The Multilingual Mind: lecture series on multilingualism across disciplines

Winter Semester 2021/2022
Tuesdays, 17.00 - 18.30 CET
Online

02.11.2021

Sergio Soares (University of Konstanz)

Neurophysiological oscillatory correlates of heritage bilingualism

Abstract

Bilingualism can result in a more fine-tuned executive control system and in structural and functional brain adaptations (see for a review Pliatsikas, 2019). However, the effects of bilingualism studied through the lenses of neural oscillations remain understudied. Here, I will present findings from two projects of my dissertation's work, comprising resting state EEG (rs-EEG) and time-frequency representations (TFRs) data. Rs-EEG activity (frequency power) is related to various cognitive functions and can estimate neurological connectivity (mean coherence) between brain regions. As such, it has emerged in the past few years as a complementary neuroimaging methodological option to investigate the effects of languages in the brain (Bice et al., 2020; Prat et al., 2016). On the other hand, research using TFRs has shown that executive function tasks (e.g. Flanker task - FT) modulate power within theta and alpha frequency bands. These power modulations have been linked to a greater engagement of the executive control system (Cavanagh & Frank, 2014). Herein, we use brainwaves to investigate how individual differences in bilingual language experience may modulate neurocognitive oscillatory outcomes.

EEG data for both tasks were collected from heritage speakers (HSs) and late L2 learners. All participants completed the Language and Social Background Questionnaire (LSBQ; Anderson et al., 2018), which quantifies language exposure and crucially the division of usage in diverse variety of activities and settings in the participants' two languages over the lifespan. We hypothesized degree of active bilingualism would predict changes in frequency bands (mostly in alpha and beta bands) in both early and late bilinguals at both the rs-EEG (power and functional connectivity) and task-based EEG levels.

We found main effects of Age of L2/2L1 onset on *high beta* and *gamma* powers (i.e., earlier acquisition resulted in higher beta and gamma frequencies) and higher exposure/usage scores from the LSBQ of the non-societal language at home modulated mean coherence effects (functional brain connectivity) in *theta*, *alpha* and *gamma* frequencies for the rs-EEG data. Similarly, individual differences analyses from the FT revealed significant correlations between age, age of acquisition, and usage of the non-societal language at home with *alpha* and *beta* band activity for late bilinguals, whereas only age effects were found in early bilinguals. Furthermore, when correlating *alpha* power with reaction times, early bilinguals showed a negative correlation while later bilinguals show a positive correlation.

Results are in line with claims that bilingualism effects are not monolithic, but rather indicate adaptations towards differential brain recruitment to deal with the cognitive demands associated with variation in language experience.

References

Anderson, J. A., Mak, L., Chahi, A. K., & Bialystok, E. (2018). The language and social background questionnaire: Assessing degree of bilingualism in a diverse population. *Behavior Research Methods*, *50*(1), 250–263.

Bice, K., Yamasaki, B. L., & Prat, C. S. (2020). Bilingual Language Experience Shapes Resting-State Brain Rhythms. *Neurobiology of Language*, *1*(3), 288–318.

Pliatsikas, C. (2019). Multilingualism and brain plasticity. In *The handbook of the neuroscience of multilingualism* (In J. Schwieter (Ed.), pp. 230–251). Hoboken, NJ: Wiley-Blackwell.

Prat, C. S., Yamasaki, B. L., Kluender, R. A., & Stocco, A. (2016). Resting-state qEEG predicts rate of second language learning in adults. *Brain and Language*, *157*, 44–50.

09.11.2021

Daniela S. Avila-Varela (Pompeu Fabra University)

Cross-language phonological overlap in bilingual toddlers

Abstract

Adult and young bilinguals co-activate their languages in different degrees, even in entirely monolingual tasks/contexts (Spivey & Marian, 1999; Von Holzen, Fennell, & Mani, 2018). Previous research has used cognate words as stimuli. Cognates are translations overlapping in their phonological form (e.g., English “chocolate” /tʃɒklət/ and the Spanish “chocolate” /ʧokolate/). Previously reported cross-language phonological effects cannot be attributed only to phonological overlap between labels because they also overlap at the conceptual level. Here, we analyse how phonological representations across languages influence word recognition of non-cognate words in three-year-old Catalan-Spanish bilinguals. We adapted the visual word paradigm by Chow, Aimola-Davies, & Plunkett (2017). Children saw four pictures after 4100ms of the start of the trial an absent target was named in Catalan, while children saw four pictures: A) a Catalan to Spanish phonological competitor (B) a Spanish to Catalan one, and C) two phonologically unrelated competitors to the absent target named. A logistic growth curve analysis of fixations up to 3000ms after word onset showed that children looked more at the phonologically related competitors through translation than unrelated competitors across the trial. These results support that young bilinguals activate phonologically related competitors (Catalan to Spanish and Spanish to Catalan) in their familiar languages even when no overt phonological overlap is presented.

16.11.2021

Desiré Carioti (University Milano Bicocca)

A Reading-Free Tool for the screening of developmental dyslexia in monolingual and minority language children

Abstract

Due to the increasing number of immigration flows, students with a foreign familial family, often exposed to two or more languages in the daily life experience are increasing in the Italian school classes.

Linguistic experience of these children can vary based on cultural habits, L2 linguistic skills of parents, numerosity of family, and so on, so they are not always skilled bilinguals, but, more specifically, minority language children (MLC) with some degree of exposure to a foreign language in the familial context.

Often these children underperform in reading skills compared to Italian monolinguals and show a learning profile similar to those of dyslexic readers (Azzolini et al., 2012). Nevertheless, the intrinsic linguistic nature of the reading process biases the assessment of MLC for learning disorders and does not allow to discern between the disorder or a difficulty due, for example, to a less extended vocabulary in L2.

For solving this issue, we developed a computerized "Reading-Free Screening Tool", aimed at testing children for cognitive markers of developmental dyslexia. The tool was conceived for significantly reducing the involvement of language and, for this reason, aligning with evidence in literature (Bonacina et al., 2015; Flaugnacco et al., 2015; Rautenberg, 2015; Swierk, 2018; Tallal & Gaab, 2006; Thomson & Goswami, 2008), precursors of phonological awareness (i.e., rhythmical skills) were tested together with executive functions and attentional processes, both in the auditory and visual modality.

Results of a first exploratory validation in both monolingual and minority language children will be presented, together with limits of the instrument and feature perspectives.

References:

- Azzolini, D., Schnell, P., & Palmer, J. R. (2012). Educational achievement gaps between immigrant and native students in two "new" immigration countries: Italy and Spain in comparison. *The Annals of the American Academy of Political and Social Science*, *643*(1), 46-77.
- Bonacina, S., Lanzi, P. L., Lorusso, M. L., & Antonietti, A. (2015). Improving reading skills in students with dyslexia: the efficacy of a sublexical training with rhythmic background. *Frontiers in psychology*, *6*, 1510.
- Flaugnacco, E., Lopez, L., Terribili, C., Montico, M., Zoia, S., & Schön, D. (2015). Music training increases phonological awareness and reading skills in developmental dyslexia: a randomized control trial. *PloS one*, *10*(9), e0138715.
- Rautenberg, I. (2015). The effects of musical training on the decoding skills of German-speaking primary school children. *Journal of Research in Reading*, *38*(1), 1-17.
- Swierk, K. G. (2018). Correlation Between Music and Preliteracy Skills in Preschool Age Children. *Scholarly Undergraduate Research Journal at Clark*, *4*(1), 5.
- Tallal, P., & Gaab, N. (2006). Dynamic auditory processing, musical experience and language development. *Trends in neurosciences*, *29*(7), 382-390.

- Thomson, J. M., & Goswami, U. (2008). Rhythmic processing in children with developmental dyslexia: auditory and motor rhythms link to reading and spelling. *Journal of Physiology-Paris*, *102*(1-3), 120-129.

23.11.2021

Elena Soare (University of Paris 8 & CNRS)

The acquisition of the morphosyntax of Heritage Romanian in a dominant French setting

Abstract

The speakers of a Heritage Language (HL) are bilinguals who learnt a language in their family, but this language is not the majority language of their society. (Montrul, 2016; Polinsky, 2018). One often assumes that in this situation we deal with an unbalanced bilingualism, in which the HL suffers a delay in acquisition, or might be incompletely acquired, and some structures may undergo attrition. Most of the time, Heritage Speakers (HS) participating in the studies are adults from the first or the second generation of immigrants, which leaves uninvestigated the early phase of the acquisition of these languages and does not allow to identify possible differences and correlations between the early linguistic development and what happens after the young HS begin schooling in the dominant language.

In this talk, we will present the first results of a pilot study on the acquisition of Heritage Romanian (HR) by children of Romanian immigrants in France (Parisian surroundings). Our goal is to identify some possible differences between the structures which are vulnerable in the acquisition of HR before schooling (age 5-7) and after the beginning of schooling in French (age 8-12), and we collected data from two relevant age groups. We try to answer three questions: (i) can we identify an unbalanced bilingualism in the early acquistion process? (ii) what structures are vulnerable? (iii) is there any difference between these structures in the two groups?

Our data come from the first corpus of "frog stories" recorded in HR in France (37 stories collected till now). The children follow a Romanian course in the north surroundings of Paris. We compare the HR of these children to the baseline and to monolingual children from mainland.

Our results indicate a difference between HS of Romanian in the younger group and those who have already began schooling in French. Only the latter exhibit an unbalanced bilingualism. The vulnerable structures are, in the case of 5-7 years olds, the same as in monolingual acquisition. Older bilinguals, in turn, show the impact of the dominant language (transfer) in these structures, more precisely properties situated at the interface of syntax and discourse, syntax and morphology, and structures with a complex syntactic derivation. Here, we will investigate in particular relative clauses and Differential Object Marking.

30.11.2021

Tess Fitzpatrick (Swansea University)

Applied linguistics in minoritised language contexts: three case studies from Wales

Abstract

In this lecture I present three applied linguistics projects which are not only situated in, but also motivated by, the linguistic environment of Wales, a bilingual country in the UK. The Welsh language is classed as 'vulnerable' in the UNESCO taxonomy of endangered languages; aspects of policy, infrastructure and culture lend some linguistic security, and the Welsh

Government's ambition to double the number of Welsh speakers to 1 million by 2050 has generated new engagement with applied linguists. In partnership with colleagues, practitioners and community members, I have worked on a number of projects relating to pedagogy, language resources, and better understanding the bilingual lexicon. Methodologies we employed include word association experiments, corpus creation, practitioner surveys and scrutiny of research literature and policy reports. I will discuss both our headline findings and the more implicit messages from our work, and consider how these might inform continuing research into bilingualism and minoritised language communities.

14.12.2021

Juhayna Taha (University Milano Bicocca)

What is wrong with rhythm in developmental dyslexia?

Abstract

Individuals with developmental dyslexia (DD) are a heterogenous group and may exhibit co-occurring deficits that go beyond reading itself. Beside the well-recognized weak phonological skills, some children with DD show ideficits in oral language skills (McArthur et al.,2000) and language processing (e.g., Cantiani et al., 2013). Moreover, individuals with DD show motor skill deficits (see Nicolson & Fawcett 2011) such as motor control difficulties in handwriting (Pagliarini et al., 2015). Impairments in rhythm perception and production are also evident in individuals with DD (see Ladányi et al., 2020).Importantly, converging evidence has identified a link between rhythmic abilities and language processing, handwriting and reading in typical and atypical populations (e.g., Corriveau & Goswami, 2009; Friederici et al., 2003; Gordon et al., 2015a; Pagliarini et al., 2015). In this talk, I discuss the idea that that rhythm, as also proposed by other researchers, is key to understanding the reading, language and motor difficulties in individuals with DD. I will review the body of research on rhythmic deficits in individuals with DD across different cognitive domains. Then, I will discuss our view that a deficit in anticipation (a rhythmic component) impairs reading, some motor activity, as handwriting, rhythmic processing and language. This hypothesis will be referred to as the Inefficient Anticipation Hypothesis. New evidence on the role of rhythmic deficits in the identification of DD in L1 and L2 Italian-speaking children with DD will also be presented.

11.01.2022

Ana Belén García Gámez (University of Algarve)

Gestures as scaffolding to learn vocabulary in a foreign language

Abstract

In two experimental studies we explored the role of gestures on foreign language (FL) vocabulary learning. First, we evaluated the impact of gestures on nouns (Experiment 1) and verbs learning (Experiment 2). Four training methods were compared: The learning of FL words with congruent gestures, incongruent gestures, meaningless gestures, and no gestures. Better vocabulary learning was found in both experiments when participants learned FL words with congruent gestures relative to the no gesture condition. This result indicates that gestures have a positive effect on FL learning when there is a match between the word meaning and the gesture. However, the recall of words in the incongruent and meaningless gesture condition was lower than that of the no gesture condition. This suggests that gestures might have a

negative impact on FL learning. I will analyze these results in terms of FL learning facilitation and interference effects.
However, a question remained, do we have to perform the gestures ourselves to observe the learning improvement? A third experiment addressed this topic directly. Participants were divided in two experimental groups. In one group, the participants learned the words by performing gestures ("do" teaching group) and the other group only had to observe the gestures performed by others ("see" teaching group). Compared to the meaningless gesture condition, the processing of congruent gestures facilitated the recall of FL words in the "see" and "do" teaching groups. However, the interference effect associated with the processing of incongruent gestures was greater in the "see" teaching group than in the "do" teaching group. Thus, the performance of gestures seems to mitigate the negative impact that the use of gestures may have on the teaching of vocabulary in a FL.
Taken together, iconic gestures might be a good tool to learn new vocabulary in a FL when the gestures and words meaning match. In addition, the gestures performance mitigates negative effects associated with meaning mismatches. Hence, if one has to choose, a FL learning strategy based on the performance of congruent iconic gestures would be desirable.

18.01.2022

Narly Golestani (University of Geneva)

Language processing in the healthy, multilingual and expert brain

Abstract

There are large individual differences in speech and language processing skills at different levels of the linguistic hierarchy, and these are likely modulated by experience-dependent plasticity but also by possible differences in innate predisposition. I will provide an overview of a body of research in which we have explored brain functional and structural differences underlying speech and language processing, in the context of healthy individual differences but also extending to multilingualism, to language expertise (e.g. in phoneticians and simultaneous interpreters) and to dysfunction (e.g. in dyslexia and aphasia). In this context I will also describe our rapidly growing body of work on variation in auditory cortex anatomy and phonetic learning, dyslexia, aphasia and musicianship, and describe how we plan to explore the relative influences of nature vs nurture on these individual differences, across the lifespan.

25.01.2022

Konstantina Olioumtsevits (Aristotle University Of Thessaloniki)

Properties of the L2 lexicon in refugee children: Evidence from a word association task in Greek

Abstract

Vocabulary knowledge can be characterised by three dimensions: size, depth, and organisation (Meara, 1996). The present study mainly focuses on the investigation of the lexicon on an organisational level, namely on connections between words. The comparison between L2 and L1 lexicon based on word association patterns has drawn great research attention, with previous empirical findings revealing similarities and differences between L2 and L1 speakers (e.g., Fitzpatrick, 2006). However, there has been restricted focus on primary school age children

while the exploration of L2 learners with a refugee background is also greatly unexplored. Therefore, the aim of the present study is to bridge this gap in the literature.

Fifty-two L1 Arabic-, Farsi-, and Kurdish-speaking children (23 females) with a refugee background participated in the current study. They were between the ages of approximately 7 to 13 (M = 10.2, SD = 1.6) and were all attending Greek reception classes in primary schools in the region of Thessaloniki (Greece) for 8.5 months on average (SD = 5.4). The pupils completed an off-line word association task that was orally administered. Every time the child was presented with a stimulus word, they needed to provide one or more words that came to their mind in connection to the former. Although the researcher pronounced the stimulus word in Greek, the child could respond not only in Greek but also in their L1 or in English. The task included 48 stimulus words in total. Besides the main above-presented task, a background questionnaire as well as background tasks addressing cognitive and L2 linguistic abilities were also administered.

The word association responses were categorised based on Fitzpatrick (2006), Fitzpatrick et al. (2015), Fitzpatrick & Izura (2011), Doró (2009), as well as based on the responses elicited in our study. Descriptively- and statistically-based findings will be presented also in relation to previous relevant studies in the field. Moreover, the performance of the L2 students with a refugee background will be discussed in comparison to that of a control group of 51 age matched L1 Greek children (23 females).

References

Doró, K. (2009). L2 productive vocabulary and mental lexicon in light of a word association task. In Z. Lengyel & J. Navracsics (Eds.), *Studies on the mental lexicon: Language acquisition – speech production – speech perception* (pp. 30-40). Budapest: Tinta Kiadó.

Fitzpatrick, T. (2006). Habits and rabbits: Word associations and the L2 lexicon. *EUROSLA Yearbook, 6*, 121-145.

Fitzpatrick, T., & Izura, C. (2011). Word association in L1 and L2: An exploratory study of response types, response times and interlingual mediation. *Studies in Second Language Acquisition, 33*, 373-98.

Fitzpatrick, T., Playfoot, D., Wray, A., & Wright, M. J. (2015). Establishing the reliability of word association data for investigating individual and group differences. *Applied Linguistics, 36*(1), 23-50.

Meara, P. M. (1996). The dimensions of lexical competence. In G. Brown, K. Malmkjaer, & J. Williams (Eds.), *Performance and competence in second language acquisition* (pp. 35-53). Cambridge: Cambridge University Press.

01.02.2022

Joe Barcroft (Washington University in St Louis)

Patterned effects of acoustically varied input on vocabulary learning and speech processing

Abstract

Acoustic variability refers to variations in speech that do not alter linguistic content, such as when a word is produced by multiple talkers instead of a single talker. This presentation focuses on research and theoretical advances on how acoustic variability affects both lexical acquisition and speech processing. We first consider how vocabulary learning is positively affected by most, but not all, of the following five sources of variability: talker, speaking style, speaking rate, amplitude, and fundamental frequency (F_0). We then indicate how each of these sources of variability affects speech processing, based on studies on accuracy and reaction time for word identification. An interesting pattern emerges in that only those sources found to positively affect vocabulary learning also pose costs during speech processing whereas sources that do not positively affect vocabulary do not pose costs to speech processing. This pattern of effects is consistent with predictions of the *extended phonetic relevance hypothesis* (EPRH), which posits that acoustic variability based only on linguistically relevant sources affects both vocabulary learning and speech processing. The final part of the presentation spotlights studies designed to test the EPRH directly and shares a model of how phonetically relevant acoustic variability affects developing mental representations of word forms and processing of spoken words across the lifespan.