TIME	EVENT	AUTHORS	TITLE	ABSTRACT
9:00-9:30	Registration			
9:30-10:30	Invited talk 1	Jubin Abutalebi (University Vita-Salute San Raffaele)	Neuroanatomical perspectives on bilingualism and language experience	In the last two decades there has been an upsurge of research on the bilingual mind and brain. Although the world is multilingual, only recently have cognitive and language scientists come to see that the use of two or more languages provides a unique lens to examine the neural plasticity engaged by language experience. But how? Bilinguals proficient in two languages appear to speak with ease in each language and often switch between the two languages, sometimes in the middle of a sentence. This uniquely bilingual ability necessitates efficient control resources in order to avoid unwanted interferences from the unrequested language. During my talk, I will first outline the neural bases of control that enable individuals to speak each of their two or more languages and will then focus on the consequences that these control mechanisms might hold more generally upon the brain. Evidences for structural and functional changes in the brains of young and older subjects who use two or more languages across their entire lives will be considered. I will also show how eventually individual neuroanatomical differences between subjects may be responsible for behavioral and cognitive differences. Finally, I will assess the broader implications for what bilingualism tells us about life experience and brain plasticity in general.
10:30-10:50		Lihua Xia (University of Edinburgh), Thomas H. Bak (University of Edinburgh), Antonella Sorace (University of Edinburgh), Mariana Vega-Mendoza (2Umeå University, Umeå, Sweden)	Bilingualism and Cognitive Functions	There is a debate on whether bilinguals outperform monolinguals on a variety of tasks involving cognitive functioning. This study aims at examining potential differences in young adults through three well-established non-verbal cognitive tasks: Attention Network Task (ANT), Number Stroop task, and The Test of Everyday Attention (TEA). Given that language learning involves multiple domains, i.e. visual (reading and writing) and auditory (speaking and listening), the tasks employed in our study are based on the measurement of different components. Overall, bilinguals outperformed monolinguals on both visual and auditory attention tasks, but in a selective way. Specifically, in the visual domain, bilinguals displayed a smaller switching cost and faster disengagement of attention (SCE; sequential congruency effect) on the ANT, and a smaller conflict effect on the Stroop task compared to monolinguals. No group differences were found on the other aspects of ANT (Alerting, Orienting, and Conflict) and Stroop (Switching cost and SCE). The latter observation suggests that individuals' performance on the attention tasks might be modulated by the characteristics of the tasks (i.e. complexity level and stimulus interval time). In the auditory domain (TEA), both groups showed similar performance on selective attention but bilinguals performed better in the attentional switching subtask, which suggests that the differences between monolinguals and bilinguals are

				specific. In sum, our results demonstrate that bilingual experience could have some selective positive effects on cognitive functions even in young adults who are supposed to be at the peak of their cognitive capacities.
10:50-11:10		Mikhail Ordin, Leona Polyanskaya, David Soto (BCBL)	Metacognitive processing in statistical learning is modulated by bilingualism	In multiple experiments, we assessed the effect of bilingualism on metacognitive processing in language tasks. Following a study phase in which participants were exposed to the artificial language, segmentation performance was assessed by means of a dual forced-choice recognition test followed by confidence judgments. We used a signal detection approach to estimate type-1 performance (i.e., the participants' ability to discriminate statistical words vs. foils constructed from the same syllables), and type-2 metacognitive performance (i.e. the ability to discriminate the correctness of the type-1 decisions by confidence ratings). The material in the first two experiments varied in the difficulty level to segment the language. The results showed that bilinguals and monolinguals do not differ in type-1 recognition performance, but across the two experiments metacognitive performance was higher in bilinguals compared to monolinguals. The results also show that bilingualism improves metacognitive evaluation of performance in linguistic domains. We suggest that the improvement in metacognitive performance stems from bilinguals' enhanced error monitoring abilities in the language domain, evidenced by lower confidence rating assigned to incorrect trials by bilinguals compared to monolinguals. In the last set of experiments, we looked at different aspects of bilingualism that could modulate individual metacognitive performance in statistical learning tasks. Although the experiments are still running, the results so far indicate that individual differences in flexibility and use of language-control processes play a more important role in modulating metacognition in language tasks than linguistic proficiency in multiple languages.
11:10-11:30		Ramesh Mishra (Center for Neural and Cognitive Sciences, University of Hyderabad), Manasa Padmanabhuni (Center for Neural and Cognitive Sciences, University of Hyderabad), Pratik Bhandari (Center on Cognition, Brain and Language, Sebastian, Spain), Shiji Viswambharan (IISER Thiruvananthapuram), Seema Prasad (Center for Neural and Cognitive Sciences, University of Hyderabad)	Second language proficiency and executive control in ageing bilinguals : Now we see and now we don't	The idea that a cognitive skill like using two or more languages should lead to noticeable neuroplasticity in adults or children has become controversial in the last few decades. Although a range of behavioural and neural data indicate that bilinguals perform better on cognitive control tasks, the lack of diversity in the population studied has led to unclarity on the advantage claim. Reports from India based on hospital records (eg., Alladi et al., 2013) of patients have shown "cognitive reserve" - the late onset of neurodegenerative diseases - in bilinguals. If this is true, the older individuals who practise bilingualism should outperform monolinguals on cognitive control tasks. To test this, we examined older Telugu -English bilinguals (age range: 50 - 65 years) in Hyderabad on a range of executive control tasks (ANT, stop-signal, numerical Stroop, DCCS). Following previous observations, we tested whether enhanced second language (L2) proficiency leads to better performance on executive control tasks. Interestingly, there was no such evidence which was also confirmed by

				Bayesian null hypothesis testing and parameter estimation. This result can be attributed to the fact that the participants in this sample had retired from their jobs, were mostly at home and not practising bilingualism anymore. In contrast, previous studies from our lab with young, university-going, adult bilinguals have repeatedly shown better executive control in bilinguals as a function of L2 proficiency (eg., Singh & Mishra, 2012, 2013). This suggests that cognitive reserve arising out of bilingualism in older adults might be an outcome of constant practise of bilingualism. This first report shows experimental outcomes in ageing bilinguals in India and can add meaningfully to data from studies that have considered hospital records of patients with neurodegenerative diseases.
11:30-12:00		COFFEE BREAK		
12:00-13:00	Invited talk 2	Viorica Marian (Northwestern University)	How Bilingualism Changes Linguistic, Cognitive, and Neural Processing	The majority of the world population is bilingual or multilingual. In this talk, I will discuss how learning another language changes the human linguistic, cognitive and neural architectures. I will show that a bilingual's two languages constantly interact and influence each other. Bilinguals' experience managing two languages sculpts the brain and translates to changes not only in the domain of language (such as language learning and processing), but also in other domains (such as executive function, visual search, and audio-visual integration). Using eye-tracking, mouse-tracking, EEG, and fMRI data, I will show that the highly interactive and dynamic nature of bilingual language processing results in profound changes to cognition and the brain.
13:00-13:20		Sergio Pereira Soares (University of Konstanz), Vince DeLuca (University of Birmingham), Toms Voits (University of Reading), Ellen Bialystok (York University), Anastasia Christakou (University of Reading), Christos Pliatsikas (University of Reading, Universidad Nebrija), Jason Rothman (UiT the Arctic University of Norway, Universidad Nebrija)	Beyond Structure: Investigating neurochemical bases for bilingualism-induced neural plasticity	Neurobiological and neurochemical processes that underlie degree of brain adaptation to specific (bilingual) language experiences are understudied. The concentrations of certain metabolites, such as choline and creatine, have been found to relate to the degree of plasticity in regions of the brain (Chiu et al., 2014). In consideration of the literature that documents bilingual neuroanatomical adaptions (see Pliatsikas, 2019), it is fair to expect metabolite differences as well. To date, however, virtually no studies have examined effects of bilingualism on metabolite concentrations. Weekes et al. (2018) is the only Magnetic Resonance Spectroscopy (MRS) study—a method that collects metabolite concentration during MRI scanning. They, however, examined the anterior cingulate cortex (ACC) and in older (ageing) bilinguals. We employ MRS to identify potential neurochemical basis for bilingual-induced brain adaptations in the left caudate nucleus (LCN). The LCN is an area of the brain implicated in both language processing and control networks that shows effects of potential amelioration from bilingualism (Abutalebi & Green, 2016). We specifically assess whether metabolite concentrations are a) distinct between monolinguals and

				bilinguals, b), if so, predicted by specific language use factors within the bilingual experience, and c) whether there is a modularity connection to adaptations seen in the MRI scanning. 75 participants (42 bilingual and 33 monolingual) were scanned. Participants also completed a language background questionnaire (LSBQ, Luk & Bialystok, 2013) from which we derive regressors of bilingual language experience. Preliminary results show correlations between length of bilingual language use and concentrations of specific metabolites, specifically glutamine and glutamate, indicating a modulatory role of language experience on neurochemical concentrations.
13:20-13:40		Nur Basak Karatas (University of Maryland), Kira Gor (University of Maryland), Ellen Lau (University of Maryland) and Mehmet Aygunes (Istanbul University)	L1 and L2 Morphological and Morphosyntactic Processing of Case: ERP Evidence from Turkish	In languages with overt case-marking, different case forms may drive differential processing costs for both native (L1) and non-native (L2) speakers, but it can be difficult to determine whether these costs reflect morphological processing at the lexical level or syntactic processing at the sentence level. This study compares L1 and L2 behavioral and neural responses for the same case-inflected nouns in reading, both in a lexical decision task (LDT) and in sentence comprehension with a grammaticality judgment task (GJT). The study explores responses to nominative, accusative, dative, genitive marked nouns in L1 speakers (n=37) and advanced L2 learners (n=26) of Turkish, an agglutinative head-final language. We also examined responses to violations of the object case selected by the verb (accusative vs. dative). LDT results indicate that both groups showed sensitivity to the morphological structure of different case-inflected nouns, modulated by the case form and its status within the inflectional paradigm (see Gor, Chrabaszcz, & Cook, 2017). RTs were increased for genitive-marked nouns, and ERPs showed increased negativities for this condition; in L1 this ERP pattern also appeared to extend to sentence contexts. Case violations detectable at the verb produced distinct neural patterns in L1 and L2 processing. In L1, ungrammaticality was indexed by a larger negativity between 300-500ms and a larger late positivity, whereas in L2, the early negativity was primarily modulated by grammaticality for the accusative case only, and no late positivity was observed. These results indicate poor integration of morphosyntactic features in sentence comprehension by L2 learners.
13:40-14:00		Wilhelmiina Toivo, Christoph Scheepers (University of Glasgow)	Comparing cognitive and physiological measurements of reduced emotional resonance in bilinguals' L2	Reduced emotional resonance of second language (L2) is often studied using cognitive behavioural paradigms such as lexical decision task (LDT). These findings are inconclusive, while physiological measurements seem to detect reduced emotional resonance consistently. The aim of our experiment was to compare physiological measurement (pupillometry) and an LDT using a well-controlled stimuli set to see which method is more reliable. 30 German-English bilinguals completed a pupillometry task and an LDT in English (L2) and in German (L1). 30 English monolinguals completed both tasks in English. We selected 40 neutral valence/low arousal, 40 positive valence/high arousal, and 40 negative valence/high arousal words, matched on length,

			lexical frequency and concreteness across conditions and languages. In the pupillometry task, participants' pupillary response to the words were measured. In the LDT, reaction times (RTs) were measured as participants decided whether each stimulus was a word or not. LDT data, analysed with Mixed Effect Models, showed no change of cross-condition effects (difference between neutral vs. the other two conditions) dependent on test language (model comparison with language:condition interaction included and excluded: $X2(2)=0.88$, $p=0.64$). Thus, the LDT failed to detect reduced emotional resonance in L2. The pupil data are still being analysed; based on previous findings we expect reduced effects of arousal in L2. If found, this would suggest that detectability of reduced emotional resonance is task-dependent.
14:00-15:30		LUNCH & POSTERS	
15:30-16:30	Invited talk 3	Gigi Luk (McGill University)	Beyond Group Comparisons: Understanding Bilingualism And Its Role In Development And Learning	Research on bilingualism and cognition has adopted group comparisons between bilingual and monolingual individuals. This knowledge has contributed to identifying behavioral differences in language and cognition. While group comparisons are elegant and efficient, it is not sufficient to understand the experiential complexity involved in bilingualism and how this developmental process shapes learning. Given bilingualism is becoming a prevalent global phenomenon, innovative approaches are needed to evaluate the developmental and learning outcomes of bilingualism, an interactive experience between an individual and her language environment. Examining bilingualism as an interactional experience poses an opportunity to conduct translational research that informs learning and educational practices. The study of bilingualism will benefit from transdisciplinary efforts and connection to real life implications. In this talk, I will share a research program that is designed to address an educational challenge by examining the neural and cognitive mechanisms supporting learning through spoken language in adolescents.
16:30-16:50		Cristy Sotomayor (San Diego State University and University of California San Diego), Alyson Abel (San Diego State University), Mandy Maguire (University of Texas at Dallas)	Do Bilingual and Monolingual School-Aged Children Use Different Neural Mechanisms During Word Learning?	Bilingualism has been shown to facilitate word learning in adults [1, 2]. However, whether this same word learning difference is present in school-aged bilingual children is not certain. In the present study, we used behavioral and electroencephalography (EEG) methods to investigate whether language experience (i.e., maintaining one language versus two languages) is associated with different neural mechanisms during word learning in monolingual and bilingual school-aged children. For this study, 21 (10 bilingual, 11 monolingual) children, matched on age, socioeconomic status (SES), and language proficiency, completed standardized language and cognitive assessments and a word learning task during which their EEG was

				recorded. During the word learning task, children read grouped sentences that introduced a novel word and were asked to identify the meaning of the new word. The behavioral analysis found that bilinguals performed comparably to monolinguals t(19)=-1.10, p=.29, suggesting that any differences in neural mechanisms or ERPs cannot be explained by differences in behavioral outcomes.. The EEG analysis focused on the N400 component, which is sensitive to word learning in adolescents [3]. When collapsed across groups, the N400 amplitude attenuated during word learning, F(2,48)=13.04, p<.001. A group comparison identified that the overall N400 amplitude was larger for bilinguals than for monolinguals, F(1,48)=7.63, p=.008. These findings suggest word learning in bilingual children is more effortful than in monolingual children. Taken together, these results show that different language experience results in differential engagement of neural mechanisms during vocabulary acquisition in school-aged children.
16:50-17:10		Gabriel Ong (University of Melbourne), Meredith McKague (University of Melbourne), Brendan Weekes (University of Melbourne) and David Sewell (University of Queensland)	Diffusing the Bilingual Lexicon	Bilingualism has been shown to facilitate word learning in adults [1, 2]. However, whether this same word learning difference is present in school-aged bilingual children is not certain. In the present study, we used behavioral and electroencephalography (EEG) methods to investigate whether language experience (i.e., maintaining one language versus two languages) is associated with different neural mechanisms during word learning in monolingual and bilingual school-aged children. For this study, 21 (10 bilingual, 11 monolingual) children, matched on age, socioeconomic status (SES), and language proficiency, completed standardized language and cognitive assessments and a word learning task during which their EEG was recorded. During the word learning task, children read grouped sentences that introduced a novel word and were asked to identify the meaning of the new word. The behavioral analysis found that bilinguals performed comparably to monolinguals t(19)=-1.10, p=.29, suggesting that any differences in neural mechanisms or ERPs cannot be explained by differences in behavioral outcomes.. The EEG analysis focused on the N400 component, which is sensitive to word learning in adolescents [3]. When collapsed across groups, the N400 amplitude attenuated during word learning, F(2,48)=13.04, p<.001. A group comparison identified that the overall N400 amplitude was larger for bilinguals than for monolinguals, F(1,48)=7.63, p=.008. These findings suggest word learning in bilingual children is more effortful than in monolingual children. Taken together, these results show that different language experience results in differential engagement of neural mechanisms during vocabulary acquisition in school-aged children.
17:10-17:30		COFFEE BREAK		

| 17:30-18:30 | Invited talk 4 | Robert Hartsuiker (Ghent University) | Development of shared syntax: results from artificial language learning | When bilinguals process a sentence in one language, they tend to reuse the same sentence structure when producing another sentence in their other language. Such cross-linguistic structural priming is larger in more proficient bilinguals (Bernolet et al., 2013), suggesting a developmental trajectory from specific syntactic representations for each language to more abstract representations that are shared across languages (Hartsuiker & Bernolet, 2017). We report a series of studies that tested this account. In these experiments, participants learn an artificial language (AL) in the lab, allowing us to exert full control over the characteristics of that language, the participants' prior knowledge of the language, and the characteristics of the learning situation. A first study, using an AL with similar syntax to Dutch, demonstrated that participants can quickly learn to formulate and comprehend a number of sentences in the artificial language (i.e., within one testing session), and that they show structural priming within the artificial language and between a natural language (Dutch) and the artificial language from the first day of testing onwards. Cross-linguistic structural priming emerged earlier for transitives than for ditransitives. Study 2 varied AL syntax: one version resembled Dutch (SVO order in the main clause, no case marking), one version had a different word order (SOV), and one had case marking. There was cross-linguistic priming between Dutch and each AL, suggesting that syntactic sharing involves representations that are abstract across important variations in form. Study 3, currently in progress, tests whether the presence of AL syntactic alternatives that are more (SVO) and less (SOV) similar to Dutch, prevents syntactic sharing (and hence cross-linguistic priming) between the less similar structure and Dutch. I will discuss the implications of these findings for our developmental account and if time permits sketch a new research line that investigates second-language syntactic development under ecological valid circumstances (i.e., in recently arrived immigrants). |