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WORDS IN CONTEXT

How Do Our Brains Plan Phrases?

Liina Pylkkanen [1]

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An understanding of the combinatory system of human language must include a characterization of how the system is used in both language comprehension and production, as well as across different modalities. Our work has queried the neural bases of basic composition for reading, listening, speech production, and sign language production. In this talk I will summarize our production findings. Initially, we demonstrated that phrase planning in production elevates neural signals in the same regions as phrase comprehension, albeit with different timing. These findings have generalized to sign language production. In comprehension, we have shown that the left anterior temporal lobe, a predominant site for composition, is highly sensitive to conceptual specificity. This suggests it is not a syntactic site, but rather contributes to some form of conceptual combination. I will show evidence that its role in production is likely similar. Finally, with decoding methods, we have tracked the activation of individual lexical items from picture onset until articulation onset. We observed that during the planning of adjective-noun combinations, the representation of the noun is stronger, more decodable, and more sustained than that of the adjective, potentially reflecting its status as the head of the phrase. Although studying composition in production is more challenging than in comprehension, I will conclude by discussing some advantages of production for revealing key properties of the language system.

Beyond Bare Picture Naming

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Researchers studying spoken word production have long employed (bare) picture naming tasks in their experiments to advance our knowledge on the (neuro)psychology of language production. Some researchers also use part of this knowledge to inform diagnosis and treatment of language disorders. In this talk, I will explore what we could gain from studying spoken word production beyond bare picture naming. I will review word-production studies form my own group employing different tasks combined with behavioural and brain-based measures, both in neurologically healthy speakers and in speakers with brain damage. I will also examine some of the issues we, as a field, face at the operationalisation level and the impact these issues have on clinical applications of the knowledge we, as a field, produce.

The agrammatism-paragrammatism distinction and the neurobiological architecture of grammatical encoding

William Matchin [1]

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The influential psycholinguistic model of sentence production developed by Bock and Levelt (1994) posits two stages of grammatical encoding: functional processing and positional processing. However, most research in the cognitive neuroscience and aphasiology of syntax does not align well with this two-stage model of grammatical encoding. I will review recent research on the neurobiology of syntax in my laboratory and with collaborators, including a novel coding scheme for agrammatic and paragrammatic speech errors at the utterance level in people with aphasia. I will then illustrate how a two-stage model of grammatical encoding aligns well with the data, but does not precisely match the processing mechanisms of Bock and Levelt. Finally, I will discuss the relationship between this model and the ones proposed by Matchin & Hickok (2020) and Krauska & Lau (2023).

POSTER SESSION 1

1-01: A meta-analysis of subject-verb agreement production

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When do errors in subject-verb agreement like 'The key to the cabinets* were rusty' happen? Earlier work has shown that grammatical properties, like the mismatch asymmetry between head and local noun number (e.g., Bock & Miller, 1991), and semantic properties, like notional number (e.g., Vigliocco & Semenza, 1995) promote erroneous plural verb productions. The typical study design used to elicit agreement errors involves auditory or written sentence fragments containing inflected noun phrases that the participant has to repeat back and add a completion to (e.g., Bock & Miller, 1991). This study design has been used to elicit agreement errors in many languages, with some suggestion that the morphological properties of languages impact the strength of notional agreement (see Foote & Bock, 2012). As such, the domain is ready for a systematic meta-analysis. In addition to differences between languages, we are interested in the effect of task type and if there is evidence of bias over time.
We identified 99 papers in the citation tree of Bock and Miller (1991); 52 of these have currently been coded with the rest in progress. We coded each paper for: year of publication, language, L2 status, participant age, the syntactic structure of the preamble, preamble notional number, and several aspects of experimental task (preamble presentation, memory load, response modality).

A mixed-effects meta-analytic model showed that the number and notionality of head and local nouns, the L2 status of participants, preamble presentation, and language in which the experiments were conducted significantly predicted agreement errors in the current data set. Errors occurred frequently when head and local noun number differed, and particularly for singular heads with plural local nouns (e.g. 'key to the cabinets'). Notionally plural items with singular heads and plural local nouns (e.g. 'label on the bottles') also elicited many errors. More errors occurred when participants were not native speakers of the language. More errors occurred in auditory compared to visual stimulus presentations and when a picture was used in the elicitation task. Fewer errors were made in Russian and Hebrew than English, French, Dutch, Portuguese, or Spanish.
Overall, our results confirm earlier findings: there is a clear mismatch asymmetry in number agreement production, and notional factors also clearly matter for agreement. They also show a role for differences across languages that might be explained by morphological factors, and a role for the various aspects of the task that might impact memory or processing.

1-02: A neural sequence decoder model of phonological and semantic priming effects on whole-word phonetic duration

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The fluency of language production is sensitive to a wide variety of factors, such as phonological neighborhoods and semantic networks (Oppenheim & Nozari, 2024). The production of semantically similar words in close succession has been shown to initially facilitate and then impede production (Oppenheim, Dell, & Schwartz, 2010; Fink, Oppenheim, & Goldrick, 2018), while the production of phonologically similar words leads to slowdowns in speech rate, including phonetic duration (Sevald & Dell, 1994; Buxó-Lugo, Jacobs, & Watson, 2020; Watson, Buxó-Lugo, & Simmons, 2015; Fink et al., 2018). Hearing or producing two phonologically overlapping words leads to slower whole-word durations, suggesting that access to a word's phonology is impeded when competitors exist during lexical production because the more recent phonological sequence is more active (Sevald & Dell, 1994). Preliminary data (Tippenhauer, Jacobs, & Watson, 2018) suggest that duration in American English is insensitive to semantic similarity, while phonological overlap may lead to earlier speech onsets and longer whole-word durations.

We take inspiration from the simple recurrent network of Watson et al. (2015) to account for the production of primes and targets that vary in their semantic and phonological similarity for single-syllable minimal pairs (e.g., cap/cat/mouse) and to capture the effect described in Tippenhauer et al. (2018). We will construct a sequence decoder model trained to output a phonological sequence on the basis of semantic representations of two words produced in sequence. Then, this trained model will "enter the lab" and produce prime-target pairs. At the prime step, the model will output each segment for the prime from its semantic representation alone; at the target step, the model will output each segment for the target from its semantic representations in the context of having just produced the prime. Primes will either be unrelated, phonological related, semantically related, or both semantically and phonologically related.

We will evaluate this model for its ability to predict word duration effects. Specifically, we expect the activation of a differing segment to be significantly lower after producing a phonological competitor, indicative of slower speech rates, but this will not hold for semantic primes. Conversely, we expect the production of a semantic competitor to increase activation to the first segment, and to a greater extent than phonological competitors.

1-03: Bidirectional influences of speaking and driving under increased cognitive load

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Speaking often feels effortless in everyday situations. However, in more challenging contexts, it can be hard to maintain fluency. Dromey & Simmons (2019) examined this issue by asking participants to speak while driving in a driving simulator and found that performance on both the speaking and driving tasks declined when the tasks were performed simultaneously (see also Becic et al., 2010). These findings are taken to suggest that language production processes are impacted by the availability of cognitive resources.
In these and other studies, participants' performance in a dual-task condition was compared to speaking-only, showing that language production performance declines under increased cognitive demands. However, such comparisons do not measure the link between speaking and cognitive resources directly. The question arises whether the dual-task context in itself is sufficient to alter speaking performance throughout the task, or whether speaking performance is only altered when the concurrent task requires more cognitive resources.

In this study, we aimed to establish a more direct link between measures of speech fluency typically taken to indicate planning difficulties in language production and measures of cognitive control and attention. We did so by comparing speaking performance in virtual driving scenarios of varying difficulty and by examining whether participants' on-going performance on the language task can be related to on-going measures of control and attention in the driving task (variability in velocity and lateral position).
Participants responded to prompts in three conditions: speaking only (no driving), easy driving, and difficult driving. Speech ratio (ratio of time spent speaking relative to total time of a task), speaking rate (number of syllables per second), sentence complexity, and number of filled pauses were compared across conditions. We also used Granger causality analysis to test whether variability in velocity or lateral position predicts upcoming speaking behavior, and vice versa.
Speech ratio was higher in easy compared to difficult driving, suggesting that participants produced more or longer silent pauses in the difficult condition. Participants also produced less complex sentences when driving, especially in the difficult condition. Variability in velocity and lateral position predicted changes in speech ratio (and vice versa) in the difficult driving condition only. These findings show for the first time that measures indicating the availability of cognitive resources and speaking fluency interact with each other in real time when tasks are performed under increased cognitive load.

1-04: Blueberries and bunkbeds: what compounds tell us about morphological structure in production

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In the present ERP study, we investigated morphological structure in language production by looking at compound picture naming. While much work has explored the comprehension of complex wordforms (Amenta and Crepaldi 2012), many questions still remain about their production (Schiller & Verdonschot 2019). Compounds (e.g., 'firetruck') provide the perfect test ground since they are morphologically complex nouns composed of a head ('truck') and a modifier ('fire'), which nevertheless map to a single concept and can be easily named from a picture. Previous work has shown opposing effects of semantic primes on RTs and ERPs for monomorphemic picture naming: while semantic primes slow down naming of a related target picture, they result in a reduced N400 response (Blackford et al. 2012). In contrast, morphological priming of the compound head has been shown to both facilitate RTs and reduce N400 amplitudes (Koester & Schiller, 2008). Here for the first time we directly compare the behavioral and ERP profiles of morphological ('truck'), semantic ('siren'), and phonological ('trust') auditory primes presented prior to naming the target picture ('firetruck'), relative to an unrelated control condition. In the phonological condition the prime shared the onset and the nucleus of the first syllable with the head of the compound ('trust'-'firetruck').

Although data collection is ongoing, preliminary ERP results (n=22) show a reduced N400 response over posterior electrodes with similar amplitude and onset latency for semantic ($p < .05$) and morphological ($p = .06$) priming, while the N400 to phonological primes patterns with the unrelated condition. In contrast, behavioral results show a numerical trend towards naming being slowed by phonological and semantic priming but speeded by morphological priming, as observed in prior work. Together, these results suggest that effects of morphological overlap on production are not a simple combination of meaning and form overlap. We hypothesize that although semantic and morphological primes provide different sources of evidence, both help participants converge towards a small set of candidate responses more quickly, resulting in a reduced N400 effect. However, while the semantic prime is also a potential competitor to the target name, the head of the compound facilitates access to the whole compound but is not a potential competitor to it, resulting in opposing behavioral effects. Further analyses on the completed dataset will explore potential differences in topographical distribution of the semantic and morphological N400 effects and will more closely examine later time windows.

1-05: Can smartphone use affect the way parents talk to their child? Prosodic and lexical alterations due to technoference in mothers' speech

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Smartphone use is an integrated part of a parent's life, and has been suggested to affect the typical socio-pragmatic cues characterizing parent-child interaction. Our hypothesis is that parental use of mobile technologies during interaction (technoference) can lead to a disruption of relevant lexical and prosodic features characterizing child-directed speech (CSD). Among its features, CDS includes slower speech rate, higher fundamental frequency, greater pitch variations, as well as a high proportion of questions and word repetitions. Using a modified still face paradigm, we asked 40 mothers to interact with their 6-months old child in a laboratory room. After a first phase of free play, the mother received a call/SMS from the experimenter and engaged with her (technoference), before returning to interact with the child (reunion phase). For each mother, we analysed the first and last phase acoustically, in terms of fundamental frequency (f0) and speech rate, and lexically, in terms of the word repetitions. We predicted to detect a mitigation of the prosodic features characterizing child-directed speech in the reunion phase (post- technoference) compared to the free play phase (pre-technoference). We found that mothers spoke faster after the technoference (reunion phase) as compared to before the technoference (free play phase), while their f0 was not particularly affected. In addition, they produced less repetitions and less words overall in the reunion phase compared to the first phase. While our results remain preliminary, they suggest an effect of technoference on the quality of speech produced by mothers, particularly mitigating some relevant features of CDS. The work discusses the risks of technoference for parent-child communication, possibly altering children's language outcomes in the long-term.

1-06: Cumulative Semantic Interference Within Social Networks: Does Naming one Group Member Slow Down Naming Others?

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In this study, we explore the Cumulative Semantic Interference Effect, typically seen when speakers name objects from the same taxonomic category in succession, resulting in increased naming latencies for each subsequent object (Howard et al., 2003). We extend this investigation to the domain of social networks, examining whether a similar interference occurs when naming members of a common social group (e.g., characters from the same TV series, pop stars, or politicians). Utilizing an online experiment conducted via SoSci Survey (cf. Stark et al., 2021), participants were prompted to type names of individuals from specified social networks and taxonomically related objects. These were presented through a mixed sequence of photos representing 12 social and 12 taxonomic categories, each with five members. Preliminary findings from a pilot study (N=18) replicated the cumulative interference effect within taxonomic categories and suggest a potential, albeit weaker, interference effect in naming social network members. With an expanded sample size of 36 additional participants, our goal is to confirm these initial observations. We anticipate documenting cumulative interference in both taxonomically related objects and socially related individuals. Our study focuses on the impact of semantic interference in social categorization, akin to its role in taxonomic classification. We aim to enhance knowledge of the psycholinguistic mechanisms across various semantic representations, and seek to bridge cognitive and social processing theories.

1-07: Dialectal and conceptual alignment during multiparty conversation: abstract priming or audience design?

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In language production, 'alignment' is a phenomenon in which the linguistic characteristics of interlocutors become increasingly similar as their conversation progresses. Several mechanisms can contribute to alignment including priming (Pickering & Garrod, 2004) and audience design (Bell, 1984). Recently, an intriguing study was presented by Cirillo et al. (2022) which found that humans who interact with a social robot align conceptually with the robot by varying the level of specificity of the target label. The authors suggested priming at the abstract level to be the mechanism responsible. Similarly, a study by Heggdal Lønes, Kamide and Melinger (2022) found that bidialectals who encounter dialect-speaking interlocutors increase their own rate of dialect words, also as a result of abstract priming. Both of these studies were set within dyadic dialogues; in the current study, we investigate whether abstract priming occurs during a three-way conversation. Within our study, abstract priming would be supported if alignment generalized across speakers while audience design would be supported if alignment were speaker-specific. Two picture matching-and-naming experiments presenting trials in an interleaved design (Trial 1 = matching; trial 2 = naming; trial 3 = matching, etc.) were conducted online. Participants worked with two confederates (on separate trials, random presentation order). On naming trials, participants selected one of four visually presented words. In Experiment 1, participants (N=111) matched and named target pictures equally nameable by a Scottish dialect word and a semantically equivalent standard English word. The confederates were 1 Scottish dialect talker and 1 standard English talker. Naming options included a Scottish dialect word, an equivalent standard English word, and 2 unrelated distractors. Lexical choice was affected by current partner, with more Scottish words addressed to the Scottish partner than the English partner overall. In Experiment 2, which followed Cirillo et al (2022), participants (N=112) matched and named the same target items as in Exp 1 at either the basic or category level. The confederates were 1 female talker who always chose the basic level name of the target and 1 male talker who always chose the semantic category of the target. Naming options included the basic name, the semantic category, and 2 unrelated distractors. Lexical choice was again affected by current partner, as participants produced more category labels when the current partner was the category label user. Thus, neither experiment shows evidence of abstract priming. Instead, audience design appears to be responsible.

1-08: Do immersive virtual reality favour lexical-sematic processing in neurotypical adult word learning and in (re)learning in post-stroke aphasia?

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Word learning is a cognitive skill used daily in adulthood to acquire new words, but also after a stroke to (re)learn to produce words. In both cases, immersive virtual reality (iVR) shows promising results. In word learning, iVR generally provides better learning outcomes than non-immersive VR (Dhimolea et al., 2022) and than other (static) digital methods (Franco et al., submitted). In anomia therapy, iVR is associated with a greater reduction in lexical (semantic) errors (Franco et al., submitted). These findings raise the hypothesis that lexical-semantic processing is improved by iVR. Lexical-semantic processing in word production is usually studied using picture-word interference (PWI) task. It involves the simultaneous presentation of a picture and a semantically related distractor, which slows down the production latency compared to a control condition. The aim of this study was to investigate whether learning/training with iVR leads to better lexical-semantic integration as targeted by PWI compared to a digital control method in neurotypical adults and people with aphasia (PWA).
In Experiment 1, 32 neurotypical adults performed a PWI after a one-week learning period on two matched lists of 30 rare words in their native language, using iVR and a static digital control method in a within-subjects cross-over design. In Experiment 2, 10 PWA performed the same task after a two-week learning/therapy period on 56 common words using the same methods.

For accuracy, results showed overall higher accuracy for the list learned with iVR than for the other list learned in neurotypical adults (chisq (1) = 27.86, $p < .001$), but not in PWA. In contrast, iVR leads to fewer lexical errors than the control method (Friedman test (1) = 4.5, $p = .03$). For reaction times, neurotypical adults revealed a semantic effect only for words learned with iVR ($t (2098) = -2.47$, $p = 0.01$). For PWA, a latency difference of 37 ms for the iVR list and 7 ms for the control list was observed, but did not reach significance, possibly due to the size of the group.
Results suggest that learning with iVR leads to better learning and faster lexical-semantic interference effects than a static digital method. For PWA, treating words with iVR leads to fewer lexical-semantic errors and the 37 ms effect in the PWI on the word list learned with iVR, although not significant, may suggest better lexical-semantic integration, as meta-analyses on the PWI found a 21-ms effect (Bürki et al., 2023).

1-09: Does self-correction induce contrastive stress?

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During speech, prosody serves several functions including signaling rhythm, intonation, and stress structure. Stress is crucial for highlighting salient information in contrast to background information-e.g., emphasizing novelty or contrasting with previously given information. This project explores the timing of focus planning. Our initial focus is on prosodic prominence-the relative emphasis on certain words during speech. Prosodic prominence affects meaning in terms of importance, contrastive information, or novelty. We plan to compare a ”prosody first” (Keating & Shattuck-Hufnagel, 2003) and a ”prosody last” model (Phonological Encoding model proposed by Levelt, 1989). The first claims that prosodic structure is built on syntactic information before phonological encoding, while the latter claims that the prosodic components are added on top of the phonological encoding.
We will use speech reparation to test the timing of prosodic prominence planning. The speech repairs will be such that they require a different prosodic structure than the original utterance. If prosodic prominence is planned during the last stages of speech planning and production, utterances should carry appropriate prominence markers regardless of repairs. If planning happens during earlier stages, late repairs would not be corrected in time, inducing inappropriate prominence. To address this, we will test Dutch speakers in a visual change naming paradigm. Participants will name sets of two images: one on the left and one on the right. Naming will occur using a standardized structure: ”Dit is een (adjective) (noun).” The adjective refers to the colour, and the noun to the shape (e.g., ”Dit is een blauwe fiets.”; this is a blue bike). The image on the right will either present a contrast that needs to be marked or not. The second image will then change in some cases, once the participant crosses an invisible visual barrier (after a 300 ms delay) to induce repairs (participants must abandon the utterance and name the new object). These repairs will either remove the contrast that was created or create a new contrast. We will compare the noun phrases on intensity (dB), pitch (Hz), and duration (ms) (Bögels et al., 2011). If repairs show the prominence characteristics expected for the original utterance, we will provide support for a ”prosody first” strategy. If, instead, they align with those predicted for the repair, this will support a ”prosody last” strategy. Data collection is ongoing, with results expected by mid-May.

1-11: Establishing stuttering instruments for Arabic Children Who Stutter, CWS I. Phonological complexity in Disfluent Speech

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Widely-used instruments such as SSI-4 (Riley, 2009) do not take into account the structural features of Arabic. Currently, no tool is available for assessing fluency in Arabic even though calls have been made for clear symptom-definition and assessment procedures when studying stuttering in languages other than English (Howell & Rusbridge, 2011). As a first step, the goal here was to develop a scheme for the analysis of Arabic stuttered speech based on the Arabic Index of Phonetic Complexity (AIPC; Al-Tamimi et al., 2013). The AIPC assays difficulty of words based on the phonetic factors they possess, and the measures are then used to gauge susceptibility to likelihood of word being stuttered. We hypothesized that stuttered words would have higher AIPC scores than fluent control-words.
Method. Five children diagnosed with stuttering by an SLP produced 200-300 syllables in spontaneous conversation. Recordings were orthographically transcribed offline. Words were coded as fluent or stuttered and stutters were designated as repetition, prolongation, or break. The grammatical class of words was also coded. Fluent words from the same grammatical class and with the same number of syllables as the stuttered words were selected at random for control. AIPC scores were obtained by summing up the number of phonological factors within each word.

Results. Paired-sample T-test showed stuttered words had higher AIPC scores (M = 2.05; SEM =.1) than controls (M = 1.46; SEM = .1).

Discussion. The higher AIPC scores of stuttered words is consistent with previous findings (Al-Tamimi et al., 2013). A tentative conclusion is that Arabic words with specific phonological characteristics pose more difficulty and therefore attract more stuttering. This establishes the phonetic parameters associated with difficulty that leads to stuttering in Arabic. The next goal is to establish a valid formula that can combine lexical types and phonological complexity into an overall severity score. Data collection is ongoing and results from more children will be presented at the conference.

1-12: Exploring Preposition Priming in Late L2 Acquisition: Cross-Linguistic Structural Priming in Artificial Languages

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Structural priming refers to the implicit activation of linguistic information at both the lexical and syntactic levels in the mind, which can influence subsequent linguistic behaviors (Pickering & Ferreira, 2008). In a seminal experiment by Levelt and Kelter (1982), the effect of lexical persistence at the preposition level was demonstrated through a simple telephone scenario ("At what time does your shop close?"). However, little is known about priming at the written prepositional level, where the recycling of a preposition in text-based contexts, might shape subsequent linguistic behavior. In this study, we employ an artificial language constructed based on Frisian language, involving 120 Dutch-speaking undergraduate students from Ghent University. Our aim is to explore whether prepositions can be primed in text-based contexts and determine whether such priming facilitates the acquisition of new vocabulary. We examined three data sources: (1) analysis of written text for reused prepositional phrases, (2) keylogging time during responses as a measure of attention, and (3) pretest-posttest comparisons to assess the impact of priming on vocabulary learning. The results unveiled (1) a significant priming effect at the prepositional level, (2) the potential of priming to enhance lexical acquisition, and (3) a non-significant influence of attention on priming. The implications and findings are discussed.

1-13: Does prediction drive neural alignment in conversation?

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Recent studies on neural alignment in language (i.e., brain-to-brain synchronisation between interlocutors) have shown that successful communication relies on the synchronization of the same brain regions in both speakers. However, more explicit mechanistic links between neural alignment and specific linguistic functions of the communicative signal remain to be established. This project relies on the hypothesis that the degree of neural synchronization between interlocutors depends on the degree of predictive processing: the more predictability between speaker and listener, the more their brain responses will align and display similar oscillatory dynamics (Pickering & Gambi, 2018).
We are testing this hypothesis by isolating word semantics (e.g., animal vs. tool word category) in an experimental set-up where (a) prediction effects are tested at the behavioral level; (b) brain activity (EEG) of two interlocutors engaging in simple conversations is recorded simultaneously and analysed in an event-related fashion (i.e., at the word component level instead of the whole communicative signal).

Experiment 1 presents a novel interactional task where participants are involved in an association game where speaker A names a picture (either an animal or a tool) and speaker B needs to respond with a semantically related word. Importantly, the predictability for the upcoming object is manipulated, i.e., prior to picture naming, participants hear either a highly predictable or non-predictable sentence up to the final word, which is then finished by speaker A naming an object. The analysis of speech onsets showed a significant reduction of response latencies in the predictable condition, both for speaker A and speaker B.

In Experiment 2 participants are playing the same association game but without predictive priming. The relevant factor to explore now is whether we can find meaning-specific brain-to-brain synchronisation between tools vs. animals brain regions, which is the defining dimension by which participants need to perform the task. While we have no control about the exact words that an interlocutor will reply, we do control the semantic categories of the words, and therefore, this allows us to explore whether we can find brain-to-brain synchrony for specific word meanings (instead of for 'language' in general).

Experiment 3, also a dual EEG set-up, tests the hypothesis that this co-activation is more in synchrony when semantic predictions have primed the target word.

References:
Pickering, M. J., & Gambi, C. (2018). Predicting while comprehending language: A theory and review. Psychological Bulletin, 144(10), 1002–1044

1-15: Influence of rhythmic background on handwriting in 2nd and 5th Graders

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Numerous studies have reported benefits of music listening to support motor and language learning. In the case of writing, previous studies suggested that musical background improves graphomotor speed and fluency. Whether this benefit is specifically related to the rhythmic cues provided by the music or comes from the melody remains to be established. In addition, music can influence handwriting differently depending on the child's level of expertise. To disentangle the effects of rhythm and melody according to the level of writing expertise, we recorded graphic movement under different sound backgrounds in two groups of different grades.
Forty-four 2nd Graders and forty-four5th Graders had to trace loops and to copy isolated words under four sound conditions: silent, melodic without metronome, melodic with slow metronome (1.6Hz), and melodic with faster metronome (2.2 Hz). Handwriting proficiency was also assessed using a standardized test.
The results revealed that listening to a pure melodic background reduced the writing mean velocity, fluency, and loop size in both groups. In addition, the presence of a rhythmical background influenced handwriting kinematics, but this effect was modulated by the grade and the task: for the younger group, the two rhythms, and especially the slow rate, increased the loop tracing speed, whereas for the words, the speed and fluency were deteriorated by the fast rate. On the reverse, in the older group, the two rhythmic conditions had a detrimental effect on writing speed, fluency, and product quality (i.e. increased size) of both the loops and the words. Finally, the effects also depend on handwriting level: poor writers seem to beneficiate more from the adding of rhythmic cues. These results raise interesting perspectives for learning to write and for the rehabilitation of developmental dysgraphia.

1-16: Investigating lying and truth-telling in a socially interactive game

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Lying, the intentional attempt to convince another person of something the speaker knows to be untrue, is an intriguing means of communication. Here we present a novel paradigm allowing us to investigate lying, truth-telling and contextual influences in a socially interactive, browser-based setting. Participants engaged in a picture-naming game with a simulated task partner. In some trials, they were encouraged to lie strategically and freely chose to type the name of an associated card instead of the card shown to win additional points–but only if the lie went undetected by the opponent. Response times (RTs) were compared to a non-social control condition with instructed naming of the shown and associated card. Across three experiments (total N=118), we demonstrated the applicability of the paradigm: Participants were willing to believe they were playing with another person and produced a relevant number of lies and truths. As expected, they were slower to lie than to tell the truth, but both motivation (the opportunity to win points) and intention to deceive (having a low-value card) affected RTs independently and in interaction. Surprisingly, the social lying context led to a relatively stronger slowing of truth-RTs than lie-RTs, as shown by the comparison with the control task. Experiment 2 replicated these findings and showed that the RT differences were robust to semantic context effects: Although participants were faster to produce a lie that was semantically related than a lie that was not related to the truth (e.g., skirt and pants vs. skirt and fork), the RT-differences from Experiment 1 were generally unaffected by semantic similarity. Finally, Experiment 3 showed that all observed differences occurred even when the memory load was reduced. Taken together, these results underscore the robustness of RT slowing in verbal lying against variations in cognitive load and semantic relatedness. Moreover, they highlight that truth-RTs are no less susceptible than lie-RTs to the social deception context and its motivation and temptation to deceive. Response duration and (semantic) errors provide further insights into the dynamics of the cognitive processes involved.

1-17: Investigating the Mechanism underlying Self-Monitoring in Inner and Overt Chinese Word Production

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Word production is a complex process, and self-monitoring plays a crucial role in detecting and correcting errors before and during actual articulation. However, how the monitoring occur is still in debate. The Perceptual Loop Theory posits that inner and overt speech are monitored through the speech comprehension system. Previous research has shown English words production was monitored through phonological comparison. However, whether this discovery holds cross-linguistic consistency is still unclear.
Using similar stop-signal paradigm, we chose Chinese, which is a morphosyllabic language and the writing system is different from English, as the target language to test the language universal hypothesis in speech monitoring. During the task, participants were instructed to name pictures and occasionally to halt speech when the auditory (Experiment 1) or visual (Experiment 2) signals did not match the picture name. Stimuli varied in semantical or phonological similarity/dissimilarity to the intended word of the picture to be named. The auditory/visual signals were used to manipulate overt/inner speech monitoring. Stopping accuracy was selected for data analysis.

Results revealed both auditory and visual signals showed main effect of phonological similarity, with more errors in phonological similar trials than in other trials. In contrast, only visual signals showed a significant effect of semantic similarity, with more errors in semantically similar trials compared to other trials. However, no interactions were found in either experiment.
Our findings indicate that overt speech monitoring and inner speech monitoring showed divergent mechanism, with overt speech monitored by phonological comparation, which was consistent with findings in alphabetic languages; but with inner speech monitored by phonological and semantic comparison separately, which was unique in Chinese. The divergent findings may be attributed to unique writing system in Chinese, where Chinese characters don't strictly follow the orthography-phonology correspondence rule, and visual presented Chinese words need more semantic involvement to form the conceptual representation in speech monitoring system. The cross-linguistic evidence could contribute to refining comprehension-based monitoring theories and advancing our understanding of self-monitoring mechanisms.

1-18: Is the availability of the production system critical for lexical prediction in a second language?

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Recent research suggests that language prediction during comprehension relies on the production system: while comprehending, readers and listeners engage some of the mechanisms used in language production to anticipate upcoming linguistic input (Pickering & Gambi, 2018). This claim is supported by the fact that the production system needs to be available in order to generate predictions at the lexical level (Martin et al., 2018). However, bilingual speakers typically lack experience producing their second language (L2), which may affect their ability to recruit the production system to form L2 predictions. The present study investigates whether the production system needs to be available to form lexical predictions during L2 comprehension, similarly to first language (L1) comprehension. Spanish-French bilingual speakers are asked to read highly constrained sentences ending in a predictable or unpredictable noun-phrase, in both L1 and L2, and during electroencephalography (EEG) recording. While reading, participants perform a secondary task that blocks their language production system (articulatory suppression by syllable production) or not (tongue tapping; see Martin et al., 2018). Event-related potentials (ERPs) elicited by target words in sentences will be extracted from EEG recording. The amplitude of the ERP N400 component is expected to be larger when reading an expected article and noun than unexpected ones, within the critical noun-phrases (N400 effect; DeLong et al., 2005). The magnitude of the N400 effect elicited by predictable and unpredictable articles and nouns will be compared across conditions (production system blocked or not) and languages (L1 and L2). We hypothesize that prediction will rely on the availability of the production system in the L1 (Martin et al., 2018), but not as much in the L2. Therefore, we expect that blocking the production system will have a bigger impact for L1 prediction than for L2 prediction. These preliminary results will show whether the mechanisms at play for lexical prediction can be extended to the multilingual population and provide a key perspective on second language prediction.

References:

DeLong, K. A., Urbach, T. P., & Kutas, M. (2005). Probabilistic word pre-activation during language comprehension inferred from electrical brain activity. Nature Neuroscience, 8(8), 1117-1121. DOI: 10.1038/nn1504

Martin, C. D., Branzi, F. M., & Bar, M. (2018). Prediction is Production: The missing link between language production and comprehension. Scientific Reports, 8:1079. DOI: 10.1038/s41598-018-19499-4

Pickering, M., & Gambi, C. (2018). Predicting while comprehending language: A theory and review. Psychological Bulletin, 144(10), 1002-1044. DOI: 10.1037/bul0000158

1-19: Lexical alignment is greater to interlocutors who demonstrate poor comprehension during conversation

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Lexical alignment occurs when producers adapt their word choice to match their interlocutor's. We explore whether alignment is driven by a producer's belief in its communicative utility, by investigating how much people lexically align to an interlocutor based on their demonstrated comprehension abilities during conversation.
In two experiments, an interlocutor named groups of pictures while the participant matched; then the participant named the same pictures back. After each picture the participant named, the interlocutor either successfully understood and selected the correct picture, or did not understand and produced an error message. The pictures could be described with two acceptable names in American English, one dominant (e.g., couch) and the other secondary (e.g., sofa), determined in a pilot experiment (N=80). The interlocutor always produced the secondary name.
In Experiment 1 (N=120), the interlocutor was an automated chatbot. In Experiment 2 (N=120), the interlocutor was allegedly human; in reality, it was the identical chatbot as in Experiment 1, but with a few human-like behaviors (e.g., a delay before responding).
The between-participants Comprehension Ability condition dictated the interlocutor's responses to the participant's word choice: (1) the interlocutor only understood words it produced; (2) the interlocutor understood words it produced plus the dominant synonym; (3) 50/50 probability of understanding each word.
Speakers significantly aligned to both interlocutors in all three Comprehension Ability conditions, compared to a control where participants were not exposed to the interlocutor's preferred words (all $z > 5.5$, all $p < .0001$). Participants aligned more when they learned during the conversation that the interlocutor had poor comprehension ability (Condition 1) vs. good comprehension ability (Condition 2), both when the interlocutor was a computer (76.4% vs. 66.5% alignment; $z=2.4$, $p < .04$) and when the interlocutor was "human" (64.5% vs. 47.8% alignment; $z=3.7$, $p < .0006$). Participants also aligned more overall, across Comprehension Ability conditions, when interacting with a chatbot (59.2% alignment) than a "human" (47.7% alignment) interlocutor, despite identical conversational behavior between the two interlocutors ($F=20.3$, $p < .0001$).
These results demonstrate that language producers (a) modulate their lexical alignment based on contemporaneous conversational feedback about how well their interlocutor comprehends non-aligned language, and (b) align more to interlocutors who they expect to have lower comprehension ability based on personal characteristics. These results support the hypothesis that alignment is driven (partly) by communicative utility, and people align more when they receive online conversational evidence that alignment will improve the likelihood of communicative success.

1-20: Longitudinal effects of deep brain stimulation on spontaneous language production in people with Parkinson's disease

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Introduction: Parkinson's disease (PD) is characterized by a range of motor (Jankovic, 2008) and non-motor symptoms, including executive dysfunctions and language difficulties (Lowit et al., 2022). Bilateral deep brain stimulation (DBS) of the subthalamic nucleus (STN) can be a long-term effective treatment for medication-refractory motor fluctuations (Limousin & Foltynie, 2019). Insights regarding the effects on spontaneous language production are increasing, for example through studies comparing performances ON and OFF DBS at a specific moment after surgery (Batens et al., 2014; Ehlen et al., 2020; Tiedt et al., 2021). However, an understanding of longitudinal effects remains limited (Vos et al., 2021). In this context, Zanini et al. (2003) observed a reduction in morphosyntactic errors during spontaneous language production two to three weeks after (compared to before) surgery in 4 people with PD. This result remained stable up to 1 year after surgery. Findings for the total number of produced words were variable.
Method: Seven individuals with PD (5 men and 2 women; mean age = 60.3 years, SD = 7.73 years) performed a spontaneous language production task before the bilateral implantation of electrodes in the STN, as well as three, six and twelve months after DBS surgery. The language samples from semi-standardized interviews were analyzed according to a standard procedure (Analysis of Spontaneous Speech in Aphasia, Boxum et al., 2010), and results were compared to a normative dataset (van der Scheer et al., 2011).
Results and discussion: Lexico-semantic and morphosyntactic characteristics of spontaneous language production were affected by bilateral STN DBS, although the pattern of results was characterized by a high inter-individual variability. A prominent finding was a reduction in the total number of nouns (4/7, 57.1%) and the percentage of correct sentences (6/7, 85.7%) at three or six months after DBS surgery (with bilateral STN stimulation) compared to before surgery. Interestingly, the majority of patients showed a (trend towards) recovery for these linguistic parameters (amount of nouns: 3/4, 75%; percentage of correct sentences: 5/6, 83.3%) 12 months after surgery. These results partially correspond to the findings of Zanini et al. (2003). Inter-individual differences in DBS settings and dopaminergic medication intake possibly contributed to the variable course of spontaneous language production in people with PD after STN DBS surgery (Batens, 2016).
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1-21: Modeling evidence for non-competitive lexical selection in serial and sentence-final cloze

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Competition during lexical selection may shape the speed and fluency of production (Oppenheim, 2023, psyarxiv; Staub et al., 2015, Journal of Memory and Language). Critically, fluency in a non-competitive production system should be insensitive to the specific activation of other responses. Here, we assess this proposal in analyses of three cloze datasets, as the task can be seen as explicitly competitive from a task demand perspective (i.e., producing "the best continuation of the sentence" requires comparing different potential continuations). Through analyses of reaction times, cloze probabilities, and large language model outputs, we find evidence that lexical selection is a non-competitive process.
First, we find that the log odds of a cloze response (Balatsou et al., 2022, Cognition) strongly predicts reaction time for serial cloze responses in sentences varying in final-word predictability (Federmeier et al., 2007, Brain Research). We find that speed is not affected by the number or strength of activations of other responses, instead reflecting only that word's activation relative to all others. We also find that outputs of a statistical LM (log-odds probabilities generated from GPT-2), which are generated purely by spreading activation with no competitive mechanism, correlate with naming latencies. Surprisingly, when a word belongs to a likely semantic category, production is even faster. Thus, rather than competing with each other, lower-probability words may facilitate language production.

Next, we tested whether this effect would replicate in both large-scale serial (Luke & Christianson, 2016, Cognitive Psychology) and sentence-final (Peelle et al., 2020, Behavior Research Methods) cloze tasks. GPT-2 log-odds and cloze log-odds strongly correlate for both datasets (ρ=0.72; ρ=0.53, respectively), demonstrating that spreading activation alone can give rise to cloze probability, which is further suggestive of a non-competitive race model.
Therefore, these results suggest that both sentence-final and serial cloze production tasks rely on non-competitive language production mechanisms, generalizing previous findings and experimental paradigms while providing large-scale support for previous proposals.

1-22: Navigating Pronoun Use in Primary Progressive Aphasia: A Tale of Two Variants

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Primary progressive aphasia (PPA) is a neurocognitive syndrome characterized by language impairments resulting from focal brain degeneration affecting the language network (Mesulam, 2001). In connected speech, use of pronouns is often found to be within norms of neurotypical controls in the non-fluent variant of PPA, whilst they are overused in the logopenic variant (Wilson et al., 2010). However, elicited sentence-level pronoun production has not been well studied in PPA. By assessing pronoun processing through this paradigm, we can distinguish potential difficulties in pronoun processing from those observed in connected speech, where individuals with PPA frequently employ pronouns as compensation for word-finding difficulties. The current study explored elicited pronoun production in two cases of individuals with PPA (A01, 84-years-old, non-fluent variant; A02, 69-years-old, logopenic variant) and compared their performance to groups of young (N = 31, M age = 19 years) and senior (N = 24, M age = 68.8 years) neurotypical controls. We administered a pronoun elicitation task using 120 sentence contexts in English across two conditions: reflexives and object pronouns (e.g., The astronaut scratches herself/her). Gender of pronouns was counterbalanced across conditions. Prior to each trial, two visually depicted human characters were introduced on the screen (e.g., This is an astronaut. This is a teacher). Subsequently, participants saw a depiction of an event (e.g., an astronaut scratching a teacher) and heard the description of the picture (i.e., Here the astronaut scratches the teacher). Following these prompts, they were presented with the target visual (e.g., an astronaut scratching herself with the teacher standing next to the astronaut) and were asked "What does the astronaut do here? She scratches__". Spoken responses were audio recorded and transcribed before analysis. Analyses on voice onset times (VOT) are currently underway. Controls' response accuracy was high with a significant effect of condition, indicating more accurate performance in the pronoun than the reflexive condition. When analysing the two age groups separately, the effect of condition was significant only in the senior group (senior controls: pronouns 94.94%, reflexives 81.88%; young controls: pronouns 97.37%, reflexives 96.83%). A02 performed highly accurately in the pronoun (100%) and reflexive conditions (93.3%). In contrast, A01 performed at floor in both conditions (5%, 0%). A02's performance was within control norms for both reflexives and pronouns while A01 had severe difficulties in both conditions, in line with grammatical perturbations in this PPA variant.

1-23: Older adults adapt their lexical choices based on their beliefs about their interlocutor's age

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Effective communication requires speakers to adapt by reusing (entraining to) their conversation partner's lexical choices, even if those words are not usually favored (e.g. using "spectacles" over "glasses"). Adaptation may also include maintaining these disfavored words with future partners. While our preliminary research has shown that lexical entrainment and maintenance increase with age, little is known about the cognitive mechanisms driving these differences. The present (OSF-preregistered) research explores age-related effects on lexical entrainment and maintenance during dialogue, specifically how these are influenced by speakers' age and their beliefs about partners' ages.

Experiment 1 employed a 2(Participant's age: old, young) X 2(Partner 1's age: old, young) X 2(Partner 2's age: same as Partner 1, different) design. 160 older (60-79 years old) and 160 younger (18-39 years old) adults played two sessions of an online picture-matching-and-naming task with different (actually computer-simulated) partners in each session. Participants learned about both partners' ages at the start of the task. Entrainment was measured as participants' tendency to reuse disfavoured terms used by Partner 1 in session 1; maintenance was measured as participants' tendency to reuse entrained terms with Partner 2 in session 2. Older speakers were significantly more likely to entrain and maintain disfavoured terms than younger speakers (entrainment: 57%(30%) vs. 28%(26%); maintenance: 46%(32%) vs. 18%(22%)). Crucially, while younger speakers' entrainment and maintenance was not affected by their beliefs about either partner's age, older speakers' entrainment was significantly influenced by both partners' ages. Older adults were more likely to entrain to an older than a younger Partner 1 (64%(30%) vs. 50%(30%); z=-2.11, p=.03). They also entrained more often to Partner 1 when anticipating later interaction with Partner 2, who is of the same-age-group than different-age-group of Partner 1 (63%(30%) vs. 52%(30%); z=-2.66, p=.008), suggesting a preparatory strategy for future interactions.

Experiment 2 replicated the effect of Partner 1's age on older adults' entrainment with another group of 160 older adults, and found null effects of Partner 2's age on entrainment when this information was undisclosed during session 1, confirming our earlier finding indeed reflects effect of the second partner's age (and was not due to measurement error).

These results suggest that older (though not younger) speakers are sensitive to their partner's age, adapting their language use to accommodate both present and anticipated future interactions, supporting audience design effects in older adults' entrainment. We also discuss other potential explanations, including age-related differences in executive functions.

1-24: Phonewriting: the impact of word suggestions on orthographic processing

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The popularization of smartphones has revolutionized communication. People nowadays communicate primarily through their phones. They dedicate significant portions of their time to this form of writing rather than traditional methods like handwriting or typing on a desktop keyboard. Writing on a smartphone implies a new way of processing orthographic information due to the implementation of word suggestion systems. Spelling retrieval is no longer a mere recall of information on the letter components of a word. While writing the first letters, smartphones suggest words on top of the virtual keyboard to complete the target word before we write the last letters. This back-and-forth mechanism of writing letters, reading word suggestions, and selecting one of them, modifies the way we process orthographic information during word writing. In the present study, we focused on how word suggestions modulate word writing in phones. A spelling to-dictation task was administered to a group of 55 native monolingual French speakers (18–30 years old). The participants wrote French words in two conditions: with or without word suggestions on the top of the virtual keyboard. We manipulated also orthographic consistency (consistent vs inconsistent) and word length (5, 6, 7, 8 letters). The results revealed that word suggestions were used more often to write inconsistent long words. Furthermore, the participants rarely use word suggestions to write short words. For the latter, it seems as though the cognitive load to read and select the word suggestions is higher than the benefits. In addition, we found that the presence of suggestions decreases the number of errors only for inconsistent words, especially when they are long. Using word suggestions also decreases the number of online corrections in long words. The use of word suggestions didn't increase the total writing duration. Further analyses on online measures will better clarify the dynamics of orthographic processing in phonewriting with and without suggestions.

1-25: Planning strategies in grammatical encoding: Behavioural and electrophysiological evidence from Mandarin Chinese

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A growing consensus among researchers suggests that, in sentence production, the planning scope of grammatical encoding is relatively flexible, influenced by both linguistic and non-linguistic factors. The current study investigated whether there is a consistent planning unit-be it a word, a phrase, or a clause-or if there is variability, with speakers adopting different strategies depending on the production task. We focus on how speakers plan sentences in the face of varying syntactic structures and lexico-syntactic features. We adopted a picture-description task (e.g., ”The banana and the rope are above the envelope” vs. ”The banana is above the rope and the envelope”) with the syntactic structure of the target sentences and the congruency of the lexico-syntactic classifier features of the first two nouns as two independent variables. Behavioural results showed that participants were faster producing target sentences beginning with a conjunction NP (e.g., ”the banana and the rope”) as compared to a simple NP (e.g., ”the banana”). Amplitudes of the ERP P3b component, reflecting cognitive load, were larger when target sentences began with a simple NP compared to a conjunction NP. Besides, an interaction in the ERP data suggested that the congruency of lexico-syntactic features within the sentence mediated the effect of syntactic complexity and cognitive load triggered by the complexity. Our findings indicate that participants adopted distinct planning strategies to plan target sentences with different syntactic structures. In conclusion, the study supports the view that the planning scope of grammatical encoding is rather flexible and can be affected by linguistic factors. Our results also suggest that the activation of lexico-syntactic features in sentence production is task-dependent.

1-26: Processing of Visual Shape Information in Chinese Classifier-Noun phrases

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Previous studies have employed the picture-word interference paradigm to validate that classifiers associated with nouns were activated as lexico-syntactic features during lexical access of Chinese nouns. However, there are many subcategories of classifiers, among which shape classifiers possess a certain degree of specificity due to their inclusion of shape information. This study aimed to investigate the processing of visual shape information of classifiers during the production of classifier-noun phrases by native Chinese speakers. Thirty-six participants engaged in a picture-naming task using the blocked cyclic naming paradigm. Thirty-six pictures, comprising eighteen flat objects and eighteen long objects, each associated with a specific shape classifier, were selected as targets. The target pictures were arranged into twelve triplets according to classifier congruency and shape similarity. The triplets with different combination orders formed three experimental conditions: classifier and shape congruent condition (C+S+), classifier incongruent and shape congruent condition (C-S+), and classifier and shape incongruent condition (C-S-). Each triplet was repeated eight times to create a block, and participants were instructed to name the pictures in each block using the format ”number + classifier + noun.” Voice responses and EEG data were recorded. Preliminary behavioural results revealed a significant difference in response times between C+S+ and C-S+ conditions, with slower reaction times when classifiers were incongruent within each naming block. A significant difference was observed between C-S+ and C-S- conditions, with slower reaction times when object shapes were similar. Mass univariate analysis of EEG data revealed significant differences in amplitude across three conditions at 300 to 400 ms and 500 to 800 ms post-stimulus onset. Specifically, during these two time windows, the C-S+ condition elicited more positive voltage compared to the C+S+ condition, while the C-S- condition showed more negative voltage compared to the C-S+ condition. These findings suggested that visual shape information affected noun phrase production. Keywords: speech production, lexical access, blocked cyclic naming, shape interference effect, Mandarin Chinese

1-27: Response modality switching reveals short-term interplay between speaking and typing

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To determine the extent of shared representations and processing between the spoken and written modalities, we examined short-term interactions between speaking and typing through a novel response modality switching paradigm. While speaking relies mainly on phonological representations, typing most likely requires the activation of both orthographic and phonological representations. Our starting hypothesis was that the asymmetry in activation of orthographic and phonological representations between modalities should be reflected in asymmetrical switching costs.

Forty-nine participants went through a picture naming task. A color frame around each picture indicated whether naming had to take place through speaking aloud or typing on a keyboard, with response modalities alternating pseudo-randomly between trials. Target items consisted of items repeated in consecutive trials, named across modalities (i.e., switch trials, e.g., (1) ”cat” spoken, followed by ”cat” typed) or within modalities (i.e., repeat trials, e.g., (2) ”cat” typed, followed by ”cat” typed). We included control items that were also named by switching/repeating modalities, but were not repeated across consecutive trials (e.g., (3) ”dress” spoken, followed by ”cat” typed). Following typical analysis in task-switching, we filtered correct trials and examined modality switching costs, i.e., the difference in reaction times between repeating vs. switching response modality (1 vs. 2). The contrast between target and control items allowed assessing cross-modality priming, i.e., the difference in reaction times between repeating or not a word when switching modality (1 vs. 3).

We observed significant modality switching costs (longer RT on switch than repeat trials), a modality effect (longer RT in typing than speaking), an item repetition effect (shorter RT on repeated than non-repeated items), and a significant interaction between item repetition and switching condition. When items were repeated, we observed similar switching costs in both modalities. When items were not repeated, switching costs were observed in speaking, but not in typing. A subset analysis on switch trials revealed significant cross-modal priming: repeating items across modalities shortened RT. This effect interacted with modality, such that cross-modal priming was larger in speaking than in typing: typing primed spoken production more than spoken production primed typing.

The expected asymmetry between modalities was found on cross-modal priming rather than on switching costs. The interaction of switching cost with item repetition suggests that shared lexical activation modulates how inhibition is applied to each response modality.

1-28: Semantic richness and prototypicality effects of the lexical-semantic network on Tip of the Tongue states

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All speakers have experienced a Tip of the Tongue (ToT) state when trying to retrieve a specific word. According to the ToT hypotheses, this might be explained either by a transmission deficit (Burke et al., 1991) from the lexical to the phonological level or by the difficulty to inhibit the competing words of the target word in the mental lexicon (Brown, 1979). However, this phenomenon could also be investigated using a different approach i.e. the network perspective (Baronchelli et al., 2013).This perspective considers other factors, such as the semantic richness and prototypicality (the type of semantic relation) of the word network, which could influence word production.

The aim of the present study is to investigate whether the lexical-semantic network in young neurotypical adults is weaker in terms of semantic associates and less prototypical at the moment of a ToT state than for an accessible word. To this end, 46 neurotypical adults performed a picture-naming task (80 infrequent words), followed by a continuous free word association task on each word that triggered a ToT state or that was correctly retrieved. In the continuous free word association task, participants say all the words that come to mind in relation to a target word for a limited period of time (De Deyne & Storms, 2008), here 10 seconds.

Overall, the task elicited 42% of ToTs. In terms of the richness of the lexical-semantic network, results showed that participants gave more associates when they had direct access to the word than when they were in a ToT state ($X2(1) = 19.58$, $p < 0.001$). In terms of prototypicality, participants gave more superordinate associates when they had direct access to the word ($X2(1) = 7.63$, $p = 0.005$) than when they were in a ToT state. Nevertheless, participants produced more coordinate words in a ToT state ($X2(1) = 12.15$, $p=0.000$) than when they knew the word. No significant differences were found for the other categories. Moreover, the associates given were more heterogeneous across participants for the ToT words than for the accessible words ($X2(1) = 6.30$, $p = 0.012$). These results show that the organisation of the lexical-semantic network of words changes depending on the ability to access the word at a given time, specifically in terms of richness at the coordinate and superordinate levels.

1-29: Sensitivity to argument roles in verb production

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This study investigates whether argument roles are effectively used in verb retrieval processes. Previous comprehension studies have shown that people initially respond similarly to verbs in role-appropriate and role-reversed contexts: ...which customer/waitress the waitress/customer served, suggesting a predictive mechanism that is slow at using argument roles in verb generation. Conversely, speeded cloze studies show that people rarely produce role-inappropriate verbs as cloze responses, unless those verbs are presented as distractors, in which case errors increase dramatically. This points to the possibility that role-insensitivity arises from processes that occur after a verb is confronted, rather than solely from processes that occur before the input. Comprehension measures make it difficult to tease these apart. Here, we test role-sensitivity in post-confrontation processes using a cloze interference paradigm, comparing how role-appropriate and -inappropriate distractors affect verb production.
Native English speakers on MTurk (N = 60) read sentence fragments presented in RSVP and produced cloze completions under time pressure. Immediately before producing a cloze response, they saw one of the following verb distractors: i) strongly associated but role-inappropriate (served), ii) weakly associated but role-appropriate (hated), or iii) unrelated (thrown). The role-reversal and weak distractors were matched in cloze probability (.05), ensuring that any differences in production rates will be due to post-confrontation processes rather than predictive processes. Response rates and onset latencies were measured.

When participants saw an unrelated distractor, they rarely produced it as a cloze response (9%), nor did they produce the reversal or weak verbs (3%). Reversal errors increased to 31% with reversal distractors, and importantly, this was comparable to the increase in weak verb responses following weak distractors (39%). Item-wise analyses indicated that both types were produced more often when the context was less constraining, indicating confrontation has a greater impact when the context alone fails to elicit a strong candidate. The reversal and weak distractor RTs were equally faster than unrelated distractor RTs.
The results indicate that processes that occur when a verb is confronted during generation are not highly sensitive to argument roles. Role-reversal distractors elicited a comparable amount of distractor responses as role-appropriate distractors matched in predictability, indicating that confronting a role-reversal can elicit many role-inappropriate responses even though they are not generated in absence of the bottom-up input. This in turn suggests the possibility that role-insensitivity is partly driven by processes that occur after a verb is encountered, rather than solely from faulty predictive processes.

1-30: Sign Language Vocabulary Learning: Uncovering Fast Cross-Language Interactions Between Signs and Words

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In an EEG study, we investigated neural changes underlying early stages of sign language vocabulary learning. Hearing adults that learn a sign language represent a special case in L2 learning since the acquisition of new vocabulary involves a different language modality (second modality-second language -M2L2- learners). Perceptual and articulatory channels involved in oral languages (in written or spoken format; auditory-vocal) are different from those involved in sign languages (visual-manual).
To that end, in a longitudinal experiment spanning three sessions within a week, we collected behavioural and ERP measures to explore the rapid connections formed between newly acquired lexical entries of sign languages and those well-established lexical representations in the oral language.

In three sessions, participants, who were Catalan-Spanish bilinguals unfamiliar with Catalan Sign Language (LSC), engaged in a learning task, followed by a cross-modal (oral-sign) translation task. In the learning task, participants were presented with LSC signs along with their corresponding Catalan translations. In the a cross-modal translation task, participants were asked to translate learned LSC signs into Catalan. Target signs were proceeded by prime words written in Catalan or Spanish. Crucially, written primes were phonologically related trough LSC translation with the LSC target or phonologically unrelated.

Participants were faster and more accurate through learning sessions. In addition, priming effects, with unrelated word-sign pairs being slower than related word-sign pairs, increased with session, revealing that participants were more sensitive to the links between the oral and signed language.

At the electrophysiological level, N400 effects were observed in the second session for Catalan distractor words, primarily at central sites. In the third session, there were observed N400 effects for Catalan and Spanish distractor words, particularly, localized at anterior sites.
These results provide further insights into the cognitive processing dynamics associated with lexical integration. The observed behavioral and electrophysiological patterns shed light on the mechanisms underlying the rapid connections formed between lexical entries of sign languages and oral languages during the initial stages of sign language vocabulary acquisition. Furthermore, from a broader perspective, they provide preliminary insights into the transfer of initial lexical links between two languages to a third language.

1-31: Speech motor planning in monosyllabic and disyllabic pseudoword production

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Speech planning processes include the retrieval of motor codes from a mental store. Some psycholinguistic models have proposed the syllable to be the functional unit explicitly represented in such centre of storage, also called syllabary (Levelt, Roelofs, and Meyer, 1999). Although many studies have brought evidence suggesting that speakers in fact retrieve stored syllabic units (e.g. Carreiras & Perea, 2004; Cholin, Levelt, & Schiller, 2006), it remains unclear how the syllabic retrieval is achieved during the production of multisyllabic utterances. More specifically, are all syllables retrieved in advance before actual production begins, or is only the first syllable retrieved prior to its production while subsequent syllables are planned during the articulation of the initial syllables? To unravel these mechanisms, in the present study we examine the brain dynamics underlying the production of monosyllabic and disyllabic pseudowords (i.e. /pra/ or /prati/, respectively) by means of electroencephalography (EEG). In order to target speech planning processes, pseudowords were produced in a delayed paradigm, upon the presentation of a response cue. Event-related potentials (ERPs) were aligned to the participants' vocal onset (1) backwards (i.e. -300 ms preceding the vocal onset), to investigate if the initial syllable composing disyllabic pseudowords are similarly planned as monosyllabic pseudowords before the actual production, and (2) forward (i.e. 200 ms following the vocal onset, corresponding to the minimal duration of the first syllable), to capture potential neural differences between the actual production of monosyllabic pseudowords and that of the first syllable of disyllabic pseudowords. Results of twenty-five participants revealed no differences between monosyllabic and disyllabic pseudowords in terms of accuracy (95% for both conditions) or reaction times (627 ms and 624 ms, respectively). Despite the absence of behavioral differences, ERPs uncovered significant differences in the global dissimilarity index and in the distribution of the same topographies between monosyllabic and disyllabic pseudowords prior to the vocal onset as well as during articulation. Those results suggest that differences in speech motor planning between monosyllabic and disyllabic pseudowords are evident not only before the actual vocalization takes place but also during the production of the first syllable. Further analysis on these results using alternative approaches are planned in the following months.

1-32: Speech timing evidence on the (in)dependence of root and inflection access in production

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Recent research in language production suggests that speakers can override surface word order (contra 1) and plan linearly distant parts of the sentence together (2,3). For example, Momma & Ferreira (2) (M&F) demonstrated an utterance onset delay with related distractor verbs in sentences with unaccusative verbs in picture-naming and took their findings as evidence for early verb planning. If true, this asymmetry in planning may provide a fruitful testing ground for understanding other phenomena, such as number agreement.

The current ePWI work (N=80) aims to use the verb type difference in planning in agreement attraction scenarios to answer whether number inflection is planned independently of the verb as suggested by (5). Our items (1) were adapted from the scenes in (2) and we manipulated: (i) verb type (unaccusative/unergative), (ii) semantic relatedness between the distractor and the verb (related /unrelated), and (iii) attractor number (singular/plural).

(1) The octopus under the spoon(s) is boiling/melting.

Participants were asked to describe scenes with distractor verbs superimposed. If morphological features are planned together with verbs, we expect to see uneven effects of attractor number in both timing and attraction profiles, as speakers should only have access to the head noun, and not the attractor, when planning unaccusatives (2). Unergative verbs should be planned after features of both nouns are available (2), making them more prone to attraction.

Our results present a surprising picture. Attraction errors (M=0.04 with plural attractors) were much rarer compared to previous studies (4,6), possibly due to properties of the attractor objects in the scenes. Our onset timing results suggest a semantic facilitation effect only in singular attractor (spoon) conditions ($P(\theta < 0)=0.91$). We found M&F's signature semantic interference effect in unaccusatives preverbally. However, this effect was only significant in plural attractor (spoons) conditions ($P(\theta > 0)=0.98$).

Taken together, we were not able to replicate the early commitment for unaccusatives reported in (2); and, differently from (2) and previous ePWI findings we found semantic facilitation effects as big as 50ms. We interpret our results' sensitivity to number manipulation as a possible indication to early morphological planning, shifting the overall verb planning forward. Current follow-up studies are probing the specific source of the unexpected drop in attraction error rates.

(1) Levelt 1989 (2) Momma & Ferreira 2019 CogPsych (3) Momma & Yoshida 2023 LCN (4) Kandel & Phillips 2022 JML (5) Caramazza & Miozzo 1997 Cognition (6) Eberhard et al. 2005 PsychReview

1-33: Spelling mistakes in ADHD

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Research has shown that people with attention deficit/hyperactivity disorder (ADHD) may present spelling errors and writing difficulties.
Given that the left superior parietal lobe is responsible for generating and storing the allograph representations and the premotor area of the left frontal lobe generates the motor codes for writing planning, the present study examined whether the writing difficulties of people with ADHD are due to a malfunction in the recovery of movement patterns by the left superior parietal lobe, which leads to a deficient planification of the writing movements by the premotor area of the frontal lobe given the hypofunction of the frontal lobe in ADHD.

A group of 12 people, 6 with ADHD and 6 without it (between 20 and 25 years of age) were administered a pervious cribbage test which consisted in 5 dictation tests, to verify that spelling errors were higher in the ADHD group, once this premise was confirmed, they were administered a test where they had to write a list of words and pseudowords (10 of each category with matching number of letters to control length) and the time it took them to write them was measured using the Ductus program.

The expected results are that people with ADHD take the same amount of time to write words as pseudowords, which would indicate that there is not a correct recovery of movement patterns and that movement must be planned each time, which leads to errors due to hypofunction of the frontal lobe. Even though the study is not finished yet, so far the data confirms that the subjects with ADHD take the same amount of time to write words and pseudowords unlike people without ADHD who take longer to write pseudowords than words.

1-34: The representation of Mandarin Chinese noun-noun compounds in language production

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This study investigated how nominal compounds and their syntactic properties are stored and accessed in speech production. Participants' naming latencies and electrophysiological responses were analyzed to investigate the classifier congruency effect (Wang, Chen, & Schiller, 2019; Huang & Schiller, 2021) in three conditions: (a) morpheme congruent, (b) compound congruent, and (c) unrelated control. In the behavioral data, a significant facilitation effect was observed in the compound congruent condition when compared to the unrelated control condition, while no discernible effect was found in morpheme congruent condition. Electrophysiological data showed a distinct P600 effect emerging in the unrelated control condition compared to the two related conditions, i.e., morpheme and compound congruent. However, within the P600 time window, both compound and morpheme congruent conditions exhibited similar patterns without significant differences. Considering current models of compound production, the data are best explained by a multiple lemma representation account (e.g., Marelli, Aggujaro, Molteni, & Luzzatti, 2012; Sprenger, Levelt, & Kempen, 2006). This suggests that in Mandarin Chinese, the constituent morphemes of compounds are stored independently at the lemma level during the production process.

1-35: Variability and stability in individuals' speech sound production over time

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Increasingly more research focuses on individual differences in segmental production but nearly all evidence for the existence of individual differences has come from studies examining a single speech sample. This represents a tacit assumption, namely, that individuals who show differences in a single sample will show much the same differences in subsequent samples. The stability assumption was tested here by examining the production of 5 Norwegian vowels by 25 native speakers in sessions held over 3 weeks (T1, T2, T3). Participants responded to 50 unique questions per day by choosing one of 3 specific oral responses or saying the Norwegian equivalent of "I don't know the answer (to the question)" or "Nobody can know the answer". F1 and F2 frequencies were measured at the midpoint of /i, æ, ɑ, o, u/ tokens found in the latter two responses, yielding 15,635 tokens for analysis. Individual differences in production of the target vowels were assessed by calculating compactness scores (the quasi-ellipse area calculated from the SDs of the F1 and F2 values) and Pillai score for vowels compared at two times (T1-T2, T1-T3). Low Pillai scores indicated relatively great overlap across sessions, suggesting category stability. Bayesian Repeated Measures ANOVAs implemented in JASP evaluated the null hypothesis that neither the compactness nor Pillai scores would change across sessions (reflected by BF). The fixed effects included Vowel (5 levels), Session (3 levels), and their interaction; the random effect included participants and its interaction with Vowel and Session. Frequentist RM-ANOVAs with the same fixed effects were conducted to cross-check the results (reflected by p values). Analysis of the Vowel factor provided strong evidence of difference in the compactness scores (BF > 30, p < .001) and anecdotal support for the Pillai scores (BF = 1.05, p = .059). The moderate-to-strong evidence for the null hypotheses was that: (1) the compactness (BF = 0.03, p = .992) and Pillai score (BF = 0.17, p = .661) of the vowels did not differ over time; and (2) the null effect of time did not differ between vowels (session * vowel: BF = 0.002, p = .769 for compactness; BF = 0.05, p = .463 for Pillai score). The results supported the view that individuals' productions of native language vowels are stable, at least when production is elicited using a technique that causes participants to focus on the content of what they are saying rather than phonetic form.

1-36: Vowel errors as a window into speech planning mechanisms

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Background: Studies of speech errors in consonants have found that errors show an influence of the intended sound and are thus not phonetically equivalent to their canonical (non-error) counterparts (e.g., Goldrick & Blumstein 2006, Pouplier 2007). It is not yet known whether vowel errors also show trace effects. Models that aim to account for trace effects in consonants differ in the predictions that they make for vowels. Goldrick & Chu (2014) predict shorter vowel duration in errors; Stern et al. (2022) predict trace effects in all dimensions of articulation, including vowel quality. The aim of this study is to elicit errors in vowels in order to adjudicate between these theories based on the nature of any trace effects.
Methods: Using tongue twisters, we elicited errors from English speakers for four vowel pairs: /ɪ/-/ɛ/, /æ/-/ɑ/, /i/-/u/, /ʊ/-/ʌ/. Critical trials consisted of vowel + /b/ segments in ABBA patterns (such as eeb oob oob eeb). Both vowels in each pair were used in A and B positions. Controls consisted of the same vowel + /b/ sequence repeated 4 times (such as eeb eeb eeb eeb). Both trial types were elicited to the beat of a 155 bpm metronome, a method similar to previous studies targeting consonants. 24 trials per participant, 20 tokens per trial, and 12 participants yielded 5760 vowel tokens for analysis. We used machine learning to classify errors, training a support vector machine on control condition vowels and using it to classify critical trial vowels as errorful or canonical. After classification, we tested for trace effects in vowel quality using generalized additive mixed models, and in vowel duration using a linear model.
Results: The procedure successfully elicited errors for all vowels (a total of 122 errors). There was a significant difference in vowel quality between error and non-error tokens for all vowels. Crucially, we saw a trace effect whereby the errorful tokens were always different in the direction of the intention. Vowel durations, in contrast, did not show a main effect of error classification. Only one of eight vowels, errorful (ɛ)s (intended /ɪ/), was significantly shorter than the canonical counterpart. The results indicate that vowel errors, like consonants, show trace effects on the dimensions of primary control in articulation. This is consistent with the Stern et al. (2022) model but not Goldrick & Chu (2014).

1-37: Vowel systems of early Basque-Spanish bilinguals: The role of language use and code-switching habits in phonetic differentiation

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Bilinguals who acquire both languages at a young age face the intriguing challenge of establishing two phonological systems in parallel. Until now, bilingual research used to focus on languages with phonologically distinct phonemes, overlooking the fine-grained phonetic distinctions that bilinguals may exhibit when realizing similar phonemes (e.g., the Basque and Spanish /a, e, i, o, u/). This study investigates how Basque-Spanish bilinguals produce vowels in Basque and Spanish to provide new insights into the organization of phonetic categories beyond the phonological level in bilinguals whose languages have the same five-vowel (/a, e, i, o, u/) system. Furthermore, we explored whether fine-grained phonetic details in early bilinguals' two languages may differ depending on the frequency of language use and code-switching habits. We hypothesized that the distinctiveness of vowels and the differences in vowel spaces between Spanish and Basque, would be predicted by speakers' language use and code-switching habits. Thirty-eight Basque-Spanish early bilinguals read, five times, five Basque and five Spanish words, each containing one target vowel in the first syllable. This design elicited 1,899 tokens (38 participants $\times$ 5 words $\times$ 2 languages $\times$ 5 repetitions - 1 missing token). We manually annotated the steady part of each target vowel and extracted the mid-point of the first three formants and conducted bark normalization to obtain the normalized F1 and F2. Vowel distinctiveness was measured by Pillai scores of the same vowel in the two languages, while the vowel space, for each language, was assessed by the convex hull area. We also surveyed the participants' percentage of speaking Basque and their code-switching frequency between Basque and Spanish. The acoustic analyses showed that, compared to Spanish, Basque /i/ was lower, /i, o, u/ were more fronted, and /a, e/ did not differ. For vowel distinctiveness, frequent Basque users who switch less on word-level showed the largest dissimilarities between the vowels in Basque and Spanish. For vowel space, less frequent word-level code-switching led to smaller vowel space in Basque than in Spanish, regardless of the amount of language use. In conclusion, this study shows that early bilinguals, despite having the same vowel inventories in their two languages, still produce those shared vowels differently (at least vowels /i, o, u/). It also shows that code-switching habits and language use play a significant role in partitioning early bilinguals' two native languages.

1-38: Who is a fluent speaker? Working memory might tell us!

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Spontaneous speech often contains disfluencies like repetitions, silent pauses, or filled pauses. These disfluencies are generally thought to be related to delays or difficulty during speech planning. Previous studies have largely focused on language-based factors (e.g. word frequency) that cause planning difficulties and affect speech fluency. But research has also shown that some speakers are more disfluent than others, suggesting that cognitive skills (e.g., speaker-based factors) may also play a role. One speaker-based factor that is important for speech planning is working memory (WM): Speakers must use WM to remember what has been said and what they want to say. As a result, low WM capacity may delay or affect the accuracy of speech planning, which may in turn affect speech fluency. Consistent with this suggestion, Engelhardt et al. (2019, Quarterly Journal of Experimental Psychology) found that speakers with lower WM capacity produced more silent pauses, while Fehringer and Fry (2007, Folia Linguistica) found that lower WM capacity was associated with more filled pauses. However, previous studies have largely been correlational, and so it remains unclear (1) how WM affects speech fluency; (2) how WM affects different disfluency types; and (3) how language- and speaker-based factors interact in disfluency production. We addressed this issue in our study, focusing on the impact of word frequency and WM load on disfluency production. We employed a network description task, in which participants were asked to name a six-picture network. We manipulated language-based planning difficulty by having participants name pictures with high- or low-frequency names. We manipulated WM load and speaker-based planning difficulty by having participants describe the network while it remained on screen (low WM load) or after it disappeared (high WM load). We additionally measured each participant's WM capacity using the digit span and Corsi block-tapping tests. Data collection is in progress, but we expect that speakers will produce higher disfluency rates when WM load is high and participants have to name from memory. We also expect more disfluencies when the networks contain low-frequency pictures as high-frequency words are better recalled. Results of this study will provide further insights into the influence of working memory on speech planning and speech fluency, extending models of lexical access from fluent to disfluent speech.

MONITORING

What Electroencephalography Tells Us About Controlled Aspects of Language Production

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Although producing language seems relatively easy, a number of cognitive processes are needed to transform ideas into language output. Cognitive control processes are thought to play a crucial role in helping resolve different forms of conflict throughout language production. Which stages require cognitive control and to what extent has been a matter of debate. Our research examines the brain dynamics of cognitive control processes as they interact with core language processes through the use of behavioral data, and scalp and intracranial EEG. Our results show that different parts of the prefrontal cortex are involved in resolving different types of conflict at different time points relative to language output onset, and that these prefrontal areas are functionally connected with core language regions in the left posterior temporal cortex as we are producing language. Importantly, these findings shed light on the cognitive architecture of language production and suggest that close interactions with cognitive control systems are central to our ability to produce language so efficiently.

What we can learn and what we cannot learn from observing neural correlates of speech monitoring

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As Neuroscientists, we seek to understand the neurobiological groundings of observed behavior, ultimately to satisfy our curiosity and to use this knowledge to inform and improve clinical therapy. One reasonable approach that we classically use is to identify correlates of observed behavior in neural data. In this lecture, I will present such ”neural correlates” of speech feedback control, link them with theoretical models and computational solutions and discuss the usefulness and limitations of such an approach. I propose that interpreting speech as a consequence of an agent’s pursuit of subjective hierarchically organized perceptual goals in a dynamically coupled agent-environment system may help us gaining deeper insights into the neurobiology of language.

POSTER SESSION 2

2-01: Animacy Effects on Structure Choice in English Relative Clauses by L1 and L2 Speakers

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Previous elicitation studies of English relative clauses found that adult L1 speakers strongly favor passive (e.g. the baby that is being carried by the woman) over active (e.g. the baby that the woman is carrying) when both agent and head noun are animate, but not when the head noun is inanimate (e.g. the box that the woman is carrying). The predominant explanation has been that speakers use passives to minimize similarity-based competition (e.g., Gennari et al., 2012; Montag et al., 2017). In a study of Spanish, Rodrigo et al. (2018) included a third condition with animate head noun and inanimate agent (e.g. the man that is knocked down by the swing). Results showed the same passive preference, suggesting that the preference cannot be only due to competition between two animate nouns. They supported an alternative: the animacy-based retrieval order mechanism: the animate head noun triggers passive production. The current pilot study is the first to include a fourth condition with inanimate head noun and inanimate agent (e.g. the packages that the truck is carrying), allowing us to distinguish the effect of congruent animacy from that of an animate head noun. In addition, we investigate whether L2 speakers respond differently than L1 speakers.

Methods: A picture elicitation task was administered to ten participants: five advanced L2 English speakers (L1 Chinese) and five L1 English speakers. Each participant viewed 20 images across four animacy conditions (AA, IA, AI, II; AA = animate head noun, animate agent) interspersed with 40 filler images. The same five target verbs were used across all conditions: hit, pull, lift, chase, and carry. In each trial, participants were prompted with a question requiring an oral response (e.g. the box that the woman carries).
Results: Target responses: L1 (92/100; 92%), L2 (86/100; 86%). Percent passive choice by condition (target responses only): L1: AA (96%), IA (63%), AI (95%), II (82%). L2: AA (78%), IA (68%), AI (86%), II (80%). In the L1 group, the trends for AA and AI are consistent with animacy-based retrieval-order mechanism, while a possible effect of similarity-based interference can also be seen in the greater passive preference for II over IA. Trends are similar but less clear for the L2 group.
By presenting this pilot study, we hope to receive feedback to develop a larger dissertation study on the same topic.

2-02: Assessing mild word-finding difficulties in naming: introducing the Picture Naming Cards

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Word-finding difficulties are commonly assessed through classical naming tests where individuals name single pictures without time pressure. However, without time constraints, a picture naming test may be less sensitive for detecting mild word-finding difficulties, surfacing as a ceiling effect in mild cases. Despite the high naming test performance, patient-reported outcome measures sometimes indicate experienced word-finding difficulties in everyday conversations. Thus, tests are needed that tap into subtle features of mild word-finding difficulties in naming.
When faced with time pressure and additional distractions – like one has in everyday conversations – naming becomes substantially more challenging. Therefore we developed a test that introduces additional cognitive demands to the task of picture naming by adding time pressure and interference. Furthermore, our naming test is straightforward to administer and feasible to implement in clinical practice. As a result, we chose a simple visual presentation of pictures on a card, including an easy interpretable system. Our test consists of two cards, each featuring 20 pictures to be named as quickly and accurately as possible. One card is bare picture naming. On the other card written words are overlaid onto pictures with similar semantic concepts, creating an interference effect. Naming accuracy and time to finish the card is compared within (i.e., difference between the two cards) and across participants.
Results from 20 neurologically healthy individuals reveal no distinctions in accuracy or time in the two card conditions. Additionally, we measured eye-movements in relation to speech onset times, as eye-movements might offer more specific insights into potential processes leading to word-finding difficulties. For pictures named incorrectly, we found that the lag between fixation onset and speech onset is longer relative to correctly named items. Ongoing investigations examine whether the Picture Naming Cards effectively reveal mild word-finding difficulties in stroke patients who subjectively report challenges in their everyday conversations.

2-03: Biscriptuality promotes fine motor control

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Biscriptuality is the ability to write in two graphic systems. Biscriptuals are trained to write at an early age in two different scripts. Compared to monoscriptual training, biscriptual training imposes stronger constraints on motor and executive functions. Such constraints could have long-term consequences on the neural circuits driving motor behavior at large. In this context, Latin-Arabic biscriptuality is a relevant case, because Latin and Arabic scripts involve opposite writing orientations and rotation directions. In a recent study (Alhaddad et al., 2023), we found that biscriptuals display higher spontaneous tracing frequencies than monoscriptuals during a loop tracing task, raising the possibility that biscriptuality is advantageous for handwriting.
Two mechanisms could lead to this biscriptual advantage. Due to their extensive training and adaptation to the two scripts, biscriptuals could display either more efficient manual motor control or more efficient domain general executive control than monoscriptuals. The aim of the present study was to replicate the biscriptual advantage, to test it with actual handwriting production, and to disentangle the potential contributions of fine motor skills and executive functions. Among execu- tive functions, we focused on working memory, an important component of several handwriting models.
We measured graphomotor coordination dynamics in a loop tracing task and handwriting proficiency using a standardized text copying task in 33 Latin monoscriptual and 33 Latin- Arabic biscriptual participants. We also assessed the participants' fine motor skills (Purdue Pegboard task and spatial tapping task) and working memory performance (Corsi Block-Tapping Task and N-back task). Results establish that biscriptuals perform better than monoscriptuals in both the loop tracing task and text copying task. Biscriptuals displayed more proficient fine motor skills than monoscriptuals, but the two groups did not significantly differ in their working memory performance. Fine motor skills also predicted several of the indexes of graphomotor coordination and of handwriting in both groups. In sum, biscriptuality promotes graphomotor control and this is mediated by enhanced fine motor skills.

2-04: Bridging verbal coordination and neural dynamics

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Our use of language, which is profoundly social in nature, essentially takes place in interactive contexts and is shaped by precise coordination dynamics that interlocutors must observe. Thus language interaction is high demanding on fast adaptation of speech production. Here, we recorded the intracranial brain activity of 16 patients with drug-resistant epilepsy while they performed a verbal coordination task with a virtual partner (VP). More precisely, patients had to repeat short sentences synchronously with the VP. Based on a real-time coupled-oscillators model - by changing the coupling strength parameters - we could modulate the patients ability to synchronise speech with the VP. This synchronous speech task is efficient to highlight both the dorsal and ventral language pathways. Importantly, combining time-resolved verbal coordination and neural activity shows more spatially differentiated patterns and different types of neural sensitivity along the dorsal pathway. More precisely, high-frequency activity in secondary auditory regions is highly sensitive to verbal coordinative dynamics, while primary regions are not. Finally, the high-frequency activity of the IFG BA44 seems to specifically index the online coordinative adjustments that are continuously required to compensate the deviation from synchronisation. These findings illustrate the possibility and value of using a fully dynamic, adaptive and interactive language task to gather deeper understanding of the subtending neural dynamics involved in speech perception, production as well as their interaction.

2-06: Decoding hierarchical representations of language production during typing

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The hierarchy of cortical areas involved in language perception is becoming increasingly well-defined. Nonetheless, the study of language production faces major technical challenges induced by movement artefacts, and the difficulty to control the precise timing of events. In this study, we use magnetoencephalography (MEG) to decode language production while they typed natural sentences with a qwerty keyboard. We ask how different linguistic features are represented and how these representations evolve over the course of typing.
We tested 17 healthy volunteers in the following task. During each trial, participants first read a target sentence presented word by word in their native language Spanish (reading context), and then typed out the sentence (production context) without any visual feedback of the typing output on the screen. Participants were selected based on their ability to type fast and accurately without looking at the keyboard, with the aim of reducing ocular artefacts on the MEG signal. After data acquisition, we conducted decoding analyses where linear models were trained to predict different linguistic features from MEG recordings to assess the properties of their representations during typing.
Our results are four-fold. Firstly, time-resolved decoding identifies a hierarchy of linguistic representations that become sequentially activated during language production, starting from phrase-level representations, down to word-, morpheme-, syllable- and, finally letter-level production. Secondly, the duration of each of these representations is directly proportional to the position in the linguistic hierarchy. Thirdly, temporal generalization analysis shows that these sequences of representations are encoded in a dynamic neural code, wherein each feature is maintained within a dynamic neural activity subspace that allows the simultaneous representation of successive events. Finally, we reveal that the neural codes for language production partially overlap with those observed during reading, as decoders trained in the reading context successfully generalize to the production context. Collectively, these findings offer the first demonstration of the sequence of hierarchical representations involved in natural language production in the human brain.

2-07: Do cross-language phonological influences vary across bilingual speakers? Insights from a verbal fluency task.

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Increasing evidence indicates that bilinguals activate both of their languages when speaking, but the dynamics of this cross-language activation remain unclear. While previous research has primarily used picture naming tasks, our study employed a verbal fluency task, offering a less constrained approach for investigating these processes. Our objective was to discern which aspects of bilingualism influence the properties of the words generated in this task, thereby improving our understanding of bilingual word processing.

We conducted an online verbal fluency task in English with 99 French (L1) – English (L2) bilinguals. Participants were required to produce as many words as possible in English, in one minute, for each of six semantic (e.g., animals) and six letter (e.g., S) categories. Additionally, participants completed bilingualism assessments including questionnaires and a lexical decision task. Through principal component analysis, we identified three bilingualism components: PC1 (English immersion), PC2 (English proficiency), and PC3 (English age of acquisition), utilised as predictors in subsequent models.

Our analyses addressed the interaction between bilingualism components and properties of the produced words. We predicted that less proficient, more French-dominant participants would generate higher frequency English words with greater translation overlap with their French counterparts ("cognateness") and higher French phonological neighbourhood density (FPND). LME models were run using word-related properties as the outcome measure, whereas GLME models used a binary outcome measure of whether each word produced in the whole dataset had been produced by the speaker.

The first three (LME) models examined the relationship between bilingualism variables and word properties. These models showed that words with higher cognateness, FPND, and frequency were produced first ($p < .001$). No bilingualism component predicted cognateness or neighbourhood, but English proficiency significantly predicted the frequency of words: less proficient speakers produced more frequent words ($p = .003$).

The final (GLME) model investigated the probability of a word being produced, revealing significant facilitatory effects of cognateness, FPND, frequency, and English proficiency. Moreover, significant interactions were observed between FPND and English immersion, and between FPND and proficiency. These interactions were replicated for frequency, but not cognateness.

In summary, as predicted, the words most readily retrieved from the bilingual lexicon were

those with higher cognateness, more phonological neighbours across languages, and higher frequency. Interestingly, age of acquisition of English did not seem to significantly influence these effects, unlike proficiency and immersion. We will discuss the implications of these results for recent theories of bilingual word production and representation.

2-09: Encoding of speech modes with varying articulatory and phonatory properties; an EEG/ERP Investigation

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Control over speech production has been an important aspect of evolution to overcome the varying communicative contexts. In particular, speakers use speech modes that are specific prototypes of speech with variations in phonatory and articulatory features (Zhang & Hansen, 2007). Nevertheless, the brain processes of speech modes are far from being known. Indeed, the Direction Into the Velocities of Articulators (DIVA) model by Guenther (2016) does provide a clear account of standard speech production but not of atypical speech with varying features (Tourville & Guenther, 2011; Weerathunge, 2022). Therefore, in continuity with our previous work (Sanders et al., in prep), here we investigated the behavioral/acoustic and electrophysiological signatures induced by loud speech and by the imitation of an english accent relative to speaking in the standard mode. We hypothesized that these two speech modes will be encoded differently because loud-speaking impacts in particular the phonatory encoding processes while imitating a foreign accent entails changes on the articulatory processes. 24 neurotypical french speakers produced 252 bi-syllabic C1C2V1 C1V1 french pseudowords (e.g., /pRiko/) in a delayed production task with high density EEG recording (Biosemi V.O.F. Amsterdam, Netherlands). After preprocessing steps (i.e., DC removal, high pass/low pass, notch filter, average reference and spatial filter), we averaged epochs of 350 ms (i.e., 179 TF) into event related potentials (ERPs) that were aligned in a backward manner to the vocal onset. Waveform amplitudes, Microstates and inverse solutions have been carried out by comparing the standard condition to the speech modes. Waveform amplitudes analyses and Topographic Analysis of Variance (TANOVA) revealed differences in the last 150 ms preceding the vocal onset for each speech mode relative to standard speech but especially with more clusters in the imitation condition. The spatio-temporal segmentation analysis demonstrated that the imitation condition required the activation of an additional brain network to produce pseudowords in comparison to the two other conditions. Source localization of this additional Microstate showed that motor/prefrontal regions were involved. Loud speech and standard speech only differed in the distribution of the same Microstates. The present results strongly suggest that different speech modes involve specific changes in brain processes in the last 150 ms preceding articulation. These specific encoding processes seem to entail either specific brain networks or a different distribution of the same brain processes as standard speech. This observation supports the hypothesis that each speech mode possesses its own specific encoding processes (Scott et al., 2022).

2-11: Exploring Personality Traits as Moderators of the Foreign Language Effect on Moral Decision-Making

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A significant body of research has evidenced the Foreign Language Effect (FLE), wherein individuals exhibit a propensity for utilitarian choices when confronted with moral dilemmas in a foreign language (FL) compared to their native language (NL). The FLE is linked to non-native languages lacking emotional connections formed during infancy, potentially driving mechanisms that increase utilitarianism, such as heightened analytical reasoning and reduced access to social norms. However, the effect size, though significant, is typically small-to-moderate, with utilitarianism increasing by approximately 10% to 20% in FL contexts.
Our study investigates whether individual differences in basic personality traits moderate the FLE, potentially constraining its effect size. We hypothesized that personality traits predisposed towards deontological choices may mitigate the impact of the foreign language effect.

To test our hypothesis, we conducted an online experiment with 236 female participants. They completed the Mini-IPIP-PW, a concise assessment tool measuring the Big Five personality traits (neuroticism, conscientiousness, extraversion, agreeableness, and openness), in their NL (Spanish). Participants also responded to 21 moral dilemmas akin to the classical footbridge problem, requiring them to decide between prioritizing the common good (utilitarian choice) or adhering to moral principles such as the prohibition against killing (deontological choice). Half responded in Spanish (NL group), while the other half did so in English (FL group). We controlled for potential confounding factors, including general intelligence (with the RAVEN matrices) and reasoning style (analytic vs. intuitive; with the Cognitive Reflection Test).

Consistent with previous literature, we replicated the presence of the FLE, with a 10% increase in utilitarian choices in the FL group compared to the NL group. Additionally, higher levels of neuroticism and lower levels of conscientiousness, regardless of language, were associated with a greater propensity for deontological decisions. This supports our hypothesis that certain personality traits mitigate the FLE. Notably, extraversion exhibited a positive association with utilitarianism, interacting with language such that its influence was significant only in the NL group.
In conclusion, our findings suggest that personality traits, particularly neuroticism and conscientiousness, may moderate the FLE by constraining its effects. Exceptions, such as FL overcoming deontological trends associated with lower levels of extraversion, may help in understanding the complex nature of the FLE mechanisms. Despite the limited and mixed literature on personality traits and moral decision-making, our results provide valuable insights, emphasizing the need for further research integrating personality and FL effects on moral decision-making.

2-12: Filled pauses serve a...um...communicative function: a comparison of self-directed and social speech

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Some authors argue that filled pauses serve a communicative function, such as announcing a delay or holding conversational ground (Clark & Tree, 2002). The current study tested this hypothesis by comparing self-directed vs. social speech. Additionally, we examined the influence of two factors that could influence inter-personal communication and filled pauses use: Autism Spectrum Disorder traits (using the AQ-Short; Hoekstra et al., 2010), and stress (using the SNRS-11; Karvounides et al., 2016).
Participants were instructed to describe series of tangrams to themselves vs. to another participant. Both conditions were counterbalanced across participants. To ensure that they were not focusing on their speech output, participants were asked to perform a recognition memory test afterwards. After each condition, they completed the SNRS-11. At the end of the experiment, they completed the AQ-Short. We predicted more filled pauses in the social condition. We hypothesized that a higher AQ-Short score would be associated with a smaller difference in the use of filled pauses between the conditions. Last, we controlled for the influence of stress by examining whether filled pauses and stress were correlated.

Seventy-three neurotypical native Dutch speakers were tested (age: 20.11 ± 1.73). Filled pauses were coded by two annotators (inter-rater agreement: 92%). Participants produced more filled pauses in the social condition ($t(72)=-2.55$, $p=0.007$). No significant correlation was found between the AQ-Short and the relative difference a participant had in filled pauses in each condition ($r=-0.01$, $p=0.94$). Although stress was higher in the social condition ($t(72)=-7.77$, $p=< 0.001$), no correlation was found with filled pauses, in any condition (self-directed: $r=0.1$, $p=0.42$; social: $r=0.03$, $p=0.81$).

Current findings suggest that filled pauses serve a communicative function, since the presence of an interlocutor increased their rate, regardless of stress level. We therefore assume that they are predominantly by-products of speech difficulties (explaining why they occur in self-directed speech), affected by the presence of a person to whom the difficulty can be communicated.

References:

Clark, H.H., & Tree, J.E.F. (2002). Using uh and um in spontaneous speaking. Cognition, 84(1),73–111.

Hoekstra, R.A. et al. (2010). The Construction and Validation of an Abridged Version of the Autism-Spectrum Quotient (AQ-Short). J. Autism Dev. Disord., 41(5),589–596.

Karvounides, D. et al. (2016). Three studies supporting the initial validation of the stress numerical rating scale-11 (Stress NRS-11): A single item measure of momentary stress for adolescents and adults. Pediatric Dimensions, 1(4).

2-13: Gender congruency effects in Spanish: Behavioral evidence from noun phrase production

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Grammatical gender as a lexico-syntactic feature has been well explored, and the gender congruency effect has been observed in many languages (e.g., Dutch, German, Croatian, etc.). Yet, so far, the effect has not been found in Romance languages such as Italian, French, and Spanish. It has been argued that the absence of the effect in Romance languages is due to the fact that the gender-marking definite article is not exclusively dependent on the grammatical gender of the head noun, but also on its onset phonology (e.g., lo zucchero 'the sugar' in Italian, not il zucchero). For Spanish, this argument has also been made because feminine words starting with a stressed /a/ take the masculine article (e.g., el água 'the water', not la água). However, the number of words belonging to that set is rather small in Spanish, and it may be questionable whether this feature can be taken as an argument for the absence of a gender congruency effect in Spanish. In this study, we explored whether or not grammatical gender, as a lexico-syntactic feature in Spanish, is used to competitively select determiners in the production of noun phrases by native Spanish speakers in a well-controlled experiment. We employed the picture–word interference paradigm to examine the naming latencies of 30 participants for twenty black-and-white pictures. Each picture was assigned four distractors, which were manipulated in four conditions according to their gender congruency, i.e., gender-congruent (G+) and gender-incongruent (G–), and semantic relatedness, i.e., semantically related (S+) and semantically unrelated (S–). As a result, four conditions were generated for each target picture: G+S+, G+S–, G–S+, and G–S–, and a total of 80 combinations of picture and distractor pairs were generated. For each combination, participants were expected to name the target picture as fast and accurately as possible with a Spanish noun phrase (e.g.,'el gato' (theMas catMas)) while ignoring the distractor word. Naming latencies were calculated and extracted from all recorded NPs of 30 participants, and a generalized linear mixed model (GLMM) was employed for statistical analysis. Results revealed significantly longer naming latencies in gender-incongruent and semantically related conditions compared to gender-congruent and semantically unrelated conditions. These results provide crucial evidence supporting the notion that grammatical gender in determiner-NPs is competitively selected and that this competition is reflected in speakers' naming latencies. Our findings provide an important behavioral piece of evidence for the gender congruency effect in Romance languages.

2-14: How far does spoken word preplanning proceed during comprehension of a sentence?

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Previous research into word production has indicated that context-driven preplanning can occur. Depending on communicative goals and task demands, the preplanned units may range from phonemes to whole words. The present study investigated how far word preplanning proceeds during comprehension of a sentence with an intention to speak, in particular, whether (a) lexical selection and phonological encoding are preplanned and (b) the phonological form is preplanned beyond initial phonemes.
In two experiments, we used context-driven object naming, where the picture to be named is either preceded by a constraining (The cat is chasing a ... (mouse)) or an unconstraining (The spot looks like a ... (mouse)) auditory sentence. Picture naming reaction times (RTs) were collected. In the constraining compared to the unconstraining condition, representations associated with the sentential context can be preplanned before picture presentation. To determine the extent of this preplanning, we investigated lexical and phonological processes via the effects of lexical frequency (i.e., high frequency words are named faster than low frequency words), word length (i.e., shorter words are named faster than longer words) and phonological priming (i.e., phonological overlap speeds up naming) within each sentential context. Presence of the effects in RTs suggests that the processes occur during the corresponding planning stage after picture presentation. The absence of the effects indicates that the processes were completed before picture presentation.

In Experiment 1, we reanalysed existing RT data (N=58), using lexical frequency and word length of the targets as proxies for lexical-semantic and phonological processes, respectively. We found a frequency effect in picture-naming RTs following unconstraining sentences only. This suggests that lexical-semantic preplanning occurred only in the constraining context. The phonological effect was statistically non-significant for both context conditions.

To further investigate the phonological effect, we are currently conducting two new experiments (each N=30). Using the same task and stimuli, we present the pictures (e.g., ‘mouse’) simultaneously with phonologically related or unrelated auditory fragments (Experiment 2a: initial fragments, related: ‘mou’, unrelated: ‘tray’; Experiment 2b: final fragments, related: ‘ous’, unrelated: ‘ain’). If phonological preplanning occurs in constraining contexts, the two types of fragments will demonstrate whether only the first phonemes or the whole word is preplanned (no facilitation for initial or final fragments, respectively).
Taken together, this study will further characterise preplanning of spoken words at the crossroads of language comprehension and production.

2-15: Independent effects of age, education, verbal working memory, motor speed of processing, locality and morphosyntactic category on verb-related morphosyntactic production: Evidence from healthy aging

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This study investigates the role of locality (a material-related variable), demographic factors (age, (years of formal) education, and sex), cognitive capacities (verbal working memory (WM), verbal short-term memory (STM), speed of processing (SOP), and inhibition), and morphosyntactic category (time reference and grammatical aspect) in verb-related morphosyntactic production (VRMP). A battery of seven tasks was administered to 200 neurotypical Greek-speaking participants, aged between 19 and 80 years. This included a sentence completion task tapping production of time reference and grammatical aspect in local and nonlocal configurations, and cognitive tasks measuring verbal WM capacity, verbal STM capacity, motor SOP, perceptual SOP, and inhibition. We fitted generalized linear mixed-effects models and performed path analyses. Significant main effects of locality, age, education, verbal WM capacity, motor SOP and morphosyntactic category emerged. Specifically, more morphosyntactic errors occurred in nonlocal than in local configurations; the older the participants and the lower their education level, the worse their performance in the task tapping VRMP; the greater the participants' verbal WM capacity and the higher their motor SOP, the better their performance in the VRMP task; participants fared significantly better on time reference than on grammatical aspect. Production of time reference and grammatical aspect did not interact with any of the significant factors (i.e., age, education, verbal WM capacity, motor SOP, and locality). Moreover, locality did not interact with any memory system. Path analyses revealed that the relationships between age and VRMP, and between education and VRMP were partly mediated by verbal WM; and the relationship between verbal WM and VRMP was partly mediated by perceptual SOP. Results suggest that subject-, task/material- and morphosyntactic category-specific factors determine accuracy performance on VRMP; and the effects of age, education, and verbal WM on VRMP are partly indirect. The fact that there was a significant main effect of verbal WM but not of verbal STM on accuracy performance in the VRMP task suggests that it is predominantly the processing component (and not the storage component) of verbal WM that supports VRMP. Lastly, we interpret the results as suggesting that VRMP is also supported by a procedural memory system whose efficiency might be reflected in years of formal education.

2-16: Individual Differences in Verbal Working Memory Impact Prediction Performance during Sentence Comprehension

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Language comprehension is a rapid and efficient process, in part facilitated by our ability to quickly predict the upcoming content. The current study took an individual differences approach investigating the cognitive factors mediating predictive performance, focusing on the role of working memory (WM). Previous work has shown that semantic WM – the ability to temporarily maintain word meaning information - plays a greater role than phonological WM – the ability to temporarily maintain word sound information - in supporting sentence comprehension. Therefore, we hypothesized that semantic WM, but not phonological WM, would relate to prediction performance.

Sixty older adults were recruited as participants. Prediction performance was assessed through a sentence completion task, where participants predicted the final word for auditorily presented sentences. The task included four sentence types with increasing WM demands: (a) short, highly predictable sentences, "I could not remember his (name)." (b) preceding clause changing prediction, "I wanted to give him a phone call, but I could not remember his (number)." (c) irrelevant initial clause, "When I was at work yesterday, I wanted to give him a phone call, but I could not remember his (number)," (d) irrelevant intervening clause, "I wanted to give him a phone call, when I was at work yesterday, but I could not remember his (number)." Semantic WM was assessed using a composite of category probe, conceptual span, and synonym probe; phonological WM was assessed using a composite of digit matching span, digit span, rhyme probe, and nonword repetition. A speeded picture naming task was also used to control for participants' ability to quickly retrieve stored word information from memory.

To examine the general working memory hypothesis, we used Helmert coding to compare prediction performance across the four sentence types. Significant main effects were found showing that prediction performance diminished with longer sentences and when there was increased separation between the key content clause and the prediction response, supporting a role for WM in prediction. To address the influence of different types of WM, we conducted a set of multiple regression analysis where the mean performance on the more difficult condition(s) was regressed on the easier condition as baseline, with composite semantic and phonological WM scores and mean naming accuracy as predictors. Results showed significant independent contribution of semantic WM, but not phonological WM.

2-17: Intensive preoperative rehabilitation of word production in temporal drug resistant epilepsy: An experimental case study

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Of the 30,000 new cases of epilepsy in France every year, 30% are drug resistant. Surgery, which consists of resecting the epileptogenic zone, is the only chance of a cure. In the case of temporal lobe epilepsy (TLE) in the dominant hemisphere for language, this surgery presents a high risk of increasing cognitive difficulties and may even be contraindicated for this reason alone. The difficulties include problems of lexical access (anomia) and verbal memory, affecting more than 40% of patients (Bartha-Doering & Trinka, 2014; Busch et al., 2016). According to Mazur-Mosiewicz et al. (2015) and Baxendale (2020), pre-operative cognitive rehabilitation (prehabilitation) could influence cerebral plasticity mechanisms and thus provide a protective reserve, but there is currently very limited evidence for this hypothesis. In this context, we developed a speech therapy specific to the needs of patients with epilepsy and language and memory difficulties. Our intervention combines an e-health device enabling the patient's self-rehabilitation at home with a face-to-face psychoeducation and support by the speech therapist. We proposed this prehabilitation to six left TLE patients in the form of a Single Case Experimental Design (SCED). The results were analyzed both visually and statistically. Significant progress was reported during rehabilitation. Post-operative language performance remained stable in three patients, while one patient showed a worsening of performance post-operatively. Generalization effects to untrained items were variable. The data of the two other patients could not be interpreted. The poster will present in detail the protocol and its encouraging results.
Bartha-Doering & Trinka, 2014: https://doi.org/10.1111/epi.12743

Busch et al., 2016: https://doi.org/10.1212/WNL.0000000000003378

Mazur-Mosiewicz et al., 2015: https://doi.org/10.1111/epi.12963

Baxendale (2020): https://doi.org/10.1016/j.yebeh.2020.107027

2-18: Investigating the origin of the phonological errors observed under dual-task conditions in neurotypical individuals

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Introduction

Speaking is affected under dual-task conditions and an impact on phonological errors has been reported in people with aphasia (PWA) on word production with verbal (Demierre et al., 2023) and non-verbal (sounds of daily life, Demierre et al., in prep) concurrent auditory stimuli. In neurotypicals, only concurrent verbal stimuli impacted word production in terms of increased errors (Demierre et al., in prep). This interference effect has been explained by two major hypotheses. With concurrent verbal stimuli, the interference effect has been attributed to the cross-talk effect, due to the phonological overlap between the tasks (Navon & Miller, 1987). Another explanation is the limitation of the attentional resources (Navon & Miller, 2002). In recent studies (Demierre et al., in prep), it has been suggested that probably both sources of interference are involved, a conclusion that needs to be assessed by investigating the impact of different types of concurrent stimuli/tasks. This study aims to assess the contribution of each source of interference by investigating the impact of different types of stimuli as concurrent auditory stimuli in a dual-task paradigm on the same group of neurotypicals.

Method

Thirty-four neurotypicals took part in the study (aged 18–30, mean: 21,03; SD = 2.66, 6 men). Participants underwent a picture naming task and an auditory detection task separately and under dual-task conditions in three different blocks. Each block was associated with one type of concurrent stimuli (syllables, sounds of daily life, tones). Under dual-task condition, the auditory stimuli appeared 300 ms after the picture onset, corresponding to the time-window associated with phonological encoding (Indefrey, 2011). Participants were instructed to name the pictures, while pressing a key when hearing the auditory target.

Results

Naming latencies increased under dual-task condition with each type of stimuli as compared to single task condition, with a larger slowing with syllables. Phonological errors increased only with syllables as compared to naming only condition.

Discussion

The increase of phonological errors with syllables replicates what was observed in previous studies with PWA (Demierre et al., 2023) and neurotypicals (Demierre et al., in prep). This increase of phonological errors could be attributed to the cross-talk effect due to the phonological overlap between tasks. As proposed recently, results suggest that interference is the result of a combination of sources, including cross-talk effects and the limitation of the attentional resources, as naming latencies increased under dual-task condition, independent of the type of stimuli.

2-19: Is the octopus regenerating?: Comparing timing effects in sentence recall and picture description tasks

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Prior work suggests that sentence recall can elicit and measure some phenomena found in typical (non-recall) production, including phenomena observed via picture description tasks (4,1). Potter and Lombardi's regeneration hypothesis (4) proposes that sentence recall involves regenerating the sentence from its meaning in a manner akin to typical production; if true, the flexibility of sentence complexity offered by recall tasks greatly expands the options for studying speech production. Recently, Momma & Yoshida (3) (M&Y), using the sentence-word interference (SWI) sentence recall task, reported a slowdown with related distractor verbs in sentences with filler-gap dependencies, similar to Momma & Ferreira's (2) (M&F) picture-description demonstration of an utterance onset delay with related distractor verbs in sentences with unaccusative verbs. However, the possibility remains that sentence recall and picture description differ in the granularity of the measurements they detect or even the production mechanisms they engage. A comparison of the two tasks' verb production timing measurements using the same materials (i.e. the same elicited sentences) could help clarify their differences and shed light on the production mechanisms involved in each task.

In the current work (N=78), we compare the SWI and ePWI methodologies by combining M&Y's SWI task with the English sentences from M&F's ePWI study. We manipulated verb type (unaccusative vs. unergative) and semantic relatedness between the distractor and main verb. Participants read a sentence word-by-word, then 2-4 random verbs, before a distractor in red prompted them to recall the sentence. Our results showed moderate evidence for a main effect of unergativity in a preverbal position ($P(\theta > 0)=0.90$). Unlike M&F, there was no interaction with semantic relatedness ($P(\theta > 0)=0.42$), meaning participants slowed just before they uttered unergative verbs, independent of distractor relatedness. We found no evidence for the main effects of verb type ($P(\theta < 0)=0.83$), relatedness ($P(\theta < 0)=0.62$), or interaction ($P(\theta < 0)=0.64$) for the onset latency measure; related distractors in unaccusative sentences did not cause a sentence onset slowdown, failing to demonstrate a signature finding for verb planning effects (e.g., (2)).

By directly comparing ePWI with SWI, we demonstrated that the methodologies reveal diverging effects. Our findings raise questions about how generally sentence recall can be used to interrogate timing effects in production.

References: (1) Chang et al. 2003 Cognition (2) Momma & Ferreira 2019 Cog Psych (3) Momma & Yoshida 2023 LCN (4) Potter & Lombardi 1998 JML

2-20: Low-activity distributed brain networks encode syntax during sentence production

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Traditionally, syntax has been associated with inferior frontal gyrus (IFG) and posterior temporal lobe (PTL), although evidence is growing for a distributed representation throughout left peri-Sylvian cortex. The experimental literature, however, has relied heavily on (a) comprehension paradigms, during which syntactic processing is highly dynamic; (b) neuroimaging/electrophysiological techniques with either high spatial or temporal resolution, but not both; and (c) coarse-grained comparisons of stimuli where syntax is present (e.g., sentences) to stimuli where it is purportedly absent (lists). Here we present a complement to this body of work, leveraging electrocorticography (ECoG) and a controlled production experiment with a fine-grained syntactic manipulation. Seven patients performed three tasks: picture naming, list production, and sentence production. During sentence production trials, patients were primed to overtly describe cartoon scenes using active syntax ("The chicken poked Dracula") or passive syntax ("Dracula was poked by the chicken"). We take two approaches to identifying syntax: First, we perform the traditional comparison of sentence and list activity, and identify 147 electrodes distributed across left peri-Sylvian cortex with higher sentence activity (only 19 of which can be accounted for by semantics). Second, we compare trials with active and passive syntax, and identify 233 electrodes. However, only 39 electrodes are commonly identified by these two analyses, meaning that the sentence-list comparison misses 194 (=233-39) electrodes containing syntactic information. To better understand this, we employ a variant of Representational Similarity Analysis to independently identify syntactic, event-semantic, and lexical information in the signal. We use this approach to approximate the amount of information about each of these three linguistic features over time in each electrode, and show that syntactic information (as indexed by differences between actives and passives) is uncorrelated with neural activity. This important finding spells trouble for experimental approaches that aim to look for syntactic processing by comparing neural activity during sentences and lists, and indicates the need for the field to consider other ways this information might be coded at the neural level. Finally, we aim to characterize the spatiotemporal distribution of syntactic information in the brain. Using unsupervised clustering, we identify three syntactic subnetworks whose amount of syntactic information with distinct temporal peaks: early (_~200ms post-stimulus), middle (_~900ms post-stimulus), and at speech onset (_~1100ms post-stimulus). All three networks are highly distributed, but two surprising generalizations stand out: a high concentration of syntactic information in middle frontal gyrus in the early cluster, and only later engagement of PTL/IFG.

2-21: Neural correlates of lexical alignment in native and non-native interactions

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Speakers tend to align to the lexical choices of their interlocutors, a term referred as lexical alignment. While lexical alignment is argued to contribute to mutual understanding and ultimately to successful communication in native-native interactions, it is relatively unknown how interactions involving a non-native speaker might influence lexical alignment. Two possible explanations have been proposed: the priming account considers that the occurrence of lexical alignment is due to the priming of speaker's lexical representations. Within this framework, lexical alignment should not be modulated depending on the linguistic characteristics of the interlocutor. The audience design account, on the other hand, assumes that interlocutors have into consideration the linguistic characteristics of the interlocutor. Within this framework, differences between native and non-native interactions would be expected. In two EEG experiments, we evaluated the behavioral and neural signatures of lexical alignment in native-native and native-nonnative verbal interactions. In a joint picture naming task, participants were asked to take turns with a native or a non-native "confederate". We manipulated whether the confederate named the picture (e.g., COLOGNE) with a favored name (name agreement of 60-70%) or with a disfavored name (name agreement of 30-40%). Behavioral and EEG alignment responses were obtained when speakers interacted with native and non-native partners. Participants aligned to their partners by using disfavored names rarely used otherwise. Lexical alignment was modulated by the interlocutor's accent, with participants aligning more with individuals of the same accent than those speaking with a foreign accent. ERP responses locked to the production of the interlocutor (comprehension trials) revealed more negative waveforms when hearing disfavored than favored words starting around 300 ms after the auditory stimuli onset. In addition, ERP responses locked to the pictures assigned to the participant (production trials) revealed differences between pictures whose corresponding names were previously named with a disfavored than those pictures named with a favored name (P200). This effect was larger for participants interacting with native partners. Our results suggest lexical alignment as an important feature of language in interaction, modulated by non-goal directed (priming of lexical representations) and goal-directed mechanisms (i.e., beliefs about the communicative competence of interlocutors).

2-22: On idle idols and ugly icons: Do homophones create interference in typing?

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Most of us have experienced replacing words with a (heterographic) homophone (e.g., ”there”, ”they’re”, and ”their”) when writing or typing. It is still debated whether this homophone interference effect is lexical or sub-lexical in nature. Based on computational simulations using the interactive two-step model of language production (Dell et al., 1997), we show that assuming a lexical locus of the effect is necessary to discriminate between a target word and its homophone competitor in spelling-to-dictation. Moreover, we modelled the influence of syntax (i.e., whether the competitor belongs to the same vs. a different syntactic category) and sentence conflict (i.e., whether the competitor also appears in the sentence or not) on the activation of the target vs. competitor orthography. These simulations predicted more homophone interference in high vs. low conflict sentences, and an effect of syntax (i.e., more interference for same vs. different categories) that could range from weak to very strong depending on how much syntax contributed to the lexical boost in Step 2 of the model. If these predictions are borne out in behavioral data, this would support a lexical locus of the homophone interference effect, since all predicted effects are driven by lexical activation. To test the predictions, English native speakers (N= 124 for each experiment) performed a sentence dictation task (Experiment 1) and a question-answering task (Experiment 2), in which they typed responses to spoken questions based on pictures, while repeating all elements from the question. We compared the typewriting of homophone pairs in high vs. low conflict sentences (i.e., both homophones vs. only one homophone in the sentence, respectively). The pairs either belonged to the same (e.g., ”son” (noun) - ”sun” (noun)) or different syntactic categories (e.g., ”loan” (noun) - ”lone” (adjective)). We measured onset reaction times, pre-target inter-key-intervals (IKIs), target IKIs, and accuracy. In Experiment 1, we found a homophone interference effect in accuracy and pre-target IKIs, independent of syntactic category. Participants also had higher pre-target IKIs in high vs. low conflict contexts. In Experiment 2, this effect was replicated, but in addition, participants had higher ORTs and target IKIs in high vs. low conflict contexts. Together with the simulations these results show a robust, lexically-situated homophone interference effect that is sensitive to sentence conflict, but when deeper processing of the sentence is involved, the conflict effect is more pronounced. Furthermore, the contribution of syntax in this effect seems to be limited at most.

2-23: Partner-specific facilitation in word production

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Seminal work evidenced that dialogue partners tend to speak in increasingly similar ways, that is they entrain (or, align) on various linguistic aspects of their utterances (Brennan & Clark, 1996; Garrod & Anderson, 1987; Metzing & Brennan, 2003). However, it remains debated whether this entrainment is 'partner-specific' (Brennan et al., 2010) or whether it only reflects 'simple priming and recency' effects (Pickering & Garrod, 2004). Here, we ask whether production of entrained words is facilitated above and beyond simple priming and recency effects. We test this hypothesis by means of a modified matcher task carried out by the experimental subject in interaction with two different partners (both confederates).
In the TRAINING PHASE, the subject is expected to entrain with the respective task partner on a specific word to refer to ambiguous tangram figures. The partners will name the tangrams with predefined words (unbeknownst to the subject). The subject will have to respond by selecting the corresponding tangram in an array of distractor tangrams. Half of the tangrams will be trained with one partner, and the other half will be trained with the other partner. Notice how all tangrams and corresponding words will be equally (en)trained and therefore elicit comparable priming and recency effects.

In the TEST PHASE, the roles will be inverted. The subject's task will be to name the tangrams so that the partner can select them among an array of distractor tangrams. In this case however, no specific word will be provided to the subject. Instead, we will record the subject's word choice and how quickly the subject can produce it. The task will be conducted with each partner in separate blocks. Some tangrams will be tested with the same partner they were (en)trained with and others with the other partner, resulting in a manipulation of partner type (same vs. different).

We hypothesize that language production is facilitated when an entrained word is produced for the partner it was entrained with, compared to when the same word is produced for the partner with whom the word was not entrained. If entrainment is partner-specific and goes above and beyond mere priming and recency effects, we should detect higher word maintenance and shorter naming latencies for the same vs. different partner conditions. With this study we aim to gain insights into the question to what extent lexical access is shaped by discourse history with a given task partner.

2-24: Physical exercise to improve language skills: two prospective studies.

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The impact of physical activity has been largely investigated on executive functions but less on language skills. On neurotypical participants, a better words learning has been associated with a walking activity (Schmidt-Kassow et al., 2014), cycling, running and swimming (Winter et al., 2007; Schmidt-Kassow et al., 2010, 2013; Pruitt & Morini, 2021; Mellor & Morini, 2023). In their systematic review, Mayer et al. (2021) highlighted the overall beneficial effect of physical exercise for language skills, but they also reported that, due to lack of homogenous methodology among researches, it is currently unknown (1) to what extend the effects on language are mediated by other cognitive functions and (2) which language processes benefit from physical activity and it has an impact on utterance production. Here we aim at addressing these two open issues. In Study 1 (ongoing) 60 neurotypical young adults come to a lab that is located on a hill and undergo a set of language, executive tasks and a speed processing test. They will be split in two groups depending on how they come to the laboratory (i.e. with physical activity or none). They will complete the tasks immediately after. Given that the effects of physical activity have been shown to last about 15 minutes (Pontifex et al., 2019). A better performance in executive tasks and in language tasks involving lexica-semantic processes is expected for group of participants climbing the hill relative to those coming by car/bus but only in the tasks performed immediately after arrival. The second study will focus on words learning over a two week period with a within subject cross over design. Thirty neurotypical young adults will learn two matched lists of new/rare concrete words prior to cycling or watching a silent movie. Picture naming, a semantic picture word interference (PWI) and executive functions will be assessed. We expect that rare words learned with cycling will be learned and produced better and displayed higher sensitivity to PWI than those learned prior to silent movie. The two studies are currently ongoing: the complete results of Study 1 will be available and presented and partial results of Study 2.

2-26: Say it again, you will be faster: Phrase naming latency decreases with phrase repetition

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Most psycholinguistic models assume that the language production system keeps track of its encounters with individual words. As a result, more frequent words can be accessed faster for production than less frequent words (Oldfield & Wingfield, 1965). By contrast, these models do not keep track of phrase frequency. Yet, several correlational studies have shown that more frequent phrases can be planned faster than less frequent phrases, even with individual word frequency taken into account (Jansen & Barber, 2012; Jeong et al., 2021). These findings show that information about the frequency of more than just isolated words, cumulated across the course of a life time, is used by the language production system. In the present study, we seek evidence that speakers continuously update their language production system not solely on an individual word level, but also on the phrase level. To do so, we track how repeated exposure to phrases impacts the time needed to plan these phrases in subsequent production tasks.
Participants came on two subsequent days. On the first day, they went through a test session and six exposure sessions. The second day started with six exposure sessions and ended with the second test session. The task in test and exposure sessions was identical: participants named pictures using a pre-nominal adjective and a noun. Test sessions on day 1 and 2 were identical. Exposure sessions were designed to vary phrase repetition, but keep individual word (adjectives and nouns) repetition fairly constant. Therefore, some words were kept in the same phrases as in the test sessions, while others were produced in novel combinations.

The analysis of the time interval between onset of picture presentation and onset of vocal response in the test sessions shows that participants were faster in the latter test session for phrases that were repeated across sessions. An analysis of all sessions data reveals benefits of phrase repetition even with the earliest repetitions in day 1 exposure sessions, lasting across all experimental sessions. These results were replicated in a second experiment where participants were additionally tested on day 3, after a night of sleep but no additional exposure.
These results provide evidence that the language production system can adapt its performance based on phrase frequency and not just word frequency. We argue that we need to expand psycholinguistic models of language production to allow for facilitation when producing words that often occur together.

2-27: Sensorimotor similarity in the continuous naming task

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In the continuous naming paradigm, pictures from a category are named intermixed with unrelated and filler items, with increasing naming times for each named item from the same category (cumulative semantic interference, CSI). This cumulative increase is caused by the lexical selection becoming more and more difficult, which is explained by either an increasing lexical competition due to a larger co-activated cohort or an inhibition of items which have been co- activated without having been selected.
While previous research has mostly focused on interference based on semantic categories, the continuous naming paradigm is very sensitive to even small traces of lexical competition, showing cumulative interference effects for concepts related through associations (Rose & Abdel Rahman, 2016), thematic links (Lin et al., 2021) and even loose event-relations (Lin et al., 2022), with the strength of the interference increasing with the degree of semantic relatedness (Lin et al., 2022).

However, meaning relations between words are not limited to these abstract semantic links. Theories of grounded cognition argue that our experiences form multimodal representations and are partly re- activated (simulated) when recalling a concept (Barsalou, 2008). In this way, concepts can also be related through being grounded in similar experiences. In the present study we test whether sensorimotor similarity between concepts leads to semantic-lexical co-activation and induces interference effects comparable to measures of semantic relatedness based on category membership and distributional measures of similarity (based on word co-occurrences) in the continuous naming task.
We are currently re-analysing the data from 15 continuous naming experiments (81569 trials from 428 participants). By adding measures of sensorimotor strength (Lynott et al., 2020), sensorimotor similarity (Wingfield & Connell, 2023) as well as linguistic proximity (Cosine similarity measures based on ”de_wiki” from Günther et al., 2015), we can expand meaning dimensions to include sensorimotor relations additionally to classis semantic relations and test their contribution to cumulative semantic interference.

2-28: Sharp as a tack: exploring the role of iconicity in language production

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Despite standard assumptions about the arbitrariness of sound-meaning correspondences, empirical works show the existence of non-arbitrary mappings in natural language: for instance, crosslinguistically, speakers are biased to label round shapes via phonemes like /a, b, m/, and spiky shapes via others like /i, k, t/, a phenomenon known as the bouba-kiki effect (McCormick et al., 2015). The effect has been largely observed experimentally with pseudowords, as well as statistically within natural language lexica. However, less attention has been dedicated to its experimental replication with existing words. Consequently, little is known of whether iconicity should make a difference in the cognitive representations of words, and therefore matter for the sake of lexical access – i.e., the cognitive flow going from conceptual activation to word form retrieval (Levelt et al., 1999). To investigate this issue, we tested whether word retrieval in language production would be facilitated when there is iconic congruence between conceptual and phonological representations. We developed a picture naming task in French, consisting of 80 images (Bonin et al., 2003; Alario & Ferrand, 2004). Half of the stimuli were selected for being examples of iconic congruency (e.g., ballon, 'baloon'; cactus, 'cactus'): such images have round or spiky shapes and, according to the model in Sidhu et al. (2021), their corresponding words hold congruent round or sharp associations. The other half of the stimuli were selected for being neutral in sound symbolic terms, i.e., non-iconic (e.g., aile, 'wing'; dauphin, 'dolphin'). Given the observed correlations between iconicity and age of acquisition (Monaghan et al., 2014), stimuli were also chosen according to an AoA split: each condition consisted in half of the words being acquired early (i.e., before 4.5 years), and the other half being acquired late. Reaction times and accuracy measures were collected on a preliminary sample of 8 adults, ranging 18-27 y.o. Reaction times showed faster responses for iconic compared to non-iconic items, with a larger difference among late-acquired words (M1 = 1164ms; M2 = 1239ms). Consistently, accuracy showed higher percentages of correct responses for iconic compared to non-iconic items, with a larger difference among late-acquired words (M1 = 76%; M2 = 58%). Preliminary statistical analyses suggest significant differences between conditions, but data collection is still ongoing. Such results support then the idea that iconicity impacts lexical retrieval by facilitating the production of words featuring non-arbitrary links between phonological and conceptual features. Implications for current models of lexical access and representation will be discussed.

2-29: Small words in the picture: The production of discourse particles by Dutch speakers with primary progressive aphasia

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For most people, language production runs smoothly. However, this does not hold for individuals with primary progressive aphasia (PPA). PPA is a neurodegenerative disorder in which language deficits are the most prominent clinical symptoms (Mesulam, 2001). Semi-spontaneous language analysis is a valuable tool in characterising linguistic deficits and diagnosing PPA (Boschi et al., 2017). Previous research on semi-spontaneous language production in PPA has mainly focused on linguistic variables at the word and sentence level. Until now, few studies on language production in PPA have been devoted to studying the discourse(-pragmatic) level. However, discourse production in general and discourse particles in particular play a crucial role in everyday life (e.g., for maintaining social relationships). Discourse particles (e.g., ja 'yeah') are a set of words that have a variety of functions such as structuring the discourse and marking the relationship between the hearer and the speaker (Van Bergen & Hogeweg, 2021). Previous research suggests that discourse particles can be used to promote social conversations in persons with aphasia (Simmons & Damico, 1996). Yet it is largely unclear how individuals with PPA use discourse particles (Sajjadi et al., 2012). Therefore, the aim of this study is to investigate the use of discourse particles by Dutch speaking individuals with PPA. The present study comprised 58 individuals with PPA and 40 neurologically healthy speakers (NHS). The diagnosis of PPA was established based on extensive multidisciplinary assessment. Data consists of the picture description task of the Dutch version of the Comprehensive Aphasia Test (Visch-Brink et al., 2014). The language samples were transcribed by the first author and analysed for the use of discourse particles. Proportions of the discourse particles of interest were contrasted between persons with PPA and controls using a Wilcoxon non-parametric test. We found that individuals with PPA produced a larger proportion of discourse particles compared to NHS, $p = .04$. Furthermore, the research also examined whether the distributions of the produced discourse particles differed between the two groups, using a linear mixed-effects model. We found that individuals with PPA produced a larger proportion of ja compared to NHS, $p < .001$. One can speculate that ja is used by individuals with PPA to compensate for word-finding difficulties. However, other explanations are also possible. A better understanding of language production at the discourse level can be a valuable addition in diagnosing PPA or in therapeutic approaches.

2-30: Syntax in sentence production and comprehension: shared or modality-specific?

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There is an ongoing debate whether the syntactic processes underlying sentence production and comprehension are shared between the two modalities or whether they are modality specific (see e.g., Indefrey, 2018, for a review). In a treatment study for individuals with aphasia (IWA), Schröder et al. (2018) found that treatment generalisation across syntactic structures in sentence production relied on the integrity of the comprehension system and thus proposed a unidirectional dependency with production being dependent on comprehension. However, the sentence elicitation task they used to assess sentence production involved both production and comprehension as participants needed to comprehend an elicitation sentence before producing the target sentence (Mészáros, 1997). The current experiment revisits the discussion about modality specificity of syntactic processes by assessing production and comprehension of both canonical and non-canonical syntactic structures, while avoiding methodological weaknesses of previous studies. Canonicity effects (i.e., faster and more accurate responses in canonical vs non-canonical sentences) in production and comprehension are taken as a proxy of syntactic abilities and are compared between the two modalities. If differences in canonicity effects are observed between modalities, this suggests that syntactic processes differ between modalities. Data from 73 neurotypical German native control participants and 17 IWA were analysed. Participants completed a picture description and a sentence-picture-matching task to assess sentence production and comprehension performance, respectively. In both tasks, half the sentences were canonical (active declarative sentences), and the rest were non-canonical (passive declarative sentences).

Results of the reaction times analyses for controls and IWA showed non-significant interactions between canonicity and modality. In contrast, in the response accuracy analysis, IWA's canonicity effect was stronger in sentence production than in sentence comprehension. This latter result suggest that syntactic processes may be modality-specific, however, given the contrasting results of the reaction time analyses, this needs further exploration. Specifically, the effect in the accuracy analysis could be driven by many IWA's difficulty to accurately produce sentences, irrespective of their syntactic structure. To explore this further, additional analyses will be conducted with a more detailed coding of IWA's overt responses in sentence production. Findings from these additional analyses will allow us to determine whether the effect of canonicity varies between modalities in IWA. Results will be discussed within the framework of language production and comprehension models.

2-31: The encoding of speech modes

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Depending on the communication context, speakers can modulate their way of speaking (e.g. whispering or speaking loudly). It remains unclear whether changing from standard speech involves an additional encoding cost and which speech encoding processes allow speakers to change the speech mode (Guenther, 2016; Van der Merwe, 2021). This study investigates the complexities of motor speech encoding, exploring the impact of unconventional speech modes-whispered and loud speech-on pseudo-words production in terms of response times (RTs), acoustic durations, and automation effect. 80 French-speaking adults participated in four experiments comparing normal to whispered and loud speech under various conditions. A delayed production task was used, either combined or not with an articulatory suppression, known to tap into different motor speech encoding processes: speech planning (with articulatory suppression task, Laganaro & Alario, 2006) and programming (without articulatory suppression task, Jouen & Laganaro, 2023). The results reveal a cost in the production of modulated relative to normal speech across all experiments (with or without articulatory suppression task, in whispered or loud speech), either in terms of initiation latencies, automation throughout the task, or acoustic duration. The acoustic results are very clear and reveal throughout all the experiments a significant difference in the duration of speech sequences, with longer durations for modulated speech (whispered or loud) than for normal speech. As for the process underlying the encoding cost, the results are less clear. A cost in RTs is observed only in experiments in which normal versus modulated speech were produced during an articulatory suppression task (slower RTs for whispered/loud compared to normal speech), which suggests that the observed processing cost of modulated speech might be located at the speech planning processing stage. However, a lack of automation/learning effect during the task in modulated speech is observed in all experiments : RTs do not decrease across trials in the modulated mode, and they rather increase in experiments without articulatory suppression task, while a task-related automation effect revealed by the decrease of RTs across trials is observed in normal speech mode. All together, the current results suggest that encoding speech modes involves a processing cost relative to normal speech, although they may not allow to define which exact motor speech encoding processes generate the cost. Further investigation may take advantage of the different types of motor speech disorders and/or of neuroimaging approaches to disentangle the motor speech encoding processes underlying the adaptation of speech modes.

2-32: The Multiple-lemma Representation of Chinese Compound Words

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This study on speech production specifically targets the lemma level to investigate whether compounds (e.g., 公鸡 /gong1ji1/ ”rooster”) are exclusively stored in a non-decomposed, holistic format (e.g., 公鸡 /gong1ji1/ ”rooster”) at the lemma level, endorsing a single-lemma representation account or if they are also stored in a decomposed format (e.g., 公 /gong1/ ”male” and 鸡 /ji1/ ”chicken”), supporting multiple lemma representation accounts. In a behavioral picture-word interference (PWI) task, thirty-six native Mandarin Chinese speakers overtly named 45 pictures corresponding to disyllabic compounds. Three types of visual distractors were presented: synonyms (e.g. 雄 /xiong2/ ”male”), words that have the same meaning but differ in the phonology and orthography of the compound’s first morpheme, aimed to explore the lemma processing of the first constituent. Semantically related distractors (e.g., 鹅 /e2/ ”goose”), associated with the entire compound, were utilized to assess semantic processing and access to the holistic lemma of the compounds. Unrelated distractors (e.g. 车 /che1/ ”car”) served as the control group. The findings revealed that naming latencies in the synonym distractor condition were significantly shorter than those in the control group while naming in the semantically related distractor condition led to significantly longer latencies compared to the control group. These findings suggest that the constituents of a compound are stored as separate lemmas in our mental lexicon beside a holistic single lemma of the compound. This supports the idea of a multiple-lemma representation of compounds in the Mandarin lexicon.

2-34: The role of semantics and phonology in the Arabic root facilitation effect: A picture-word-interference study

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In Semitic languages like Hebrew and Arabic, surface word forms are derived from a morphological unit known as the root. The root is commonly made of three consonants and carries information about the semantic field of the word (e.g. k-t-b 'writing'). Given that words sharing the same root usually overlap in phonology and share the same semantic field (kitaab 'book', maktaba 'library'), the question arises of whether the root acts as a functional unit during language processing, independent of phonological and semantic processing.

Studies examined the role of the root during word production in Hebrew using the picture-word-interference paradigm (Deutsch, 2016; Deutsch & Meir, 2011; Kolan et al., 2011). In this paradigm, participants name pictures while ignoring distractor words. Pictures were named more quickly when distractors and targets shared the same root. In the present study, we ask whether this root facilitation effect can be explained by mere phonological and semantic overlap. In Indo-European languages, many studies have indeed shown that pictures can be named more quickly when distractors and targets overlap in phonology (carrot-castle) or when they are semantically associated (nest-bird). In a pilot study with 45 participants, we reproduced the root facilitation effect in Arabic (-106 ms, -133.61 – -80.10) and found that naming latencies also decreased when distractors overlapped in phonology (see Deutsch & Meir, 2011 for similar findings, but see Kolan et al., 2011 for absence of phonological effect). The present study aims to replicate these findings and add a new semantic condition, to determine whether root facilitation is more than the sum of phonological and semantic facilitation.

Speakers of Arabic will name pictures with superimposed distractors that (1) share the same root (e.g. maktaba 'library', kaateb 'writer'), (2) share phonemes in a way that reproduces the type of overlapping phonemes in the shared root condition (e.g. t'-r-q in mat'raqaˤ 'hammer', bat'riiq 'penguin'), (3) share the same type of semantic associative relationship found between targets and distractors in the shared root condition (e.g. maktaba 'library', qaareʔ 'reader') and (4) are unrelated. If the root acts as an independent functional unit, we expect the facilitation effect (time to start producing the target word in the unrelated minus in the related condition) in the shared root condition to exceed the sum of facilitation effects in the shared phonology and shared semantic relationship conditions.

2-35: The timing of orthographic input presentation at the onset of L2 acquisition

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Introduction and aims

Learning a new language (Ln) within a formal context often involves exposure to both written and spoken language from the early stages of acquisition, with the prevalence of written input. The dual exposure to two input types during schooling implies the simultaneous development of Ln written and oral language skills. However, the consequences of learning both modalities simultaneously and of the predominance of the written modality for spoken and written production are not well understood yet. This study aims at investigating the effect of a sequential versus a simultaneous exposure to orthographic input on the learning and the subsequent spoken and written production of Ln words.

Method

Two groups of 40 Spanish-speaking adults learn two lists of 20 Ln words, containing one of two vowels (/y/ or /ø/) that are not present in Spanish. Each of these vowels is associated either with a conflicting orthographic form or with a non-conflicting orthographic form.

The experiment is divided in 5 sessions, on 5 different days. As lexical knowledge is consolidated after a night's sleep, the learning phases are spread over two days to make sure that participants learn the new words (20 novel words in each learning phase).

In a first Learning phase, a picture, along with its auditory and written word forms is presented to the Simultaneous Group whereas the Sequential Group is presented with the auditory word forms only. In a second Learning phase, a picture, along with its auditory and written word forms is presented to both groups.

The day after the learning phases participants are tested on their spoken production with a picture naming task. On the last day, they are also tested on their spoken and written production in a reading task and a dictation task, respectively (on trained and untrained words).

The relevant contrasts are: 1) Simultaneous group vs. Sequential group, 2) conflicting vs. non-conflicting orthography and 3) trained vs. non-trained items. For all tests, the dependant measures are spoken and written response accuracy, processing speed (RT), production durations and spoken pronunciation accuracy (vowels' first and second formants (F1/F2).

Predictions

The Simultaneous Group will learn more words and name them faster than the Sequential group, when the latter has not yet been exposed to orthography. When exposed to orthography, the Sequential group will a) have developed better phonological representations in the absence of orthography and b) mapped them efficiently to the corresponding grapheme.

2-36: Variability in Representing Partner Utterances: Investigating Simulation of Partner Responses in a Shared Conceptual-Semantic Task

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When producing language in shared task settings, task partners have been shown to represent not only their own utterances, but also the utterances of their partners (Baus et al., 2014). Partner representations may entail an internal simulation of the partner's speech, potentially affecting own lexical access and retrieval speed (e.g., Hoedemaker et al., 2017; Kuhlen & Abdel Rahman, 2017). Recent research, however, reveals significant variability in whether, and on what level of detail, a partner's utterances are simulated and represented. Some studies have found no evidence of such representation (Kuhlen & Abdel Rahman, 2022), while others indicate only a limited degree of simulation (e.g., Brehm et al., 2019; Gambi et al., 2015; Hoedemaker & Meyer, 2019). We have suggested that, in communicative tasks, partner's utterances may be predominantly represented conceptually (Kuhlen & Abdel Rahman, 2021). To further explore this idea, the present study examines the representation of a partner's actions in a shared conceptual-semantic task. In this online study (N= 64) participants took turns with a virtual task partner classifying objects as ”natural” or ”manufactured”. In single-subject settings, response times have been shown to decrease with each successive picture classified within the same semantic category (Belke, 2013; Doering, Lorenz & Abdel Rahman, 2022). Our data replicate this cumulative semantic facilitation effect, even when pictures from the same semantic category are interspersed at considerable intervals. However, we found no evidence that participants internally represented their partners' responses. This study adds to the mounting evidence suggesting that a task partner's utterances are not consistently simulated. It raises important questions about how and under what conditions a partner's verbal actions are internally represented and influence an individual's own language production.

2-37: Within- and Between-Session Reliability of Naming Latencies and Event-Related Potentials During Picture Naming in Young and Older Adults

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Aging effects on language production have been investigated using picture naming tasks, where participants' performance on the task (i.e., accuracy and naming latencies), and sometimes the electroencephalographic signal during the task, are obtained from a single experimental session. The performance of older individuals is then compared to that of younger adults. Testing participants in a single session implies that participants' performance is generally consistent over time, i.e., reliable. While young adults' performance during picture naming has been found to be reliable both across trials and testing sessions (Fuhrmeister et al., 2024), little is known about how consistent the performance of older individuals is. It has been shown that older participants can perform just as accurately as younger participants in naming tasks but, in order to do so, they need to recruit additional neuro-cognitive resources (e.g., Wierenga et al. 2008). The recruitment of additional resources predicts that older participants will show greater variability across trials compared to young adults, and that their performance might depend on the day of testing. Increased performance variability in older individuals would also be in line with studies on cognitive aging reporting trial-by-trial fluctuations in reaction times on attention and executive control tasks in older adults (West et al., 2002; Bunce et al., 2004). Since language production has been argued to partly rely on executive control (Higby et al., 2019) and attentional resources (Roelofs and Piai, 2011), one could expect older individuals to show higher performance variability compared to younger adults during picture naming tasks too. The aim of this planned study is to compare the consistency of young individuals' and older individuals' response latencies and event-related potentials (ERPs) across trials and over time during a picture naming task. To do so, we will measure and compare split-half (within-session) and test-retest reliability (between-sessions) in a group of young adults (20–25) and healthy aging individuals (aged 70–75). Split-half reliability will be calculated by correlating each individual's naming latencies and ERPs in even and odd trials within a test session. Test-rest reliability will be determined by correlating individual-level naming latencies and ERPs across two testing sessions that occur 7–10 days apart. We predict that the performance of older individuals will be less consistent across trials and sessions compared to that of young adults.

MULTIPLE SPEAKERS

Beyond One Speaker: From Speaking to Interacting

Anna Kuhlen [1]

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Language in social interactions is a collaborative endeavor aimed at achieving common goals. In my presentation, I will explore how the interaction with a partner during a shared language task influences the selection and production of words. Joint action theories suggest that individuals working together on a task predict and align with each other's actions by internally simulating them. This concept has been supported by joint picture-naming studies, which indicate that one's ability to access words can be disrupted by simulating a partner's word selection process. However, recent studies question the consistency with which speakers integrate their partner's verbal actions into their own cognitive processes, challenging the extent to which a partner's verbal actions are simulated, and the level of detail at which these actions are simulated. I propose that in certain settings, participants in a collaborative task lean more on the structured division of the task, distributing its components to simplify their own contributions. The latter part of the talk will explore how not only the actions of a partner, but also specific characteristics known about the partner, can shape the word selection process. I will conclude by discussing the implications of these findings for our understanding of how language is produced within the context of social interactions, highlighting the balance between individual cognitive processes and collaborative dynamics in language use.

Crowdsourcing Dialect Data: It's Quick, but Is It Dirty?

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Crowdsourcing, the practice of obtaining information from a large number of people typically via the internet, is increasingly being used to collect dialect data (e.g. Leeman et al 2018). But given the relatively uncontrolled context in which data are collected, how reliable is crowdsourcing in documenting the complexities inherent in language variation? In this paper we address this question by presenting findings from a new digital resource Speak for Yersel speakforyersel.ac.uk. This public-facing resource sets out to map dialect use throughout Scotland by asking speakers a series of questions about their use of Scots lexical, phonetic and morphosyntactic forms. The analysis focusses on responses from c5000 users generated in the first two weeks of the resource launch and addresses a range of questions with respect to the types of data that can be gathered in this way, including sampling and speakerhood. We then turn to the key question of whether socially and linguistically nuanced patterns of variation can be revealed in the context of a necessarily 'simplified' public engagement resource (e.g. Labov 1996). Results across a number of variable dialect forms pattern with those reported in research which employ carefully designed face to face data collection protocols (e.g. Jamieson et al, in press). The paper ends with a discussion of the possibilities and limits of crowdsourced data in documenting the complexities of dialect variation.

Jamieson, E, Smith, J., Adger, D., Heycock, C., and Thoms, G. (in press). When intuitions (don't) fail': Combining syntax and sociolinguistics in the analysis of Scots. English Linguistics.

Labov, William. (1996). When intuitions fail. In Lisa McNair, Kora Singer, Lise Dobrin & Michelle Aucon (eds.), CLS 32: Papers from the parasession on theory and data in linguistics, 77–106. Chicago: Chicago Linguistic Society.

A. Leemann, M.J. Kolly, D. Britain (2018). The English Dialects app: The creation of a crowdsourced dialect corpus. Ampersand, 5 pp. 1-17

MULTIMODAL COMMUNICATION

The structure of the signed mental lexicon

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The past few decades of research have repeatedly demonstrated that sign languages are structured, learned, and used in much the same way as spoken languages. At the same time, there are important differences between the two modalities. In this talk, I'll explore two salient differences between the two modalities that play a unique role in shaping the mental lexicon: the phonological forms of signs are different from spoken words, and many signs are iconic and resemble their referents. I share an extensive analysis of the phonological and semantic structure of the lexicon, revealing systematic alignment between the two. I argue that iconicity is a driving force in this alignment and in the structure of the American Sign Language Lexicon, and point to places where theories of language processing may need to account for modality-specific vs. language-general phenomena.

Visual bodily signals as core coordination devices in face-to-face conversation

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Human language use is a coordination challenge par excellence. In order to achieve mutual understanding on both semantic and pragmatic levels, we must recipient-design our utterances, repair communication problems when they arise, and signal understanding. Moreover, conversational turn-taking is incredibly fast, thus creating a psycholinguistic bottleneck for processing incoming utterance information as well as preparing a timely response. In this talk, I will focus on how these processes fundamental to successful communication work in face-to-face interaction, where we use words as well as a plethora of visual bodily signals. Specifically, I will focus on the semantic and pragmatic contributions hand gestures and facial signals make when we produce utterances, as well as the effect they have on comprehension and the production of next utterances in face-to-face conversation.

The Gestural Origin of Language Production: Insight from the Baboons' Hands and Brain Specialization

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Language is an unique communicative system involving hemispheric lateralization of the brain. This lateralization is visible at the structural level, even at birth, in key cortical language areas, such as the perisylvian Planum Temporale, its main connecting fiber track with Broca's area - the arcuate fasciculus - and the STS. To discuss the question of language origins, I will highlight the works on the communicative gestures in our primate cousins and their brain correlates. Indeed, nonhuman primates mostly communicate not only with a rich vocal repertoire but also with manual and body gestures. In the last 20 years, we investigated this gestural system in the baboons Papio anubis, an Old World monkey species, as well as its lateralization and cortical correlates across development, using both ethological, psychological and longitudinal noninvasive in vivo brain imaging approach (MRI). In the present talk, I will summarize our main findings showing similar key intentional, referential "domain general" properties of language as well as some similar underlying structural hemispheric specialization including Broca, the Planum Temporale and the STS. I will also present our recent MRI longitudinal work documenting their brain ontogeny from birth and how they pave the way for the further emergence of gesture lateralization across development. It is thus not excluded that gestural signaling may have played a critical role in the phylogenetic roots of language brain organization and dated back, not to the Hominidae evolution, but rather to their much older Catarrhine common ancestor 25-40 million years ago.

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