot study with 14 participants. Fixation metrics indicated easier processing of the novel words over successive encounters, confirming that participants indeed learned words. Suffixed items were processed faster than low-frequency ending ones (total durations: SUFF = 1154.69 (SD=865.97) vs. LF = 1415.23 (SD= 910.80)). Recognition memory task showed successful word recognition (mean accuracy = 0.81 (SD=0.37)), with the advantage for suffixed items (mean accuracy SUFF = 0.90 (SD=0.30) vs. HF = 0.76 (SD= 0.43) vs. LF = 0.76 (SD= 0.43)).

In sum, the final results will clarify if novel word learning is aided only by suffixes or can also benefit from mere frequent letter chunks. Furthermore, we aim to determine whether these effects are limited to implicit processes, as evidenced by eye-tracking measures, or if they extend to conscious awareness, as indicated by performance in the recognition memory task.

AXIOLOGIC CONCEPTUALIZATION OF VIOLENCE IN MEDIA DISCOURSE

Keywords: conceptualization, violence, media, evaluation, ideology

The aim of this talk is to examine the role of axiological parameters in the construal of violent behavior in the political discourse of mass media and social media. More specifically, we sought to answer the following research questions: (1) how aggressive behavior is conceptualized in the political domain of the world construal; (2) what distinguishes the concept of AGGRESSION in mass media vs social networks; (3) what are discourse strategies of violent behavior in these two types of discourse?

In psychology, aggression is defined as any behavior intended to cause harm to other individuals who are motivated to avoid it (Anderson & Bushman, 2002). We hypothesize that, in political discourse, the axiological and ideological values are crucial in construal of violent actions; while social, linguistic as well as other properties add to their conceptualization.

In search of a new methodology for proving this hypothesis, we chose cognitive pragmatics (Schmid, 2012; Shevchenko et al., 2020). In a cognitive perspective, this present study proceeds from the theory that linguistically expressed construal of events guides their conceptualization (Fauconnier & Turner, 2002). In a pragmatic perspective, meaning making is verbalized in discourse strategies and tactics.

The materials for this in-progress research come from American and British online quality press and social networks posts featuring Russia-Ukraine war. Our preliminary results show that among different types of aggression political discourse reveals *vandalism* and *terrorism* as characteristic of collective behavior. Different variables of the conceptualization of violence in political discourse include personality (sender – receiver of information), situation and context, emotions, etc. However, axiological (moral, judicial) and ideological (democratic vs dictatorial) values are crucial for violence conceptualization.

We will argue that mass media conceptualize AGGRESSION as a comprehensive expression of unprovoked THREAT, ATTACK, WAR, MASSACRE, CASUALTIES, DESTRUCTION, which mostly receive negative evaluation. However, social networks display the users' more ambiguous and more emotional involvement with regard to the violence construal. We tend to interpret this differences in terms of moral, ideological, and cultural dimensions.

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A growing trend among young Cantonese speakers is to mix morphographic (logographic) Chinese characters and words in Latin graphemes in social media exchanges. In languages such as Japanese, switching between morphographic and phonographic scripts incurs little processing cost in lexical decision (Bowers & Michita, 1998), presumably because both scripts are indigenized. Since using Latin graphemes is relatively uncommon in traditional Chinese contexts, we conducted an experiment to determine: (i) whether script-mixing incurs recognition costs due to Inhibitory Control of the less relevant language (De Bot, 2020 Green, 1998), or (ii) whether Dual Activation of both languages (e.g., Grosjean, 2008; Van Heuven & Dijkstra, 2010) mitigates these effects. Cantonese speakers in Macao (n=92; 50 females, 42 males; mean age=22.7, *SD*=2.7) completed a self-paced reading task. Paired sentences were either entirely in Chinese characters or had one region presented in Latin graphemes (30 pairs, 14 distractors). All sentences contained 8 words and had identical syntactic structure, as in:

酒店	住客	個	蛋糕	送到	豪華	套房
Hotel	resident	's	cake	was sent to	grand	suite

All 30 targets in Latin graphemes were present in the Cantonese Web Corpus, (containing ~43 million tokens from the Internet). The results indicate that processing costs for script-mixing appear to differ by sentential position: Costs emerged in items in the subject and direct object where the semantic head of the phrase was yet to be unidentified (e.g., possessive markers or adjectives). In short, a combination of parsing load and script switching seems to result in a cost. We conclude with a brief discussion of how script-mixing costs are offset by the benefits of “trendiness” and the convenience of transliteration (as per questionnaire data). In English-speaking settings, this would be analogous to the use of icons, ideographs, and morphographs, such as <3 or <} for (*lonely*) *heart* or *ice-cream* respectively, in social media exchanges.

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Politics and personality modulates processing of singular-‘they’ pronouns: Evidence from self-paced reading and acceptability ratings

Hannah Lam & Juhani Järvikivi (University of Alberta)

Even though gender neutral use of pronouns, such as *they/their*, can promote more inclusive, less stereotype reinforcing language use (e.g., Sczesny et al., 2016; Bradley, 2020; Arnold et al., 2021), research on how we process gender neutral pronouns is still scarce. Research has shown a processing cost for ‘they’ when it refers to gendered nouns, as in *“The secretary/soldier was walking in the park when she/he/they saw a fat squirrel” (Foertsch & Gernsbacher, 1997; Sanford & Filik, 2007, for English; Vergoossen, 2021, for Swedish). Singular *they* is rated less acceptable than stereotype matching gendered pronouns (e.g., secretary-she, soldier-he) but more acceptable than mismatching ones (e.g., secretary-he, soldier-she) (Doherty & Conklin, 2017). Moreover, the processing cost for singular *they* is lowest when it refers or to an expected gender prompted by the context (Foertsch & Gernsbacher, 1997).

Using self-paced reading and acceptability rating, we studied the processing of gender-neutral nominative “they” and genitive “their” compared to their gendered counterparts in sentences such as the above (*). In addition, we investigated whether participant-based (N=201) differences in personality (HEXACO PI-R) and political ideology affect reading times and ratings.

Generalized-additive mixed-models showed significant differences in reading and rating ‘they’ compared to congruent feminine “she/her” but not to congruent masculine “he/his” pronouns. Nominative ‘they’ is read faster and rated better than genitive ‘their’. Individual differences were found to modulate processing of ‘they’ pronouns. We found that conservative participants took longer to read and gave lower ratings for ‘they’ pronouns than congruent pronouns. Less empathetic participants took longer to read ‘they’ pronouns than congruent masculine pronouns (e.g., soldier-he). Participants who scored lower on emotionality and honesty rated ‘they’ pronouns significantly worse than congruent feminine pronouns.

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How does math-specific language experience impact word problem-solving in bilingual adults?

The fields of numerical cognition, word problem solving, and multilingualism have remained relatively separate, despite the shared connections between language and mathematics. Past work within mathematical cognition has investigated numerical factors that impact word problem solving; however, this work has not emphasized the linguistic context (Daroczy et al., 2015). Conversely, past work within bilingualism investigating word problem solving usually focuses on problem comprehension; however, this work has not emphasized the calculation component (Peng et al., 2020).

Bridging this gap, we investigated how bilingual adults read and process numerical information embedded in word problems in their first or second language. We specifically addressed how differences in math-specific language use impacted: 1) reading strategies for word problems containing exact (e.g., addition) and inexact (e.g., comparison) operations; and 2) people's decision times for word problems when accepting or rejecting proposed answers that were correct or incorrect. We asked 57 English-French bilingual adults to read a series of two-sentence English word problems in a self-paced manner (e.g., "Maria catches 3 fish, Karen catches 8 fish, and Shawn catches 1 fish"), with the goal of either adding (e.g., "how many fish do Maria and Karen catch") or comparing quantities (e.g., "Does Maria or Karen catch more fish?") across two counterbalanced blocks.

There were four key results. First, task accuracy was uniformly high for all participants and conditions. Second, people's decision times were slower for exact operations (i.e., addition) than for inexact operations (i.e., comparisons). Third, overall, acceptance of proposed correct answers was faster than rejection of proposed incorrect answers. Finally, individual differences in math-specific language experience modulated both people's reading and decision speed. Specifically, people who frequently use English arithmetically took longer to read the same word problem when followed by an inexact comparison operation compared to problems followed by an exact addition operation. For decision speed, high percentage use of English arithmetically resulted in faster decision times for inexact comparison operations compared to exact addition operations.

Taken together, results suggest that bilingual experience impacts the time taken to encode and make mathematical decisions, particularly for inexact comparison operations that are inherently more language dependent. However, bilingual experience does not impact the outcome of those mathematical processes (i.e., decision accuracy). Whether this extends to mathematical situations where reading/processing time is fixed rather than at the reader's discretion is a question that we are now pursuing.

Attraction Effects in the Processing of Long-distance Chinese Classifiers: An eye-tracking study

This study investigated memory retrieval processes during the online processing of the classifier-noun agreement in Chinese, using the eye-tracking method. Previous studies suggested that the retrieval processes involved in the processing of an agreement are affected by an illicit antecedent (hereafter *distractor*) as well as a licit antecedent (Dillon et al., 2013; Kwon & Sturt, 2016). These results were taken to suggest that memory retrieval processes are parallel and content-addressable such that a distractor with matching features to the retrieval cues could be mis-retrieved (McElree et al., 2003; Lewis and Vasishth, 2005; Van Dyke and McElree, 2006) as a last resort to save the sentences particularly when they are ungrammatical (Wagers et al., 2009).

However, these studies were based on binary features, and thus do not provide information on the effect of the degree of semantic overlap between the distractor and a retrieval cue. Thus, in this study, we created four conditions manipulating the semantic distance between the classifier and the distractor (Table 1). The Grammatical condition included a classifier matching its licit noun. The Distractor-Matching condition included a classifier matching the distractor. The Distractor-Related condition included a classifier related to the distractor. The Distractor-Unrelated condition employed a classifier unrelated to the distractor. Note that all these conditions are ungrammatical except for the first condition. The results found a significant grammaticality effect: at the classifier spillover position (R8_9), the Grammatical condition was processed faster than the remaining three conditions (Figure 1 & 2). Additionally, both Distractor-Related conditions did not significantly differ from the grammatical condition, indicating that processing difficulty was reduced when the distractor was semantically related to a retrieval cue. But these two conditions did not differ. These results suggest that (i) the parser is sensitive to the grammatical constraints of the classifier-noun agreement, but (ii) the retrieval processes during the processing of the agreement are also sensitive to semantic features. However, (iii) our results do not provide evidence for gradient effects of semantic relatedness.

Table 1. Sample Experimental Sentences

Grammatical condition	花儿 flower	吸引了	很多	小狗	其中	一只 <i>zhi</i>	是	金毛
Distractor-Matching	花儿 flower	吸引了	很多	小狗	其中	一朵 <i>duo</i>	是	金毛
Distractor-Related	小草 grass	吸引了	很多	小狗	其中	一朵 <i>duo</i>	是	金毛
Distractor-Unrelated	食物 food	吸引了	很多	小狗	其中	一朵 <i>duo</i>	是	金毛
Gloss	Flower/flower/grass/food	attract	many	dog	among	one classifier	is	Golden retriever
Trans.	'Flower/flower/grass/food attracts many dogs, among which one is a golden retriever.'							

Note: In Grammatical condition, *zhi* is the classifier matching the target noun 'dog'. In Distractor-Matching condition, the classifier *duo* matches the distractor 'flower'. In Distractor-Related condition, the classifier *duo* is related to the distractor 'grass'. In Distractor-Unrelated condition, the classifier *duo* is unrelated to the distractor 'food'.

Figure 1&2. Total duration at the distractor position/ classifier spillover position

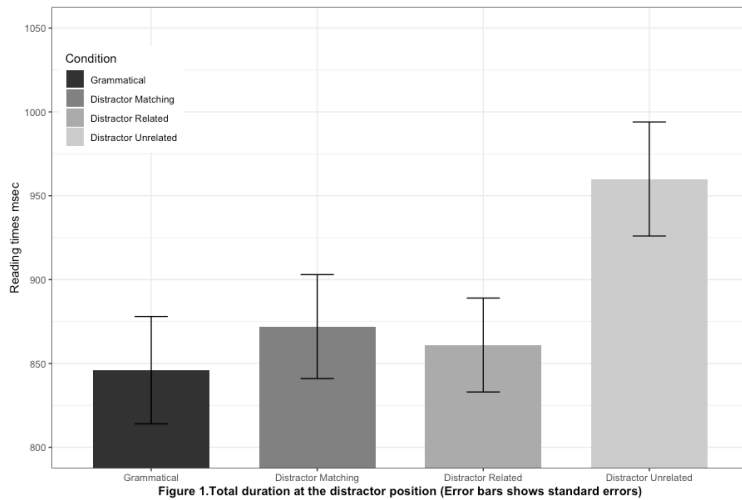


Figure 1. Total duration at the distractor position (Error bars shows standard errors)

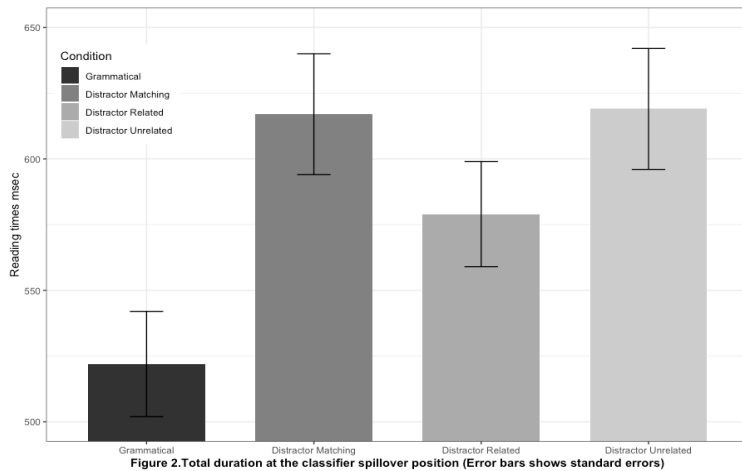


Figure 2. Total duration at the classifier spillover position (Error bars shows standard errors)

The Influence of a Password's Linguistic Properties on its Typing Output

Passwords and passphrases are composed of strings of letters and numbers, and can be made more secure by adding capital letters and special characters. Importantly, passwords and especially multi-word passphrases contain words and other linguistic units, which influence their typing production. Examining keystroke latencies (the speeds of individual keystrokes) has been used to examine how the linguistic properties of words impact their typing production. Keystroke latencies are comparable to pauses during speech production; they are thought to reflect the planning and incorporation of linguistic information during the typing of a word. While numerous studies have examined the influence of linguistic properties of words on their typing output (e.g., Inhoff, 1991; Taikh et al., 2023), few studies have examined this in passwords. We examine how the linguistic properties of passwords influence their typing production.

The keystroke execution during the typing production of a word has been found to be influenced by the linguistic properties of the context it is embedded in, including the word immediately following the one being currently typed. Recently, Taikh et al., (2023) found that, when typing compound words (e.g., highlight), the linguistic properties of the second constituent (light) influenced the keystroke latencies of the first constituent (high). Specifically, output of the first constituent was faster when the second constituent was easier to access and integrate with the first constituent. The findings of Taikh et al. are similar to those of Inhoff (1991), who found that words are typed faster when followed by higher frequency words. These findings suggest that we are accessing the subsequent word and planning its production while outputting the current one. Importantly, the linguistic information of the next word influences the motor execution of the keystrokes of the word being typed.

Adding capital letters to passwords is a common way to make them more secure. Unfortunately, capital letters can also make the passwords more difficult to type, and the effect of their inclusion in passwords is thus important to investigate (Tombarello & Greene, 2015). For example, Stanton and Greene (2014) found that when typing passwords the majority of the errors that occurred were attributed to improper capitalization. Our study examines the effect of uppercase letters on the typing production of three-word passphrases. Specifically, we test whether the keystroke latencies during the output of a word (e.g., *knapsack* in the passphrase *knapsacksapphireostrich*) are influenced by the inclusion of capital letters in the subsequent words of the passphrase. Participants will be asked to type multi-word passphrases that include no capitalization, capitalization in the middle of the second or third word. If an uppercase letter in a subsequent word makes it more difficult to access and to plan its production, then the output of the current word should be slowed down. Our findings may contribute to the understanding of how to create passphrases that are secure but also easy to type.

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When words collide: Compound recognition via hemifield processing

How are compound words recognized? Does the meaning of a compound play a role in its recognition during the early moments of visual perception? And what is the role of the modifier/head structure of an English endocentric compound in the recognition process? We addressed these questions by employing two tasks manipulating compound hemifield rapid presentation. We relied on the well-known differences in hemi-retinotopic projections, which split visual information presented to the left visual field to the right hemisphere and information presented to the right visual field to the left hemisphere. Crucially, when English endocentric bimorphemic compounds are split into visual fields, the compound head is projected directly onto the language-dominant left hemisphere—possibly with a head-start analysis by the visual word form area (VWFA; Cohen et al., 2000). Considering that the transfer between hemispheres is estimated to be in the magnitude of 10-40 ms (Brown et al., 1998 Nowicka & Tacikowski, 2011) we also manipulated the spatial and temporal presentation of compound constituents.

Our study involved a temporal order judgement (TOJ) and a lexical decision (LD) task that included elements of the TOJ paradigm. In the LD task participants were asked to make word-nonword judgements to disjointly presented (60 ms apart) segments of compounds (FOOTBALL), pseudo-compounds (e.g., CARPET), and unsegmentable monomorphemic words (e.g., JINGLE). We manipulated both the spatial location of constituents (e.g., FOOT appears in the left visual field with BALL in the right or vice-versa) and their temporal order (e.g., FOOT presented 60 ms before BALL or BALL presented before FOOT). We also manipulated the legality of the segments (e.g., FOOT+BALL or FOO+TBALL) See Table 1. In the TOJ task, segments were presented in rapid succession and participants had to judge which segment appeared first, about two degrees of visual arc to the left or to the right of a central fixation cross. In both tasks, segments appeared for 60 ms and backward masked.

Participants response times and accuracy (in percentage) were input into linear regressions Preliminary results for the TOJ task (N=8) demonstrate no effect of word type, split type, spatial congruency or temporal congruency on response times or accuracy. However, for the LD task (N=6), preliminary results demonstrate greater accuracy for compound word recognition when spatial and temporal presentation modes are congruent ($t = 2.197, p = 0.0284$). Additionally, legal splits demonstrate faster reaction times than illegal splits when stimuli are spatially congruent ($t = 2.154, p = 0.0319$). We expect to report data on 20 participants aiming to understand the early codes of word recognition stemming from these two novel tasks. In particular, we will discuss the role of the head and morpho-semantic factors in compound recognition.

Table 1: Stimuli conditions

Split Type	Word Type		
	Compound	PseudoCompound	Unsegmentable Monomorphemic
Legal	DAY + DREAM DAY + DREAM DREAM + DAY DREAM + DAY	TRIP + LET TRIP + LET LET + TRIP LET + TRIP	LABY + RINTH LABY + RINTH RINTH + LABY RINTH + LABY
Illegal	DAYDR + EAM DAYDR + EAM EAM + DAYDR EAM + DAYDR	TRI +PLET TRI + PLET PLET + TRI PLET + TRI	LABY + RINTH LABY + RINTH RINTH + LABY RINTH + LABY

Note: Segments shown in bold are just to illustrate the temporal order factor (60 ms asynchrony). In the experiment, both segments were presented with the same font.

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When Words Collide: Word Recognition Under Foveal Split

How does the word recognition system integrate information presented in different visual hemifields? We addressed this question by employing two tasks manipulating compound hemifield rapid presentation. We relied on the well-known differences in hemi-retinotopic projections, which split visual information presented to the left visual field to the right hemisphere and information presented to the right visual field to the left hemisphere. Crucially, when English endocentric bimorphemic compounds are split into visual fields, the compound head is projected directly onto the language-dominant left hemisphere—possibly with a head-start analysis by the visual word form area (VWFA; Cohen et al., 2000). Considering that the transfer between hemispheres is estimated to be in the magnitude of 10-40 ms (Brown et al., 1998 Nowicka & Tacikowski, 2011), we also manipulated the spatial and temporal presentation of compound constituents in a novel variation of a temporal order judgment (TOJ) task. The TOJ task was proposed in 1969 by Gibbon and Rutschmann; it was originally intended to show a correlation between reaction time (RT) and temporal order of two visual stimuli, but has since been adapted to the investigation of a wide variety of phenomena in visual perception and attention, employing different types of stimuli.

Our study involved a TOJ and a lexical decision (LD) task that included elements of the TOJ paradigm. In the LD task participants were asked to make word- nonword judgements to disjointly presented (60 ms apart) segments of compounds (FOOTBALL), pseudo-compounds (e.g., CARPET), and unsegmentable monomorphemic words (e.g., JINGLE). We manipulated both the spatial location of constituents (e.g., FOOT appears in the left visual field with BALL in the right or vice-versa) and their temporal order (e.g., FOOT presented 60 ms before BALL or BALL presented before FOOT). We also manipulated the legality of the segments (e.g., FOOT+BALL or FOO+TBALL). See Figure 1. In the TOJ task, segments were presented in rapid succession and participants had to judge which segment appeared first, about two degrees of visual arc to the left or to the right of a central fixation cross. In both tasks, segments appeared for 60 ms and backward masked for 500ms. Further, 168 target words were presented (56 compounds, 56 pseudocompounds, and 56 unsegmentable monomorphemics), as well as 168 filler non-words.

Participants response times and accuracy (in percentage) were input into linear regressions. Preliminary results for the TOJ task (N=17) demonstrate a statistically significant difference in accuracy between temporal congruency and incongruency across word type ($t = -12.411$, $p < .0001$). A similar effect is found between spatial incongruency and congruency ($t = -3.445$, $p = 0.0006$). No significant effects were found on response times in the preliminary analyses. For the LD task (N=16), preliminary results indicate that congruent conditions are associated with greater accuracy compared to incongruent conditions for compounds ($t = -4.889$, $p < .0001$), pseudocompounds ($t = -7.621$, $p < .0001$), and unsegmentable monomorphemics ($t = -8.987$, $p < .0001$). Response times were faster for pseudocompounds in spatially congruent conditions ($t = 2.238$, $p = 0.0254$). Although it is early to draw major implications from this pattern of results, there is a clear similarity between compound and pseudocompound processing, which is in line with theories that posit an early morpho-orthographic segmentation during word recognition.

Figure 1: Stimuli Manipulations

Split Type	Word Type		
	Compound	PseudoCompound	Unsegmentable Monomorphemic
Legal	DAY + DREAM DAY + DREAM DREAM + DAY DREAM + DAY	TRIP + LET TRIP + LET LET + TRIP LET + TRIP	LABY + RINTH LABY + RINTH RINTH + LABY RINTH + LABY
Illegal	DAYDR + EAM DAYDR + EAM EAM + DAYDR EAM + DAYDR	TRI +PLET TRI + PLET PLET + TRI PLET + TRI	LABY + RINTH LABY + RINTH RINTH + LABY RINTH + LABY

Presented First

References:

- Brown, W. S., Bjerke, M. D., & Galbraith, G. C. (1998). Interhemispheric transfer in normals and acausalos: Latency adjusted evoked potential averaging. *Cortex*, 34(5), 677–692. [https://doi.org/10.1016/s0010-9452\(08\)70772-x](https://doi.org/10.1016/s0010-9452(08)70772-x)
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Foreign-origin words and their native equivalents in the Turkish Lexicon:

An investigation of relative frequencies and semantic relatedness

Abstract

Cross-cultural interactions have injected many Arabic, French and Persian origin words to the Turkish language that remain in modern Turkish vocabulary despite explicit language reform to introduce Turkish equivalents to foreign-origin words¹²³. In this study we aim to elucidate the actual use of the foreign-origin words and their Turkish counterparts in terms of both frequency and meaning on the basis of native Turkish speakers' intuitions, using both corpus data and experimental methods.

For the pilot study, we first selected sample bisyllabic Turkish/Foreign-origin word pairs representing the same semantic concept. Using word frequency data from the Turkish National Corpus⁴, we validated whether the pairs had similar enough frequencies in written text (within ± 1.5 Zipf value⁵) to represent equivalent semantic concepts (Fig 1, Table 1). Together, all this ensured that frequency, length, and part of speech differences are balanced (a prerequisite for the next steps of our project).

To verify the selected pairs with native speaker intuition, we are conducting a web-based study using Gorilla Experiment Builder⁶, involving 2 tasks. In the Word Association Task (WAT), participants suggest words similar in meaning to presented stimuli (either of the paired words from the pilot) - independently generating the intended pair will confirm the word pairs' semantic equivalence in participants' mental lexicon. In the Semantic Relatedness Task (SRT), participants judge relatedness of two stimuli (the intended word pair, or one of the pair words with an unrelated word) on a Likert scale (1-7), with reaction times recorded - allowing quantitative evaluation of participants' relatedness judgments compared to baseline unrelated words. We expect to complete data collection by end-2023.

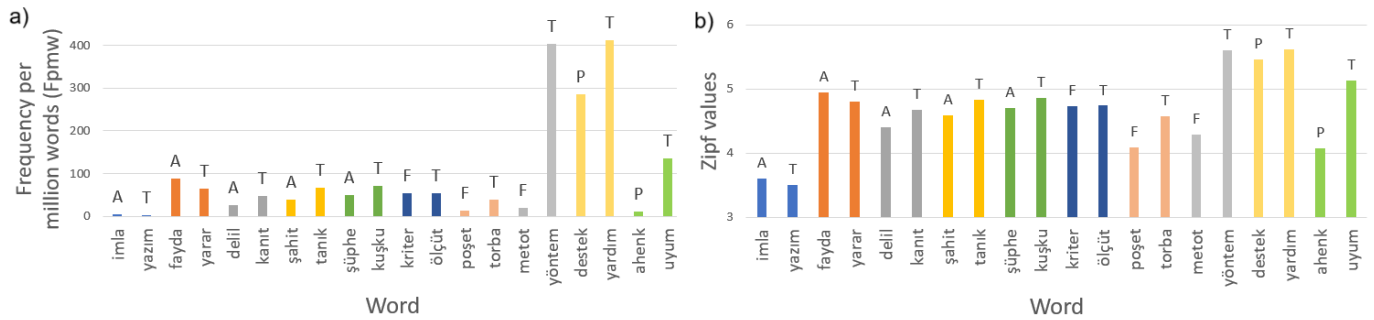
The resulting word pairs will inform a future lexical priming study⁷ which will, in turn, shed light on the mental representation⁸ of foreign origin words and their native counterparts in Turkish.

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Figures and Tables

Fig 1. Frequencies and Zipf Values of Representative Word Pairs



a) Frequency per million words and b) Zipf Values ($\text{Zipf} = \log_{10}(\text{Fpmw}) + 3$) for 10 representative word pairs of the total 23 chosen pairs. Words from the same pair are in the same colour. Origin language is marked as (T) Turkish, (A) Arabic, (P) Persian, or (F) French. A 5:3:2 ratio of Arabic:French:Persian pairs was used, same as that used in the Word Association Task. Fpmw was converted to Zipf values, i.e., a logarithmic scale, to make them more comparable (Van Heuven et. al 2014). Word pairs within ± 1.5 Zipf value were considered of similar enough frequency to represent equivalent semantic concepts.

Table 1. Calculating Differences in Zipf Values for Representative Word Pairs

English Meaning	Foreign Language	Foreign-origin word	Fpmw	Zipf value	Turkish word	Fpmw	Zipf value	Δ Zipf values
spelling	Arabic	imla	4.01	3.6	yazım	3.20	3.51	0.09
benefit	Arabic	fayda	88.96	4.95	yarar	64.84	4.81	0.14
evidence	Arabic	delil	25.36	4.4	kanıt	47.36	4.68	0.28
witness	Arabic	şahit	38.52	4.59	tanık	66.91	4.83	0.24
doubt	Arabic	şüphe	50.42	4.7	kuşku	71.72	4.86	0.16
criterion	French	kriter	54.10	4.73	ölçüt	55.05	4.74	0.01
bag	French	poşet	12.38	4.09	torba	38.12	4.58	0.49
method	French	metot	20.00	4.29	yöntem	403.25	5.61	1.32
harmony	Persian	ahenk	12.12	4.08	uyum	135.49	5.13	1.05
support	Persian	destek	285.50	5.46	yardım	412.33	5.62	0.16