Interdisciplinary Perspectives on Code-Switching

3rd-4th October 2016
University of Cambridge

UNIVERSITY OF CAMBRIDGE

CAMBRIDGE LANGUAGE SCIENCES

Introduction

Research on code-switching was the province of specialists in linguistics alone in the latter part of the twentieth century, and is still a valuable source of insights into the human language faculty. However, it has relatively recently attracted the attention of researchers in psycholinguistics and neuroscience because of its promise to throw light not only on how the brain manages two or more potentially competing languages, but also on how the brain itself may adapt to the demands of this process.

The goal of this workshop will be to introduce researchers to this rapidly developing field and to allow those at the cutting edge to present their findings. In addition to state-of-the-art talks by the three main speakers, the workshop will feature both experimental and theoretical papers from perspectives related to the fields of linguistics, psychology and neurosciences.

Schedule

Monday 3rd October

10:30-11:00 Registration and refreshments

11:00-11:10 Welcome (Esther-Miriam Wagner, University of Cambridge)

11:10-11:55 **Keynote presentation 1:** ***Code-switching in linguistics, the state of the art***
Margaret Deuchar, University of Cambridge

11:55-12:05 Discussant 1: Henriëtte Hendriks, University of Cambridge

12:05-12:15 Discussant 2: Geoffrey Khan, University of Cambridge

12:15-12:45 General discussion

12:45-13:45 Lunch

13:45-14:05 ***Bilingual children's code-switching as a mark of linguistic competency***
W. Quin Yow[1] and Suzanne Flynn[2], Singapore University of Technology and Design[1], Massachusetts Institute of Technology[2]

14:05-14:15 Discussion

14:15-14:35 ***Language interaction in emergent grammars: Evidence from children's code-switching in Estonian and English***
Virve Vihman, University of Manchester/University of Tartu

14:35-14:45 Discussion

14:45-15:05 ***Analysing the effect of code-switching attitudes on acceptability judgment tasks***
Lucia Badiola, Rodrigo Delgado, Ariane Sande and Sara Stefanich, University of Illinois

15:05-15:15 Discussion

15:15-15:45 Tea and coffee

15:45-16:05 ***Code-switching in Arabic diglossia: A cognitive study***
Moh'd Al-Omari, University of Manitoba

16:05-16:15 Discussion

16:15-17:00 **Keynote presentation 2:** ***Language control and code-switching***
David Green, University College London

17:00-17:10 Discussant 1: Matt Davis, University of Cambridge

17:10-17:20 Discussant 2: John Williams, University of Cambridge

17:20-17:45 General discussion

17:50-18:45 Drinks and round table discussion

19:30 Dinner at the Maypole

9:00-9:20 *The effects of alternational code-switching on executive functions*
Julia Hofweber, Theodoros Marinis and Jeanine Treffers-Daller, University of Reading

9:20-9:30 Discussion

9:30-9:50 *Word frequency predicts asymmetry of lexical access*
Anna Ibrahim[1], Rosemary Varley[1] and Patricia Cowell[2], University of Sheffield[1]/University College London[2]

9:50-10:00 Discussion

10:00-10:20 *Mixing things up: How blocking and mixing affect the comprehension of code-switched sentences*
Michael Johns[1], Jorge Valdés Kroff[2] and Giuli Dussias[1], Pennsylvania State University[1]/University of Florida[2]

10:20-10:30 Discussion

10:30-11:00 Tea and coffee

11:00-11:20 Patterns of short-term phonetic interlingual interference in bilingual productions
Šárka Šimáčková and Václav Jonáš Podlipský, Palacký University, Olomouc

11:20-11:30 Discussion

11:30-11:50 *Accented speech attenuates code-switching costs: an electrophysiological study*
Carla Fernández and Janet van Hell, Pennsylvania State University

11:50-12:00 Discussion

12:00-12:20 *Not all code-switches are costly: Examining semantic vs. language unexpectancy*
Patricia Roman[1], Jorge Valdés Kroff[2] & Paola Dussias[1], Pennsylvania State University[1]/University of Florida[2]

12:20-12:30 Discussion

12:30-13:30 Lunch

13:30-14:15 **Keynote presentation 3 :** *Comparing competing accounts of code switching using predictive neurolinguistics*
Guillaume Thierry, Bangor University

14:15-14:25 Discussant 1: Ianthi Tsimpli, University of Cambridge

14:25-14:35 Discussant 2: Maria del Carmen Parafita Couto, Leiden University

14:35-15:00 General discussion

15:00-15:30 Tea and coffee

**15:30-16:45** Round table discussion and closing remarks

Maps and information

- **If you have an urgent problem** please contact Margaret Deuchar on +44 7947805380 **or in case of emergency dial 999 for ambulance, fire and police services.**
- **Wifi:** you can use the ticket ID and password provided to access the UniOfCam wifi. Eduroam is also available.

- **Workshop venue:**
  Rooms GR06/07
  Ground floor English Faculty Building
  Sidgwick Site
  University of Cambridge
  9 West Road
  Cambridge, CB3 9DP

- **Dinner venue:**
  The Maypole
  20a Portugal place
  Cambridge
  CB5 8AF
  +44(0)1223 352999

The Maypole, a pub where we will have our dinner buffet, is about a twenty minute walk (see below). Alternatively, you can call a taxi on +44 1223 715715 or take two buses from the University Library bus stop: (1) Uni 4 bus from West Rd. to Storey's Way and (2) Park & Ride or Bus no. 2 to Bridge Street.
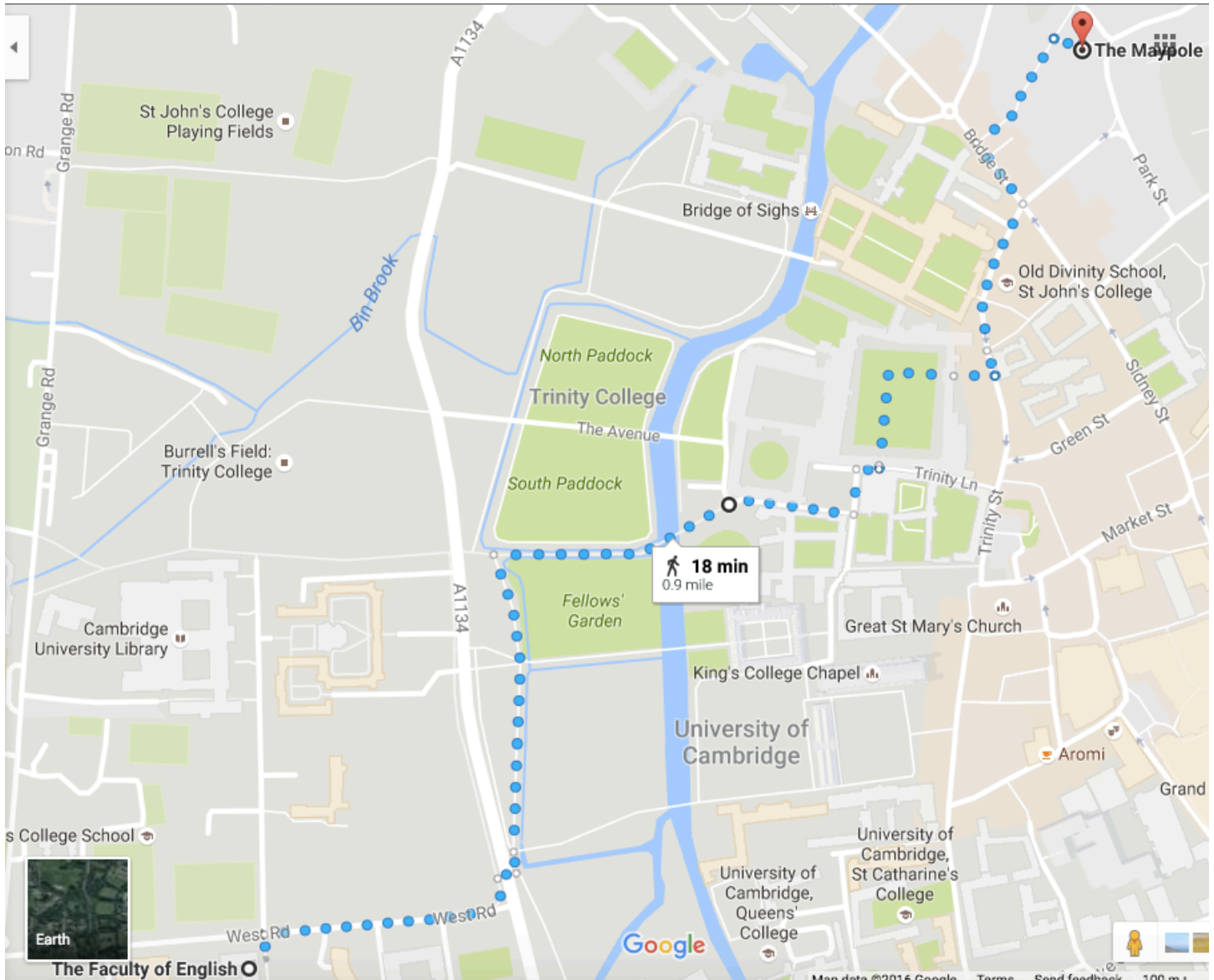
Keynote speakers

Margaret Deuchar

Margaret Deuchar is Emeritus Professor in Linguistics at Bangor University and Affiliated Lecturer at the Dept of Theoretical and Applied Linguistics, University of Cambridge. She is also affiliated with Cambridge Language Sciences (see https://www.languagesciences.cam.ac.uk/directory/professor-margaret-deuchar/) and is a member of their Steering Committee. She has previously held posts at Lancaster, Sussex and Cambridge Universities. She graduated from Cambridge in Modern Languages (French and German) and obtained her PhD from Stanford University. Her thesis was on British Sign Language and was followed by a 1984 book, *British Sign Language*, published by Routledge. Shortly afterwards she began research on bilingual acquisition and published (with S. Quay) a book entitled *Bilingual Acquisition: Theoretical Implications of a Case Study* in 2000 with Oxford University Press. She then extended her interests to bilingual adults, initially in the context of Wales, and was founding Director of the ESRC Centre for Research on Bilingualism in Theory and Practice (2007-2012). With the corpus-based group at the Centre she collected three corpora of code-switching data (Welsh-English, Welsh-Spanish and Spanish-English) which are available at www.bangortalk.org. She is currently working on a co-authored book to be published by John Benjamins and entitled *Building and Using the Siarad Corpus: Bilingual Conversations in Welsh and English.*

David Green

David W Green is an Emeritus Professor in the Faculty of Brain Sciences at University College London. He has research experience within the broad field of mental representations and language covering experimental and theoretical work on mental models - their construction and mental simulation - and argumentation. His specific focus for a number of years is the cognitive and neural bases of language control in normal bilingual and multilingual speakers and this focus led him to be one of the editors of *Bilingualism: Language & Cognition*. Theoretical work and neuroimaging research with neurologically normal participants has been combined with applied research into the neural predictors of speech recovery post-stroke in monolingual and multilingual individuals with aphasia.

Guillaume Thierry

Using experimental psychology and electroencephalography, Guillaume Thierry studies language comprehension in the auditory and visual modalities, and mainly the processing of meaning by the human brain, i.e., semantic access. Since he started his career at Bangor University in 2000, Professor Thierry has investigated a range of themes, such as verbal/non-verbal dissociations, visual object recognition, colour perception, functional cerebral asymmetry, language-emotion interactions, language development, developmental dyslexia, and bilingualism. Since 2005, Prof. Thierry has received funding from the BBSRC, the ESRC, the AHRC, the European Research Council, and the British Academy to investigate the integration of meaning in infants and adults at lexical, syntactic, and conceptual levels, using behavioural measurements, event-related brain potentials eye-tracking and functional neuroimaging, looking at differences between sensory modalities, different languages in bilinguals, and coding system (verbal / nonverbal). Prof. Thierry's core research question is how the human brain crystallises knowledge and builds up a meaningful representation of the world around it. He now focuses on linguistic relativity and the philosophical question of mental freedom.

Abstracts

Keynote 1: Code-switching in linguistics: the state of the art
Margaret Deuchar (University of Cambridge)

Research on code-switching in linguistics has involved a long controversy about the exact nature of the phenomenon and how it differs from the borrowing of words like *restaurant* in English which for most native speakers is no longer associated with its French source. Opposing positions differ on the criteria used to distinguish between switches and borrowings, some linguists using measures of linguistic integration and others of frequency. I will propose a solution using both measures, to be illustrated with Welsh-English data.

Another salient theme in linguistic research on code-switching is the issue of what regularities govern bilingual speakers' use of two languages in the same conversation. In other words, what is grammaticality in code-switching? Competing accounts offer contrasting predictions which have recently been subjected to empirical tests. These are particularly revealing at 'conflict sites', where the grammars of the two languages used by a bilingual contrast. I will provide evidence that an asymmetrical relation between the two languages used in bilingual communities allows the resolution of potential conflict between the grammars of the two languages and brings us closer to identifying grammaticality in code-switching.

Nevertheless, variable patterns of code-switching occur just as in monolingual speech, and a third focus is to identify the influential factors. I shall suggest that these may be community-specific, speaker-specific and conversation-specific, and I will illustrate these influences with reference to Welsh-English and Spanish-English data available on www.bangortalk.org.uk.

Recent analyses of corpus-based indices of conversational turns in bilingual speakers predict the occurrence of intra-sentential code-switches. We can infer that both languages are active in such cases. However, most utterances in these corpora contain no code-switches. Yet even when the output is in a single language there are grounds for thinking that both languages are in fact active. It follows that we need a model of code-switching, consistent with the joint activation of both languages, which permits the range of language use in bilingual speakers.

We treat overt speech as the outcome of a number of competitive processes governed by a set of control processes. For example, in a conversation, the speech of the other person may "trigger" code-switches consistent with bottom-up control. By contrast, the intentions of the speaker may act top-down to set the constraints on language use. I will discuss a model of language control that recruits both sources of control. In a nutshell, control processes external to the language network help construct an incremental speech plan. A speech plan is a parallel representation of the intended output and needs to be serialised to permit speech output. On this proposal, different uses of language are associated with distinct attentional states and so a change in language use is a change in attentional state. I will consider the nature of these states and their transitions.

Keynote 3: Comparing competing accounts of code-switching using predictive neurolinguistics
Guillaume Thierry (Bangor University)

Two prevailing theoretical accounts of code-switching (CS) have emerged from theoretical and corpus linguistics in relation to what happens at 'conflict sites' consisting of mixed language constructions where the language sources have different word orders. This is the case in Adjective + Noun constructions in Welsh and English. Whilst the adjective is prenominal in English (e.g., red book) it is post-nominal in Welsh (*llyfr coch* – literally 'book red'). A minimalist program (MP) account proposed by Cantone & MacSwan (2009) predicts that an adjective's position in a mixed construction is constrained by the language in which it is produced, irrespective of the morphosyntactic frame or matrix language of the sentence. On the other hand the Matrix Language Frame account (MLF) by Myers-Scotton (2002) predicts that adjective position will be constrained by the word order of the matrix language, irrespective of the language in which the adjective is produced. Thus, the MP account would regard an English adjective before a noun within a Welsh morphosyntactic frame as grammatical, but a Welsh adjective in the same position within an English morphosyntactic frame as a violation. Critically, MLF predictions are the opposite. We will record event-related potentials (ERPs) in highly fluent Welsh-English bilinguals as they read sentences presented word-by-word in the centre of a screen. The experimental design features six conditions: Two monolingual baselines and four test conditions in which the direction of the code-switch, the language of the critical adjective, and its position relative to the noun are (i) compatible with predictions of both MP and MLF, (ii) compatible with MP but not MLF, (iii) compatible with MLF but not MP, and (iv) compatible with neither. We anticipate stimuli in a suboptimal position to elicit a left anterior negativity (LAN), a modulation of ERPs particularly sensitive word order violations.

Code-switching in Arabic diglossia: A cognitive study
Moh'd Al-Omari (University of Manitoba)

This paper asked whether the language-processing bias that occurs in classical bilingualism can also take place in the situation of Arabic diglossia, where speakers use two co-existing varieties of the same language rather than prototypical independent languages. Speakers of Arabic use Colloquial Arabic (CA) and Modern Standard Arabic (MSA) in different contexts of their daily life with some overlapping (i.e., code-switching). To test the research hypotheses, a group of 40 literate native sparkers of Jordanian Arabic performed a lexical-decision task. The participants listened to an equal number of CA and MSA carrier sentences. The carrier sentences ended with a target word of either the same or the other variety of Arabic. Statistical analysis revealed that participants significantly delayed their responses to the target words in the language switching condition relative to the same target words in the non-switching condition. This finding is consistent with the BIMOLA model of word recognition (Grosjean, 1997; 2008). It shows that diglossic speakers do not activate the two varieties of their language at the same level when they are in a monolingual language mode. Moreover, the participants reacted significantly faster to MSA target words relative to CA target words. This finding does not support the hypothesis that MSA is a second language for literate native speakers of Arabic (Ibrahim, 2009).

Grosjean, F. (1997). Processing mixed language: Issues, findings, and models. In A. M. B. de Groot, & J. F. Kroll (Eds.), *Tutorials in bilingualism: Psycholinguistic perspectives* (pp. 225-254). Mahwah, NJ: Lawrence Erlbaum Associates.

Grosjean, F. (2008). *Studying Bilinguals*. Oxford: Oxford University Press.

Ibrahim, R. (2009). The cognitive basis of diglossia in Arabic: Evidence from a repetition priming study within and between languages. *Psychology Research and Behavior Management, 2*, 93-105.

Analysing the effect of code-switching attitudes on acceptability judgment tasks

Lucia Badiola, Rodrigo Delgado, Ariane Sande & Sara Stefanich
(University of Illinois)

The use of code-switching (CS) as a tool for linguistic inquiry poses many empirical challenges since there is no established methodology that unifies the field (González-Vilbazo et al. 2013). This lack of agreement affects numerous experimental elements. We focus on one specific aspect in the participant selection process: attitudes towards CS. This study examines the effects of CS attitudes on Acceptability Judgment Tasks (AJTs) among early Spanish/English bilinguals in the US. The attitudes that bilingual speakers have towards CS could interfere in the ratings that they provide in AJTs. Thus, we explore whether negative/positive attitudes towards CS correlate with degraded/higher ratings. 57 Spanish/English bilinguals completed a survey consisting of three blocks: a background questionnaire, an AJT of code-switched sentences, and a questionnaire about their CS attitudes. The CS data, taken from Koronkiewicz (2014) and Sande (2015), consisted of four conditions.

Table 1. CS Conditions

	CONDITION 1	CONDITION 2
Pro-drop stimuli (Sande 2015)	**Overtly realized subject** *No sé por qué* Lucía ate all those brownies. 'I don't know why Lucía ate all those brownies.'	**Covertly realized subject** *Me pregunto qué* discovered in his sister's diary. 'I wonder what *pro* discovered in his sister's diary.'
	CONDITION 3	CONDITION 4
Pronoun stimuli (Koronkiewicz 2014)	**Strong Pronoun/Full DP** The other day those girls *conocieron a nuestra abuela*. 'The other day those girls met our grandmother.'	**Weak pronoun** They *compraron unas manzanas*.' 'They bought some apples.'

Four Linear Regression Tests showed a significant relationship between attitudes and the ratings of code-switched sentences in Conditions 1 and 3; more positive attitudes predict higher acceptance ratings. There was no significant relation in Conditions 2 and 4: all participants rejected these sentences. In sum, our study attempts to contribute to the creation of standards and guidelines to be followed in experimental syntax that employs CS as a tool by suggesting that the variable under scrutiny (CS attitudes) should be controlled for.

González-Vilbazo, K., Bartlett, L., Downey, S., Ebert, S., Heil, J., Hoot, B., & Ramos, S. (2013). Methodological considerations in code-switching research. *Studies in Hispanic and Lusophone Linguistics*, 6(1), 119-138.

Koronkiewicz, B. (2014). Pronoun Categorization: Evidence from Spanish/English Code-Switching (Doctoral dissertation, UIC).

Sande, A. (2015). "How to drop the pro: evidence from code-switching". Hispanic Linguistics Symposium (HLS), UIUC, September 25th 2015.

Accented speech attenuates code-switching costs: an electrophysiological study
Carla Fernández & Janet van Hell (Pennsylvania State University)

Recently there has been growing interest in the neurocognitive mechanisms that drive the comprehension of code-switched sentences. Studies that used the Event-Related Potentials (ERP) technique have typically found that comprehending code-switched sentences entails a cost in terms of lexical-semantic-integration (as represented by the N400 effect) or sentence level-reanalysis (as represented by the LPC). Although code-switching occurs more frequently in spoken than in written communication, these neurocognitive studies have presented sentences visually. In two ERP studies, we investigated the auditory processing of code-switched sentences. In Experiment 1, highly-proficient Spanish-English bilinguals who identified as Hispanics listened to code-switched sentences (switching from Spanish to English and vice-versa) or non-switched sentences, produced by non-accented speakers. We observed an N400 when switching from English to Spanish, indicating that switching in this direction incurs a cost in lexical-semantic integration. We observed an LPC when switching from Spanish to English, indicating that switching in this direction impacts sentence level re-analysis. In Experiment 2, we examined the effects of accented speech on switching costs. Spanish-English bilinguals listened to similar sentences as in Experiment 1, this time produced by Spanish-accented speakers and non-accented speakers. We hypothesized that Spanish-accented speech would serve to alleviate processing costs in the English to Spanish switching direction, as the Spanish-accented English in the first part of the sentence would facilitate the comprehension of the upcoming switch into Spanish. As in Experiment 1, switching from English to Spanish yielded an N400 effect in the non-accented condition, and an LPC when switching from Spanish to English. Importantly, we observed an attenuation of the N400 effect when switching from English to Spanish in the Spanish-accented condition relative to the non-accented condition. Accented speech can thus facilitate the comprehension of upcoming code-switches into the language compatible with the accent, and serve as a cue to modulate code-switching costs.

The effects of alternational code-switching on executive functions
Julia Hofweber, Theodoros Marinis & Jeanine Treffers-Daller (University of Reading)

Bilingualism is found to affect executive functions, but the origins of this modulation are unclear. This study investigates the differential impact of code-switching types on *inhibition* of task schemata and on *conflict-monitoring* of co-activated task-schemata. The following code-switching types have been described (Muysken, 2000) and are listed in order of decreasing inhibitory involvement and increasing conflict-monitoring involvement (Treffers-Daller, 2009; Green & Wei, 2014): (1) *alternation* of structurally independent stretches from both languages, (2) *insertion* of lexical items from one language into the grammar of the other, (3) *dense code-switching* mixing co-activated lexicon and grammar. During alternation languages are kept mostly separate, so alternation is predicted to enhance inhibition most, but conflict-monitoring of co-activated schemata least. To test this prediction, 44 German-English bilinguals immersed in an L2-English-speaking context were administered a flanker task designed to assess inhibition and conflict-monitoring. The task contained a low-monitoring condition requiring little congruent-incongruent trial-switching (92% congruent-8% incongruent) and a high-monitoring condition (50% congruent-50% incongruent) requiring constant switching thus challenging conflict-monitoring (Costa et al., 2009). Participants' code-switching habits were assessed in questionnaires and frequency judgment tasks. A stepwise regression identified alternational code-switching as the best predictor of inhibitory performance in the low-monitoring condition challenging inhibition most $(F(2,42)=7.6, r=+0.4, p=0.007)$. Conflict-monitoring performance correlated negatively with alternational code-switching. In line with existing models, alternation therefore correlates positively with inhibitory performance, but negatively with the ability to manage co-activated task-schemata.

Costa, A., Hernandez, M., Sebastian-Galles, N. (2009). On the bilingual advantage in conflict processing: Now you see it, now you don't. *Cognition*, 113, 135-149

Green, D.W., Wei, L. (2014). A control process model of CS. *Language, Cognition and Neuroscience*, 24 (9), 499 – 511

Muysken, P. (2000). *Bilingual Speech: A Typology of Code-mixing*. Cambridge: Cambridge University Press, Cambridge, 2000

Treffers-Daller, J. (2009). CS and transfer: an exploration of similarities and differences. In: Bullock, B.E. and Almeida, J.T., eds. (2009) *The Cambridge Handbook of Linguistic Codeswitching*. Cambridge University Press, p.58-74

Word frequency predicts asymmetry of lexical access

Anna Ibrahim & Patricia Cowell (University of Sheffield)
Rosemary Varley (University College London)

Bilingual studies show that access to L2 words is slower than that to L1 words across several testing paradigms (code-switching (Aparicio & Lavaur, 2014), naming, translation (Kroll & Stewart, 1994)). Access to L2 words is also reported to be sensitive to semantic blocking (Kroll & Stewart, 1994). These observations conform to predictions of influential models of bilingual processing which propose autonomous lexicons with different processing routes. We explored an alternative hypothesis that such access asymmetries are due to imbalance in frequency of use between L1 and L2 words often present in consecutive bilinguals. Using a within-language 'translation' task, involving high/low frequency (HF/LF) synonyms, we obtained parallel results to bilingual studies. Experiment 1 with 32 monolingual participants revealed that HF synonyms were accessed faster than their LF twins. Experiment 2 with 59 participants showed that semantic blocking slowed retrieval of LF synonyms, but not HF ones. Experiment 3 with 40 English-Russian bilinguals examined translation speed and sensitivity to blocking in two groups of Russian-English bilinguals who differed in frequency of use of their languages. We observed that asymmetries in lexical access were modulated by frequency of use. The results indicate that bilingual processing is underpinned by an integrated lexicon, where a HF word is accessed faster than its LF twin within- or across- languages. The findings provide an explanation of phenomena such as code-switching in real time language production. There is competition between words or even whole constructions, and those of higher frequency are retrieved irrespective of their source language.

Aparicio, X., & Lavaur, J.M. (2014). Recognising words in three languages: effects of language dominance and language switching. *International Journal of Multilingualism*, 11(2), 164-181.

Kroll, J., & Stewart, E. (1994). Category interference in translation and picture naming: evidence for asymmetric connections between bilingual memory representations. *Journal of memory and language*, *33(2),* 149-174.

Mixing things up: How blocking and mixing affect the comprehension of code-switched sentences

Michael Johns & Giuli Dussias (State University of Pennsylvania)
Jorge Valdés Kroff (University of Florida)

Given the link between language usage and language structure (Bybee & Beckner, 2010), one goal of lab-based approaches should be to draw on corpus-based studies to answer questions concerning the production and processing of language. In the psycholinguistic study of codeswitching, this is particularly lacking: many studies do not take into account the social contexts in which code-switching occurs. Therefore, the presentation of stimuli in lab-based studies often does not align with how code-switches are encountered in naturalistic bilingual discourse. For example, while bilingual corpora show that code-switches occur in a "blocked" fashion (i.e., code-switches are localized and surrounded by longer unilingual stretches of speech) (Tamargo *et al.*, 2016), many lab studies present code-switched stimuli in what has been called a "mixed" block, where switches between unilingual and code-switched sentences occur at every turn. Here we examine how the method of presentation—mixed vs. blocked—affects the comprehension of code-switches, with the goal of determining which method more adequately reflects bilinguals' experiences.

In a within-subject design, we recorded eye-movements while habitual Spanish-English code-switchers read sentences containing determiner-noun switches (*La mujer planchó el **suit** para su hijo*) and unilingual Spanish sentence (*El jóven exploró la **casa** con sus amigos)* in two sessions: in the blocked session, participants read a block of unilingual Spanish sentences followed by a block of code-switched sentences in a counterbalanced fashion; in the mixed session, unilingual Spanish sentences were interleaved with code-switched sentences. A mixed-effects model will compare reading times when the target nouns were read in a mixed block vis-à-vis a blocked presentation. We predict that determiner-noun switches will be harder to process in the mixed block, as this type of mixing is not prevalent in bilingual discourse. The results of this study will help determine which mode of presentation more closely aligns with the sociolinguistically-driven

Bybee, J. & Beckner, C. (2010). Usage-based theory. *The Oxford Handbook of Linguistic Analysis*, 827-855.
Tamargo, R. E. G., Kroff, J. R. V. & Dussias, P. E. (2016). Examining the relationship between comprehension and production processes in code-switched language. *Journal of Memory and Language.*

Not all code-switches are costly: Examining semantic vs. language unexpectancy

Patricia Roman & Paola Dussias (Pennsylvania State University)
Valdés Kroff Jorge (University of Florida)

Psycholinguistic research reveals processing costs when bilinguals are cued to switch languages in production (Meuter & Allport, 1999). However, some bilinguals engage in *code-switching*. Its ubiquity suggests that under some circumstances, switching does not incur a processing cost but may be processed as an unexpected event (Moreno et al., 2002). In parallel, prior unilingual research indicates that semantic violations or unexpected continuations not supported by sentential context also result in processing costs, as indicated by increased reading times or the presence of the N400 with event-related potentials (ERPs; Federmeier et al., 2002).

To investigate the relative costs of semantic unexpectancy and code-switches in comprehension, we conducted an ERP study with 22 Spanish-English bilinguals. Participants read high-semantic constraint Spanish sentences in which semantic expectancy (high v. low) and language context (code-switch v. non-switch) of critical words were manipulated:

1) *Los jovenes se reunieron para ver el partido de baloncesto y apoyar al _____*
   "The guys got together to watch a basketball game and to support the _____"
a) *equipo* (high, non-switch)
b) *entrenador* (low, non-switch)
c) *team* (high, code-switch)
d) *coach* (low, code-switch)

We compared neural activity at 250-350ms 350-450ms and 500-700ms post critical word. As expected, we observed a negative deflection at around 400ms (N400) for low- compared to high-expectancy sentences. However, code-switches elicited a Late Positive Complex (LPC, 500-700ms), indicating that code-switches do not result in increased difficulty in semantic integration *per se*. Moreover, this effect arouse only in high but not in low-expected endings, supporting previous eye-tracking data (Altarriba et al.,1996). Our results demonstrate that code-switches may cause a reduced cost in sentence comprehension compared to same language semantic unexpectancy, but this reduced cost is modulated by semantic fit.

Patterns of short-term phonetic interlingual interference in bilingual productions

Šárka Šimáčková &Václav Jonáš Podlipský
(Palacký University Olomouc)

Contrary to early findings [1] suggesting that code-switching involves a complete phonetic switch, the past decade saw studies (see [2]) reporting phonetic interaction of a bilingual's languages. However, their results differ in direction and magnitude of the L1-L2 influence, possibly due to differences in bilinguals' language background (age and chronology of language acquisition, language dominance) or in research design. We report a replication of our earlier VOT study [3] examining carry-over L1-to-L2 interference in bilingual productions by 18 late L1-Czech-dominant L2-English bilinguals (trainee interpreters). In that study, they produced English sentences under three conditions: L2-only, code-switching into L2, and code-switching plus interpreting into L2. Short-term increases of L1-interference in L2 were observed: VOTs of /p/ and /t/ were shorter, more L1-like, in the bilingual tasks than in L2-only. VOTs in Code-switching vs. Code-switching-plus-interpreting did not differ. The current study, involving 14 bilinguals matched for language background with the previous participants, removed the code-switch from the interpreting condition, asking whether the short-term L1-interference would occur due to L1 activation during speech planning even without the recent articulation of L1 sounds. An RM ANOVA found an interaction between the factors Study (Original/Replication) and Condition. The VOTs of the two participant groups were comparable in L2-only (as expected), but the new group produced longer VOTs during interpreting than the old group. However, we cannot conclude that L1-interference was reduced in the absence of code-switching. This is because such difference occurred even in the code-switching condition. In fact, unlike in the original study, the VOTs in both the bilingual tasks tended to be longer than in L2-only. Thus, individual switching strategies, in addition to language-background differences, probably contribute to discrepancies between studies.

[1] Grosjean & Miller (1994). *Psychol Sci*, *5*(4), 201-206.
[2] Piccinini & Arvaniti (2015). *J Phonetics*, *52*, 121-137.
[3] anonymous

Language interaction in emergent grammars: Evidence from children's code-switching in Estonian and English

Virve Vihman (University of Manchester/University of Tartu)

This paper examines developmental code-switching (CS) data from bilingual children to explore two questions: is there evidence for online construction of complex morphology in early acquisition; and do children adhere to the constraints posited for adult CS (e.g. Myers-Scotton & Jake 2000), more recently questioned even for adult models (e.g. Demirçay & Backus 2014)? As the process underlying production is opaque, codeswitching data can cast light on the way word forms are retrieved or constructed and combined. Bilingual children's mixed utterances are a rich source of data on the emerging linguistic system. The data consist of over 600 diary entries from two children bilingual in Estonian and English (ages 2;10–4;7 and 6;6–8;3). The languages differ typologically, in syntax and the complexity of their morphological systems. Examples discussed here involve CS at morpheme boundaries and double marking, in nominal (ex. 1) and verbal (2) morphology, as well as switching within forms which are said to be holistically stored, such as participles (3). Verbal morphology in a subset of the data blends resources from both languages: it is unclear whether the -n marker in (2) is a 1sg Estonian inflection or an English progressive marker.

1. the sääse's (mosquito.GEN.EST - GEN.ENG) wings are one color (4;0.7) 'the mosquito's wings…'
2. I wasn't hitting you, I was koputa-n (knock-3SG.PRS) (3;5.24) '... I was knocking'
3. [the cat] ate a drumstick that was jät-en (leave-PASTPARTICIPLE.ENG) over (3;6.5)

The ways in which these young bilinguals blend structures in online code-switching, building on emergent knowledge of both languages, suggest mutual influence and deep interaction between the languages (Backus & Verschik 2012, De Bot 2004, Verschik, 2007).

Bilingual children's code-switching as a mark of linguistic competency

W. Quin Yow (Singapore University of Technology and Design)
Suzanne Flynn (Massachusetts Institute of Technology)

Early studies on code-switching postulated that bilingual children's code-switching behaviour reflects an inability to differentiate two language systems or a lack of linguistic competence (e.g., Lindholm & Padilla, 1978). Case studies, however, found that children's code-switching behavior shows mastery of the grammatical systems of both languages, rather than a lack of, and that their code-switched utterances are systematic and conform to the grammatical constraints of both languages (e.g., Paradis, Nicoladis, & Genesee, 2000). Despite earlier attempts to understand the impact of code-switching on children's language development, the relationship between children's code-switching and linguistic competency remains largely unknown. This study investigated the relationship between code-switching and linguistic competency in children in preschool settings. Measures of 55 English-Mandarin children's spontaneous speech were obtained through five 3-hour observation sessions in each of two childcare centres. The frequency of their code-switching utterances, number of different word roots and mean length utterance (MLU) in their daily conversations were analysed. Teachers' assessment of the children's language competency in English and Mandarin was collected approximately six months later in order to ascertain whether any predictive relationship exists between code-switching and linguistic competency. Results from correlational and hierarchical regression analyses revealed that children who code-switched more with peers demonstrated a greater level of expressive linguistic competency in one language, while showing no sign of a weaker level of competency in another, than children who code-switched less. Code-switching may be a mark of linguistic competency - children code-switch because they have the linguistic competency in both languages to do so.

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Organisers

Magdalen Connolly
Margaret Deuchar
Aretousa Giannakou
Draško Kašćelan
Isabelle Lorge
Mojgan Sarabi
Esther-Miriam Wagner

Cambridge Language Sciences Strategic Research Initiative

Department of Theoretical and Applied Linguistics
Faculty of Modern and Medieval Languages
University of Cambridge
Sidgwick Avenue
Cambridge, CB3 9DA