Technische
Universität
Braunschweig

2nd International Symposium on
Bilingual and L2 Processing
in **Adults** and **Children** (ISBPAC TU)
May 24 - 25, 2018

Book of Abstracts

Bye Hoşçakal Ćao Hello Merhaba Zdravo
Great Harika Odlično

Sorry Üzgünüm Izvini Go d Morning
Günaydin Dobro Jutro

DFG Deutsche
Forschungsgemeinschaft

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Programme at a Glance

Thursday 24th May

08.00 - 08.45	Registration (BI 85, foyer)
09.00 - 09.15	Conference opening (BI 84.1)
09.15 - 10.15	**Keynote 1**
10.15 - 10.45	Coffee break
10.45 - 12.15	**Talks 1: Morphology**
12.15 - 13.15	Lunch
13.15 - 14.15	**Talks 2: Neuroscience**
14.15 - 15.15	**Poster session 1** (Sports Hall)
15.15 - 15.30	Coffee break (Sports Hall)
15.30 - 16.30	**Poster session 2** (Sports Hall)
16.30 - 18.00	**Talks 3: Code-Switching**
19.00	Conference dinner

Friday 25th May

09.00 - 10.00	**Keynote 2**
10.00 - 10.30	Coffee break
10.30 - 12.00	**Talks 4: Morpho-Syntax & Artificial Languages**
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Welcome

Welcome to the 2nd International Symposium on Bilingual Processing in Adults and Children (ISBPAC-TU) in Braunschweig.

After the great success of the inaugural ISBPAC, organised by Maialen Iraola Azpiroz and Shanley Allen at the University of Kaiserslautern in 2016, the Linguistics section of the Department of English and American Studies at the TU Braunschweig is very pleased to host the second symposium on bilingual processing.
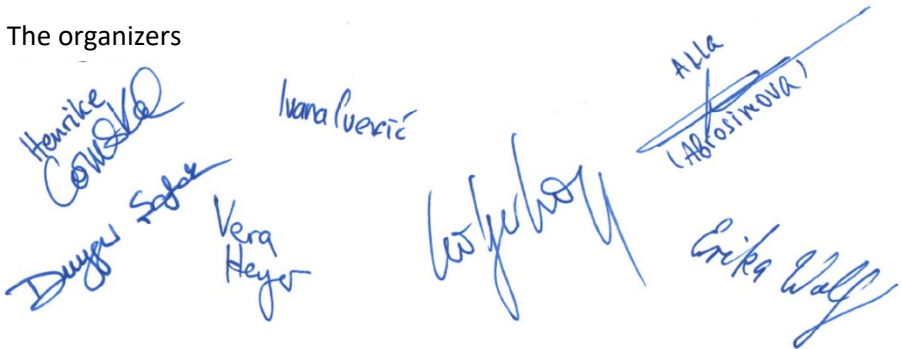
We received more than 110 abstracts from 30 countries. After each abstract was reviewed by three members of the scientific committee, we could accept sixteen abstracts for talks and 47 abstracts for poster presentation. In all, the acceptance rate was 56%. Not only do these numbers show that research on bilingual processing is thriving but they also demonstrate that a symposium like ISBPAC meets with great interest among the research community.

The papers and posters reflect a large diversity of topics, populations, language combinations and methods. We organized the talks into thematic sessions that showcase the diversity and the foci of current research on bilingual language processing. In addition, we are pleased to have three keynotes that provide complementary perspectives on bilingual processing. Vicky Chondrogianni (Edinburgh) will present her recent work on sentence comprehension among bilingual heritage children. Ian Cunnings (Reading) outlines relations between parsing and working memory in non-native sentence processing, building on his 2017 keynote paper in *Bilingualism: Language and Cognition*. Janet van Hell (Pennsylvania State) focusses on experimental approaches to code-switching in sentence contexts using behavioural and neurophysiological methods. In addition, the workshop on visual-world eye-tracking on the eve of the symposium taught by Theres Grüter (Hawai'i) introduced methodological advances in the study of bilingual processing in a hands-on manner. We are delighted by the high registration numbers and we hope you have a stimulating ISBPAC[TU] at the TU Braunschweig.

The TU Braunschweig is one of nineteen Institutes of Technology in Germany and a founding member of the TU9 – the group of Germany's leading Institutes of Technology. With 20,000 students at six faculties, the TU Braunschweig is a leading university in Lower Saxony, and it looks back on a long history starting with the foundation of the Collegium Carolinum in 1745. The TU has six campus sites, with Campus Nord being the main campus for the Faculty of the Humanities and Educational Sciences (Fak 6). ISBPAC[TU] coincides with the 50th anniversary of the Humanities and Educational Sciences at the TU, and ISBPAC[TU] contributes to making the research in our faculty visible.

We hope you enjoy the symposium and you get a chance to explore the city and sights of Braunschweig and the surroundings.

The organizers

Acknowledgements

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Henrike Comes-Koch
Ivana Cvekić
Claudia Flohr
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Vicky Chondrogianni *(University of Edinburgh)*
Ian Cunnings *(University of Reading)*
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Dieter Thoma *(University of Mannheim)*
Agnieszka Tytus *(University of Mannheim)*
Sharon Unsworth *(Radboud University, Nijmegen)*
Janet van Hell *(Pennsylvania State University)*

Useful Information

Conference Venue

ISBPAC^{TU} 2018 will take place at the Campus Nord of TU Braunschweig. The campus is located in Bienroder Weg 80-97, with the conference venue being in Bienroder Weg 83-85 (BI 83-85). For details, see maps in the back of the booklet.

Travel Information

To reach Campus Nord you can take tram No. 2 (Stop: *Siegfriedstraße*), or buses No. 416, 426, 436 (Stops: *Freyastraße*, *Siegfriedstraße*). The conference location is a five-minute walk from the stops. The only direct connection from the main station to Campus Nord is bus line 436.

For details on public transport, see:

http://www.verkehr-bs.de/fahrplan/fahrplanauskunft.html.

You can also call a taxi by dialling one of the following numbers:
+49-531-666666; +49-531-55555; +49-531-16811681

Registration

Conference registration will take place in the foyer of BI 85 on Thursday 24th May from 8 am. The registration desk will be staffed during the breaks to assist you with any queries you might have.

If you attend the pre-conference workshop on Wednesday 23rd May, you will also have the option of collecting your conference package on that day in front of room BI 80.1.

Oral Presentations

For oral presentations, a Windows laptop running Microsoft PowerPoint 2013 and OpenOffice 4.1.5 will be provided. There are HDMI, VGA and audio connections available for the projector.

Please make sure that your presentation is uploaded to the presentation computer well before your talk (in the break before your scheduled session at the latest). If you want to use your own computer, please make sure to bring a suitable adapter (e.g., mini-HDMI, Mac). There will be a technician available in the lecture hall to assist you.

Posters

There will be two poster sessions, which will be held in the Sports Hall (BI 83) on Thursday 24th May. Poster session 1 will take place from 14.15 - 15.15 hrs, followed by a 15-minute coffee break in the same room. Poster session 2 will take place from 15.30 - 16.30 hrs.

Pins will be available for hanging posters – do not use any other method of securing posters to boards. Please remove your poster during the lunch break on Friday at the latest. Presenters are expected to be present at their poster during the session.

Best Student Presentation Award

To support junior researchers in the field, there will be an award for the best talks and posters presented by (graduate) students. Students willing to participate will be asked to attach a specific badge to their posters or wear the badge for their talks. The badges will be handed out at the reception desk. All conference attendees will be asked to cast their vote, using the forms provided in the conference package.

Book Exhibit

There will be a book display by John Benjamins, Mouton de Gruyter and Multilingual Matters in the foyer of BI 85 next to the registration desk.

Internet Access

Wireless internet is available on campus. If your institution participates in the *eduroam* network, you can log in with your credentials. Alternatively, you can connect to the *tubs-guest* network with a personalised user name and password you will receive at registration.

Coffee and Lunch

Coffee and lunch will be served in the foyer of BI 84 (outside the lecture hall) as indicated in the programme. For the poster session, coffee will be served in the Sports Hall.

Lounge Room
Room BI 85.1 is available as lounge area during the entire conference.

Luggage Storage
If you have any luggage, you can store it in room BI 85.2.

Welcome Get-Together
There will be an informal get-together on the night before the conference. You are welcome to join us for a drink (or two) at the *Fuchs Blau* on Wednesday evening (23rd May) from 7 pm.

>   ***Address:*** Am Magnitor 1
>   (bus/tram stops: *Schloss* or *Am Magnitor*)

Conference Dinner
The conference dinner will be held in the restaurant *Al Duomo* on Thursday 24th May at 7 pm. Please wear your name tag for the dinner as this will serve as the ticket.

>   ***Address:*** Ruhfäutchenplatz 1 (opposite of Brunswick Cathedral; bus stop: *Rathaus* for bus 416 and tram line 2)

Restaurants
Here is a collection of restaurants at different price ranges (€ to €€€):

€
NEM Quan
Addr.: Schuhstraße 22
Vietnamese street food, fresh and fast, take away

Guidos Pizzeria
Addr.: Neue Straße 22
Fresh pizza, small and authentic Italian food

Yakamoz
Addr.: Kattreppeln 10
Turkish food, take away

€€ (advisable to book)
Troja
Addr.: Bültenweg 6
Phone: +49-531-332327
Turkish food, nice atmosphere

Schadt's Brauerei
Addr.: Höhe 28
Phone: +49-531-400349
Traditional brewery, local food

Badsha
Addr.: Ölschlägern 31
Phone: +49-531-2615987
Indian food, great service

€€€ (advisable to book)

Brodocz
Addr.: Stephanstraße 2
Phone: +49-531-42236
Slow food, organic, vegan

Tresor
Addr.: Bankplatz 8
Phone: +49-531-48274903
Elegant, great wine

La Vigna
Addr.: Ziegenmarkt 3
Phone: +49-531-125213
Italian tavern, slow food, great wines

Grocery Stores

Most grocery stores are open until at least 8 pm. Here are some grocery stores located in the town centre and close to the main campus and Campus Nord:

Rewe (town centre)
Schlossarkaden Basement
Addr.: Ritterbrunnen 1
Open: Mon -Sat 08.00-21.00

Rewe (main campus)
Addr.: Wendenring 1-4
Open: Mon - Fri 07.00-24.00,
Sat 07.00-23.30

Edeka (town centre)
Addr.: Bankplatz 1
Open: Mon - Thur 08.00-21.00,
Fri - Sat 08.00-22.00

Netto (Campus Nord)
Addr.: Bienroder Weg 78
Open: Mon - Sat 07.00-21.00

Note: Shops are closed on Sundays.

Emergencies

In cases of emergency, call 112.

For emergency medical service, go to:
Klinikum Braunschweig, Holwedestraße 16 (Phone: +49-531-5950)

For smaller health issues, you can get non-prescription drugs in pharmacies, e.g.:

Apotheke am Bienroder Weg
(Campus Nord)
Bienroder Weg 78/79
Mon - Fri 08.00-19.00,
Sat 09.00-16.00

Apotheke K10
(town centre)
Küchenstraße 10
Mon - Fri 07.30-22.30,
Sat + Sun 10.00-19.00

Social Activities in Braunschweig

Out into the green…

Braunschweig has many beautiful parks and lakes close to the city centre (the Oker with the theatre and museum parks, Inselwall, Bürgerpark, Botanical Garden) and in the surrounding areas (Richmond Park with Palace, Riddagshausen, Prinz-Albrecht-Park, Heidberg Lake, Südsee - The South Lake and Ölper Lake) that are worth a trip. You may rent a kayak to paddle on the Oker or go for a dip in Heidbergsee.

- Take a raft trip across the Oker to discover Braunschweig's especially beautiful side

- Learn about the city's history on a sightseeing tour

- Try some culinary delights in the eateries in the city centre

- Climb the 61m-high Town Hall Tower for a view of the city

- Appreciate the artwork at one of the 12 museums and over 25 galleries

- Explore Braunschweig's green oases by bike

- Enjoy a coffee or an ice cream at Kohlmarkt while watching the world go by

- Discover the pretty city centre on a shopping trip

- Round off the day with a visit to the State Theatre or one of the many smaller theatres

(Source: www.braunschweig.de/tourismus)

Pre-Conference Workshop

Eye Tracking in Linguistic Research

Theres Grüter (University of Hawai'i)

What can eye gaze tell us about language processing? In this workshop, we will critically examine the assumptions that underlie the use of eye-tracking in language research. We will focus specifically on the Visual World Paradigm (VWP), in which children and adults view visual arrays while listening to spoken language. A key advantage of this paradigm lies in its low task demands, making it particularly attractive for research with a wide variety of child and adult populations. We will discuss what kinds of questions about bilingual and L2 processing this paradigm can help us address, as well as what questions it is not suited to address. We will look at what it takes to conduct a VWP experiment, including the creation of visual and auditory materials, and touch on some of the issues that need to be considered in the analysis and interpretation of data from a VWP experiment.

Date: 23rd May 2018, 3 - 6 pm
Location: BI 80.1 (Bienroder Weg 80, ground floor)

Conference Programme

Thursday 24th May

08.00 - 08.45	Registration (BI 85, foyer)
09.00 - 09.15	Conference opening (BI 84.1)

09.15 - 10.15	**Keynote 1** *Chair: Holger Hopp* Sentence comprehension in heritage bilingual children *Vicky Chondrogianni*

10.15 - 10.45	Coffee break

	Talks 1: Morphology *Chair: Bilal Kırkıcı*
10.45 - 11.15	**T01** The time-course of verbal morphology anticipation: When interpreting experience makes a difference *Cristina Lozano-Argüelles, Nuria Sagarra & Joseph Casillas*
11.15 - 11.45	**T02** The nature of derivational priming in L2 learners: Surface form or lexical effects? *Vera Heyer*
11.45 - 12.15	**T03** Persistent differences between native speakers and late bilinguals: Evidence from inflectional and derivational processing in older speakers *Kirill Elin, Jana Reifegerste & Harald Clahsen*

12.15 - 13.15	Lunch

	Talks 2: Neuroscience *Chair: Edith Kaan*
13.15 - 13.45	**T04** (Re)exploring the effect of the bilingual experience on brain structure *Vincent Deluca, Christos Pliatsikas, Jason Rothman & Ellen Bialystok*
13.45 - 14.15	**T05** ERP evidence for attrition in L1 lexicon and morpho-syntax *Karsten Steinhauer & Kristina Kasparian*
14.15 - 15.15	**Poster session 1**
15.15 - 15.30	Coffee break
15.30 - 16.30	**Poster session 2**
	Talks 3: Code-Switching *Chair: Jorge Valdés Kroff*
16.30 - 17.00	**T06** When switching language is cost-free *Michela Mosca, Chaya Manawamma & Kees de Bot*
17.00 - 17.30	**T07** Code-switching from Dutch to Frisian requires more cognitive control than code-switching from Frisian to Dutch *Evelyn Bosma & Elma Blom*
17.30 - 18.00	**T08** Individual differences in bilingual grammars *Clara Cohen, Catherine Higham, Syed Waqar Nabi, Lara Schwarz, Mike Putnam, Gerrit Jan Kootstra & Janet van Hell*
19.00	Conference dinner

Friday 25th May

09.00 - 10.00	**Keynote 2** *Chair: Vera Heyer* Parsing and working memory in non-native sentence processing *Ian Cunnings*
10.00 - 10.30	Coffee break
	Talks 4: Morpho-Syntax & Artificial Languages *Chair: Marit Westergaard*
10.30 - 11.00	**T09** Language production practice improves comprehension performance on grammatical dependencies in early L2 learning *Elise Hopman & Maryellen MacDonald*
11.00 - 11.30	**T10** Reanalysis processes in non-native sentence comprehension *Hiroki Fujita & Ian Cunnings*
11.30 - 12.00	**T11** The use of case marking to predict an upcoming thematic role in L1 and L2 processing *Judith Schlenter & Claudia Felser*
12.00 - 13.00	Lunch
	Talks 5: Agreement *Chair: Sol Lago*
13.00 - 13.30	**T12** Gender attraction in native and heritage Greek *Anastasia Paspali*
13.30 - 14.00	**T13** Gender representation and processing in Russian-German bilinguals *Oleksandra Gubina & Johannes Gerwien*
14.00 - 14.30	**T14** How classifiers facilitate processing in L2 Chinese *Theres Grüter, Elaine Lau & Wenyi Ling*

14.30 - 15.00	Coffee break

	Talks 6: The Early Bilingual Lexicon *Chair: Sharon Unsworth*
15.00 - 15.30	**T15** Lexical access in auditory and visual word recognition: An eye tracking study with monolingual and bilingual children *Christina Schelletter*
15.30 - 16.00	**T16** Language detection in the early stages of the bilingual lexicon *Pauline Schröter & Sascha Schroeder*

16.15 - 17.15	**Keynote 3** *Chair: Henrike Comes-Koch* Code-switching in bilingual speakers: Behavioral and electrophysiological evidence *Janet van Hell*

17.15 - 17.30	Conference closing

Poster Sessions

Session 1

P01 Recent-event effects in bilingual language comprehension: Evidence from eye-tracking
Dato Abashidze, Kim McDonough, Pavel Trofimovich & Julien Mercier

P03 Consequences of bilingualism and L2 exposure type for the processing of filler-gap dependencies: Data from English-Afrikaans bilinguals
Robyn Berghoff

P05 Processing L2 intonation contours and exhaustivity: A mouse-tracking study
Rebecca Carroll & Sabine Zerbian

P07 L2 parafoveal processing (or lack thereof)
Leigh Fernandez & Shanley Allen

P09 Lingering misinterpretation of non-local dependencies in non-native comprehension
Hiroki Fujita & Ian Cunnings

P11 The effects of L1 re-immersion on Italian anaphora resolution in an L2 environment
Chiara Gargiulo & Joost van de Weijer

P13 A *boat* in a *boot*: Cognate effects during interlingual homograph translation
Randi Goertz, Ton Dijkstra & Alex Wahl

P15 The processing of English-Turkish (false) cognates: What is the role of morphology?
Bilal Kırkıcı, Ozan Can Çağlar & Esra Ataman

P17 How do native and non-native grammars affect multilingual pronoun comprehension?
Sol Lago, Anna Stutter Garcia & Claudia Felser

P19 Endpoint preferences in bilingual infants
Anna Marklová & Barbara Mertins

P21 Establishing antecedent reference for L2 reflexive pronouns among L1 Chinese learners of Japanese: An eye tracking study
John Matthews, Makiko Hirakawa, Kazue Takeda, Mari Umeda, Michiko Fukuda, Neal Snape & Kazunori Suzuki

Session 2

P18 An integrated encoding-decoding model of SLA
Anke Lenzing

P20 Multilingual learning in French immersion contexts: Age and socioeconomic factors
Alexandra Marquis & Phaedra Royle

P22 An ERP investigation of Spanish scalar implicatures: An L1 attrition study
David Miller & Jason Rothman

P24 Language processing and ambiguity resolution in monolingual and bidialectal ageing
Natalia Nannou & Georgia Fotiadou

P26 Anticipatory eye movements in L2 *wh*-movement
Angela Patarroyo, Leigh Fernandez & Shanley Allen

P28 The development of functional code switching in bilingual twins: A pragmatic approach
Caroline Pilger

P30 Using corpus methods to investigate parsing strategies: The position of antecedent strategy in late bilinguals (L1 English – L2 Spanish learners)
Teresa Quesada & Cristóbal Lozano

P32 Prosodic cues facilitate morphological anticipation in monolinguals and bilinguals
Nuria Sagarra & Joseph Casillas

P34 The (non)interaction of discourse and grammatical cues in L1 and L2 processing: The case of English singular *they*
Neil Shook, Laurel Brehm, Holger Hopp & Carrie Jackson

P36 Cross-language transfer in a bilingual school in Germany: The case of receptive grammar
Anja Steinlen & Thorsten Piske

P38 Attention benefits and burdens in natural bilingual reading
Dieter Thoma

P40 Code-switching patterns en un modelo computacional: Simulating code-switching in a bilingual sentence-production model
Chara Tsoukala, Stefan L. Frank, Mirjam Broersma & Antal van den Bosch

Note: The abstracts on the following pages are ordered by type:
   1. Keynotes
   2. Talks (T)
   3. Posters (P)

Some of the figures in the abstracts are very small. You can see the figures in more detail in the pdf version of this booklet, available for download on our website.

Keynote 1

Sentence comprehension in heritage bilingual children

Vicky Chondrogianni

University of Edinburgh

Heritage speakers are early bilinguals acquiring their first language under reduced input conditions and under pressure from the dominant societal language (Valdés, 2000; Scontras, Fuchs & Polinsky, 2015). Most studies to date have focused on the language abilities of adult heritage speakers and their performance on primarily behavioural measures in comparison to their monolingual peers (Montrul, 2015 for an overview). In the current talk, I will present how heritage children develop their heritage language abilities and the child-internal and external-factors that affect their language outcomes. More specifically, I will do so by investigating how heritage children and other groups of bilingual children use morphosyntactic cues to parse sentences online and offline in a series of behavioural and eye tracking studies.

Keynote 2

Parsing and working memory in non-native sentence processing

Ian Cunnings

University of Reading

The similarities and differences between native (L1) and non-native (L2) sentence processing have been widely debated (see Cunnings, 2017). One influential account claims L2 learners have difficulty using syntactic information during processing (Clahsen & Felser, 2006). Others argue L1 and L2 processing are fundamentally similar, with any differences resulting from L2 learners lacking processing 'capacity' or working memory resources (McDonald, 2006).

In this talk, I will overview recent research suggesting L2 learners can utilise syntactic information similarly to L1 speakers. I will also argue that capacity-based limitations do not explain the observed L1/L2 differences. Building on work within the cue-based parsing framework (Lewis et al., 2006; Van Dyke et al., 2014), I will argue L1/L2 differences are best explained in terms of how information is encoded and retrieved from memory during processing. In particular, I will argue that L2 learners weight memory retrieval cues differently to L1 speakers. More broadly, and in line with recent advances in L1 processing (Van Dyke et al., 2014), this account predicts difficulty observed in L2 comprehension is best explained in terms of the quality and content, rather than quantity, of information that needs to be encoded and retrieved from memory during processing.

Keynote 3

Code-switching in bilingual speakers: Behavioral and electrophysiological evidence

Janet van Hell

The Pennsylvania State University

A unique feature of bilingual speech is that bilinguals often produce utterances that switch between languages, such as "I ate **huevos para el desayuno**" [eggs for breakfast]. The large majority of psycholinguistic and neurocognitive studies examining switching between languages have focused on the processing of a series of single, unrelated items (e.g., unrelated words, numbers, or pictures) rather than switching between languages in a meaningful utterance (e.g., a sentence). However, an emergent body of studies seek to examine the cognitive and neural correlates of language switching in more naturally occurring situations: language switching within meaningful sentences. I will present recent psycholinguistic and electrophysiological studies that examined the cognitive and neural mechanisms associated with intra-sentential code-switching in production and comprehension. I will also discuss evidence showing that switching direction (switching from the first language to the second language, or vice versa) and accented speech modulate switching costs when bilinguals read or listen to code-switched sentences. Together these studies attest to the value of integrating linguistic and neurocognitive approaches to gain more insight into the neural, cognitive, and linguistic mechanisms of intra-sentential code-switching in comprehension and production.

The time-course of verbal morphology anticipation: When interpreting experience makes a difference

Cristina Lozano-Argüelles, Nuria Sagarra & Joseph Casillas

Rutgers University

There is a growing body of literature that recognizes the importance of anticipatory processes. Several prosodic cues are linked to prediction: Japanese intonation [1], Swedish tones [2] and English vowel duration [3]. Stress is phonologically contrastive in Spanish and English, but differently used for lexical disambiguation in each language [4, 5]. Explicit training of anticipation is related to better L2 predictive strategies [6]. However, we still don't know whether intensive experience with complex processing mechanisms (such as interpreting) could help with linguistic anticipatory processes. This study evaluates whether Spanish lexical stress can be used to predict verbal morphology in a second language (L2), and whether experience with interpreting improves L2 anticipatory processes.

Participants were: 25 Spanish monolinguals, 26 late L2 learners and 12 late L2 learners-interpreters. They completed a background-questionnaire, a proficiency test, an oral eye-tracking task, and a working memory (WM) test. The eye-tracking task contained 66 sentences (18 practice, 32 fillers, and 16 experimental). The target words had two conditions: paroxytone (stressed first syllable, *FIRma*, "s/he signs"), and oxytone (unstressed first syllable, *firMÓ*, "s/he signed") (*El director firma/firmó la factura*, "The director signs/signed the bill"). During the eye-tracking task, participants listened to a sentence while looking at two words and selected the word contained on the audio by pressing a button.

Participants were homogenous in L2 proficiency and WM. T-tests revealed that at the first syllable offset only monolinguals and interpreters were able to predict the ending (-*a* for present, -*o* for past). A GLMM showed that monolinguals and interpreters fixate on the target significantly more than the non-interpreter bilinguals. A Growth Curve Analysis indicated that monolinguals anticipate earlier, but interpreters do it at a faster rate. Results indicate that

interpreting experience facilitates anticipatory processing in an L2, and that this ability can be learned after puberty.
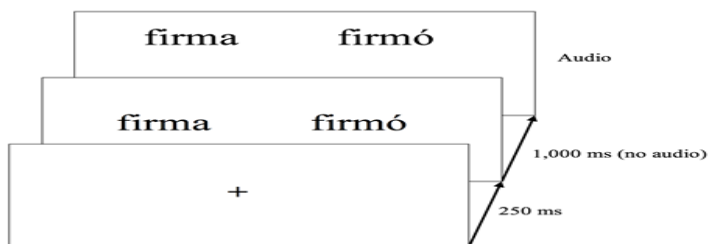
Figure 1: Eye-tracking task: Subjects saw a fixation cross for 250 ms, then got familiarized with the words for 1,000ms, and then listened to the sentence.
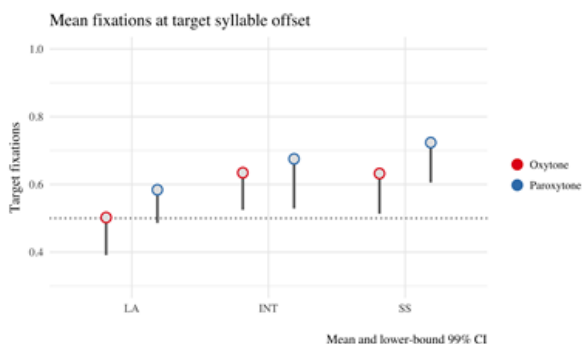
Figure 2: T-test of the fixations at the offset of the target syllable, indicating whether participants can anticipate against chance (50%) (Bonferroni corrected alpha = 0.0008).

References

[1] Nakamura, C., Arai, M., & Mazuka, R. (2012). Immediate use of prosody and context in predicting a syntactic structure. *Cognition*, *125*(2), 317–323.

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[6] Schremm, A., Hed, A., Horne, M., & Roll, M. (2017). Training predictive L2 processing with a digital game : Prototype promotes acquisition of anticipatory use of tone-suffix associations. *Computers & Education*, *114*, 206–221.

The nature of derivational priming in L2 learners: Surface form or lexical effects?

Vera Heyer

University of Braunschweig

While previous research has proposed that L2 learners, similarly to L1 speakers, decompose derived forms into base and affix (e.g., Diependaele, Duñabeitia, Morris, & Keuleers, 2011), recent studies (e.g., Heyer & Clahsen, 2015; Li, Taft, & Xu, 2017) have reported priming for purely orthographically related prime-target pairs in L2 groups, thus questioning the morphological nature of L2 priming effects for derived forms. It is as yet an open question whether these orthographic effects result from co-activation of orthographically related entries (on the lexical level; e.g., *surface → surfer*, *surf*, *surreal* etc.) or if they stem from a pure surface level (i.e., the letters activate all entries containing these letters and de-activation of activated entries is delayed).

This study uses real word and nonword primes to tease apart lexical and surface form effects. Forty L1 English and 40 German L2 English speakers saw verb targets (e.g., *surf*) preceded by one of five prime types: (1) derived words with *-er* (e.g., *surfer*), (2) derived nonwords with *-al* (e.g. *surfal*), (3) orthographically related words (e.g., *surface*), (4) orthographically related nonwords (e.g., *surfard*) and (5) unrelated words (e.g., *therapy*) at an SOA of 50 milliseconds.

Preliminary linear mixed-effects analyses indicate an interaction between Group and Prime Type, reflecting that both groups showed priming for (1), (2) and (4) but differed with respect to orthographic priming, with only the L2ers recognising targets faster after orthographic primes (see Table 1 for *t*-values). Importantly, L2 (yet not L1) priming is independent of the prime being an existing word

These results rule out a lexical source for these effects and thus add critical evidence for the orthographic (rather than morphological) nature of priming for derived forms in L2.

Table 1: Overview of results from linear mixed-effects regression models on the L1 and L2 data. [Models were run on inverse-transformed data, with "unrelated" as baseline for the factor Prime Type, thus determining if the facilitation was significant.]

Priming effects for	L1 Group	L2 Group
(1) Derived words	t = 2.54*	t = 3.12*
(2) Derived nonwords	t = 2.14*	t = 1.89[(*)]
(3) Orthographic words	t = 0.58	t = 2.70*
(4) Orthographic nonwords	t = 2.33*	t = 2.20*

*significant at .05 level   (*) considered as marginally significant

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Persistent differences between native speakers and late bilinguals: Evidence from inflectional and derivational processing in older speakers

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Although the often positive effects of lifelong bilingualism on cognitive functioning at old age have been the subject of a large number of studies, considerably less is known about the linguistic skills of L2 speakers as they get older, particularly with regards to grammatical processing. In the current study we investigated how aging affects language performance, specifically morphological processing, in both L1 and L2 speakers.

Previous studies with younger adults have found differences between native (L1) and non-native late bilingual (L2) speakers with regard to processing of morphologically complex words. Moreover, several studies e.g. Jacob, Heyer, and Veríssimo (in press), have revealed a contrast between how inflected and derived word forms are processed by younger L1 and L2 speakers which may reflect the distinction between a purely grammatical process which spells out morphosyntactic features and a lexical process which produces new lexical entries.

Against this background, we tested older L1 and L2 speakers' masked-priming effects for derived and inflected word forms of German and compared them to results from younger L1 and L2 speakers on the same experiment (mean ages: 62 vs. 24). Across conditions, we observed slower response times paired with higher accuracy scores for older than for younger participants, in both the L1 and the L2 groups. The priming patterns, however, were not affected by aging. While both L1 and L2 speakers showed robust derivational priming, only the L1 speakers demonstrated inflectional priming (see Table 1). We argue that general performance (viz., speed, accuracy) are affected by aging in both L1 and L2, but that differences between native and non-native processing are more profound and persist into old age.

Table 1: Overview of RTs and accuracy rates for the morphological for the four groups.

			Morphological Set							
			L1				**L2**			
			identity	derived	inflected	unrelated	identity	derived	inflected	unrelated
Younger*	RT	mean	569	618	609	638	711	725	751	767
		(SD)	(126)	(119)	(114)	(133)	(151)	(150)	(172)	(154)
		accuracy	96.0 %	97.2 %	96.0 %	93.3 %	96.4 %	96.4 %	95.2 %	93.7 %
Older	RT	mean	588	615	622	647	704	751	782	778
		(SD)	(105)	(133)	(138)	(115)	(154)	(162)	(175)	(181)
		accuracy	99.2 %	99.6 %	99.2 %	98.4 %	99.2 %	97.6 %	98.8 %	98.0 %

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(Re)exploring the effect of the bilingual experience on brain structure

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The use of more than one language affects the structure of the brain and likely higher order cognitive processes (executive functions) (Bialystok, 2016a, b). However, the connection between bilingualism and neurocognitive changes remains poorly understood, given that results across studies are variable regarding both neurological (García-Pentón et al., 2015; Pliatsikas & Luk, 2016) and cognitive effects (Valian, 2015). A more nuanced examination of the different (linguistic) experiences of bilingualism is needed to assess its potential cognitive/neurological impacts (Luk and Bialystok, 2013) and these how these neural outcomes are modulated with changes in non-native language experience and ability (Abutalebi and Green, 2016; Grundy, Anderson, & Bialystok, 2017). This ongoing project examines bilingualism as a spectrum, specifically assessing the effect of specific factors within the bilingual experience, using a combination of behavioral and neuroimaging (MRI) methods.

Typically developing bilinguals (n= 65, 52 female, Mage= 31.8yrs, SD 7.59) were scanned for grey matter (GM) and white matter (WM), completed an English proficiency test (Oxford QPT; Geranpayeh, 2003), and a language background questionnaire (LSBQ) (Anderson et al., 2017; Luk & Bialystok, 2013). Demographics from the LSBQ, including length of second language (L2) immersion, bilingualism composite score (BCS), average switching, and L2 age of acquisition (L2 AoA) were run as predictors in analyses on the acquired structural.

Preliminary results show that different experiential factors within the bilingual experience variably affect the brain. For example, L2AoA was found to predict differences in cortical GM and WM tracts (specifically left and frontal regions) (Fig. 1), whereas length of L2 immersion was found to predict GM volume increases in the

parahippocampal gyrus and decreases in the hippocampus (Fig. 2). Results are discussed further in detail. Taken together, the data indicate that bilingualism is a dynamic process which crucially is modulated through time with changes to linguistic exposure and use.
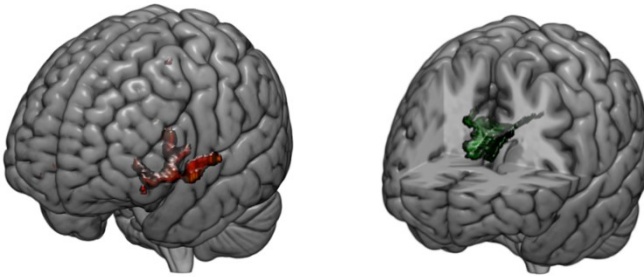

Figure 1: Cortical grey matter differences (red, left) and white matter differences (green, right) as predicted by L2 AoA.
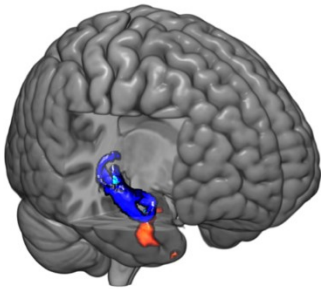

Figure 2: Grey matter decreases (light blue) in the hippocampus (blue), and grey matter increases in parahippocampal gyrus (red), as predicted by length of immersion.

ERP evidence for attrition in L1 lexicon and morpho-syntax

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This paper gives an overview of the first large-scale event-related brain potential (ERP) studies on L1 attrition and discusses their implications for our understanding of the bilingual brain. First, we will present ERP data that extend attriters' own reports of lexical problems in their L1 and illustrate how similar words are confused as a function of language dominance and proficiency [1,2]. Next, we will address the highly controversial question of whether L1 morpho-syntax may be subject to attrition in adult migrants. One previous ERP study on grammatical gender failed to find clear ERP differences between German migrants and monolinguals and concluded that morpho-syntax in general may not be subject to L1 attrition effects [3]. However, our own work testing a range of grammatical structures in Italian immigrants in Montreal clearly shows that they processed Italian sentences differently than monolinguals, especially when English had become their dominant language [4-6]. Strikingly, L2-dominant attriters were found to perceive a grammatical sentence in their L1 as ungrammatical, if it violated the L2 grammar [5]. As a whole, the ERP data available provide initial physiological evidence that L1 attrition in adult migrants' brains occurs at both lexical and morpho-syntactic levels of processing, modulated by the degree of exposure to the two languages. Together with other evidence from late L2 learners [7], the data suggest that the adult brain remains plastic for both L2 and L1. Where ERP data patterns seem inconsistent across studies from different labs, we discuss potential underlying reasons [6,8]. We will also briefly touch upon how L1 attrition may positively influence one's L2, due to greater L1 inhibition and therefore less interference.

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When switching language is cost-free

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The goal of this study is to determine to what extent language switching in bilingual speakers is a costly process. It is widely agreed that when bilinguals use one language, the other one is inhibited. In order to switch language, this inhibition needs to be overcome leading to the so-called "language switching costs" [1]. Previous studies have shown that when speakers are given time to prepare for the upcoming language, switching costs are reduced or even eliminated [2, 3]. Specifically, it has been shown that when the interval between trials is relatively long, a preparation time of 800ms allows bilinguals to switch cost-free [3]. While this result indicates that is possible to eliminate switching costs, it leaves unclear how much preparation time is necessary to fully prepare for a language switch and so to switch cost-free.

We tested 30 native speakers of Dutch (mean age: 22 years; 6 males) with a good proficiency of English (81.5% of the LexTale [4], L2 mean AoA: 10.4 years) in a picture naming task involving language switching. The interval between trials was held relatively long (> 3000ms), whilst preparation time was manipulated by displaying the language cue *before* the stimuli (Cue to Stimulus Interval, CSI= 800ms, 500ms, and 250ms) and *together* with the stimuli (CSI= 0ms).

Results revealed that language switching was costly when speakers were given no time to prepare but not when some preparation time was provided. Precisely, language switching became cost-free when preparation time was relatively long (800ms and 500ms) but also when preparation time was as short as 250ms. This finding suggests that the system requires less than 250ms to fully prepare for a language switch. The study will discuss the implications of these results for current models of bilingual language switching in production.
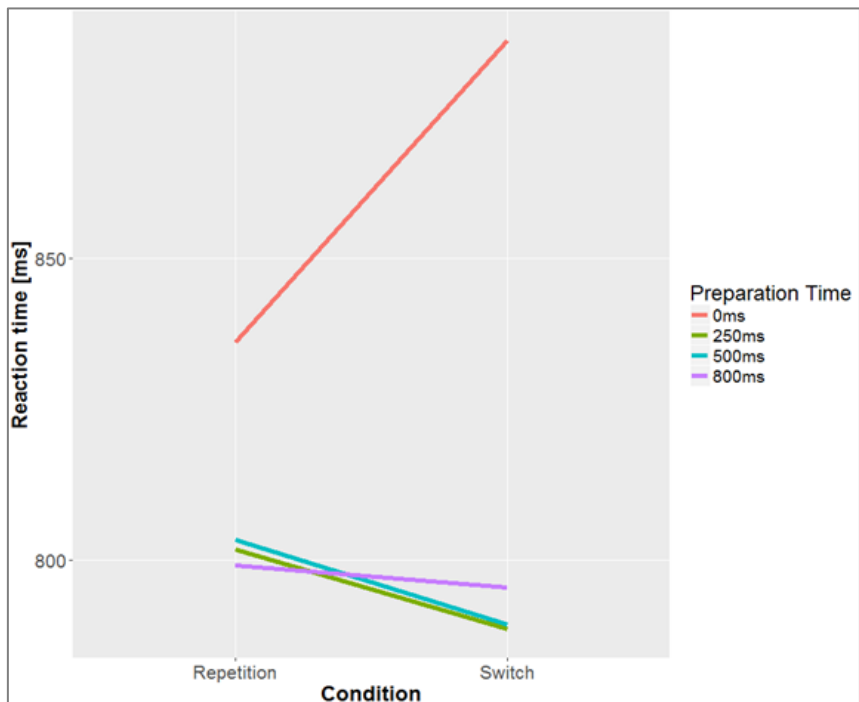
Figure 1. Language switching costs as a function of preparation time (0ms, 250ms, 500ms and 800ms). Switching costs are measured as the difference in mean reaction times between *Repetition* trials (same language as the preceding trial) and *Switch* trials (different language compared to the preceding trial).

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Code-switching from Dutch to Frisian requires more cognitive control than code-switching from Frisian to Dutch

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Recent research suggests that cognitive control plays a role in code-switching, both in bilingual adults (Verreyt, Woumans, Vandelanotte, Szmalec, & Duyck, 2016) and in bilingual children (Gross & Kaushanskaya, 2015). Code-switching would only require cognitive control, however, when bilinguals maintain some degree of separation between their two languages; it would not require cognitive control when bilingual speakers completely mix their two lexicons and grammars (Green & Wei, 2014).

The Frisian-Dutch bilingual context is interesting in this respect because mixing of Dutch (the majority language) into Frisian (the minority language) is common, but mixing of Frisian into Dutch is not (Breuker, 2001). Therefore, Frisian-Dutch bilingual speakers need to maintain some degree of language separation when they speak Dutch, but not when they speak Frisian. This leads to the prediction that code-switching from Dutch to Frisian practises cognitive control, while code-switching from Frisian to Dutch does not.

To test this hypothesis, we analyzed data from 120 5- and 6-year-old Frisian-Dutch bilingual children. Cognitive control was measured with a Flanker task and information about children's code-switching behavior was obtained through a parental questionnaire. Age, non-verbal IQ, SES, Frisian and Dutch language scores were included as control variables.

Multiple regression analyses showed that frequency of code-switching from Dutch to Frisian significantly predicted performance on the Flanker task, $\beta = -.24$, $p = .03$, but that frequency of code-switching from Frisian to Dutch did not, $\beta = .08$, $p = .45$. This suggests that switching from a majority to a minority language is related to cognitive control, whereas switching from a minority to a majority language is not.

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Individual differences in bilingual grammars

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Individual speakers show substantial variability in language processing patterns [1]. Can individual grammars also be similarly divergent? To answer this question, we used the architecture of Gradient Symbolic Computation (GSC) [2,3] to model bilingual grammars for 93 individuals, based on pre-existing data from a set of four Dutch-English code-switching experiments [4]. In these experiments, participants were prompted in Dutch or English to produce an utterance which could be SVO, VSO, or SOV in Dutch, but only SVO in English. Participants were also prompted to switch languages in various locations. The results were therefore a set of transitive sentences coded for word order, prompted language, and language switching locations. We asked how variable the 93 individual bilingual grammars could be, and how much they diverged from the population-level grammar.

To construct these bilingual grammars, we used a set of six constraints (Table 1), each of which requires an English-specific and a Dutch-specific weight. From these, the model generates a set of probabilities across all possible responses to the experimental prompts. We define the grammar as the optimal set of constraint weights, which generate a probability distribution that maximally correlates with the actual distribution of responses. Using a random-walk based algorithm, we determined the optimal weights, or grammars, for all 93 individuals, based on their specific response distributions. We then compared the individual grammars to the population-level grammar, generated by finding the optimal set of weights for the full dataset.

Individual grammars showed substantial variability for some constraints, (Figure 1), while still consistently reaching a correlation of above 0.9 between predicted and actual response distributions. This work therefore serves as a proof of concept for the GSC

architecture in modeling bilingual grammars, and suggests that individual differences research should consider variation in grammars as well as language processing patterns.
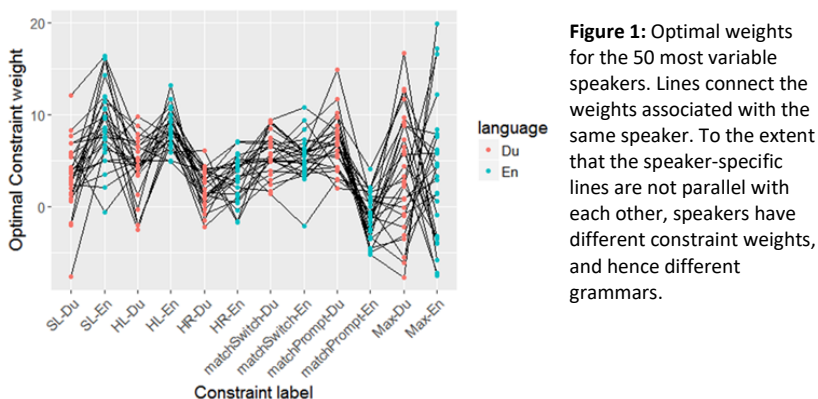

Figure 1: Optimal weights for the 50 most variable speakers. Lines connect the weights associated with the same speaker. To the extent that the speaker-specific lines are not parallel with each other, speakers have different constraint weights, and hence different grammars.

Table 1: Summary of constraints. SL, HL, HR are markedness constraints and govern the output word order. The others are faithfulness constraints. As this is a bilingual grammar, all constraints have an English-specific weight and a Dutch-specific weight.

SpecLeft (SL)	Keep specifier on left edge of clause
HeadLeft(HL)	Keep head on left edge of clause
HeadRight(HR)	Keep head on right edge of clause
matchSwitch	Switch languages at the prompted location
matchPrompt	Use the prompted word order
Max	Do not omit constituents

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Language production practice improves comprehension performance on grammatical dependencies in early L2 learning

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Whereas research in L2 acquisition has emphasized the role of comprehension practice in learning (Krashen, 2003; VanPatten, 2013), memory research has suggested that language production provides a better learning opportunity than comprehension (Hopman & MacDonald, in press; MacLeod & Bodner, 2017). We tested the hypothesis that production practice yields improved second language learning and comprehension compared to comprehension practice itself, using an artificial language learning task. The language, which described a cartoon world, consisted of 20 different words of 7 word types. Four word types (Det., Adj., Noun, Verb) contained suffixes agreeing in number and noun class (Fig. 1a). English speakers learned the language via a Comprehension, Production, or Mixed learning method (52 participants in each). All conditions had the same number of learning trials and intermixed passive spoken language exposure with an active task. Comprehension learners matched an auditory phrase with a picture, but never spoke. Production learners described pictures aloud in the artificial language, with no comprehension task. Mixed learners had both production and comprehension (matching) practice in a ratio of 1 production to 5 matching trials. Afterwards, participants were tested on speed and accuracy comprehending grammatical dependencies in spoken phrases (Fig. 1b). A contrast analysis confirmed our hypothesis: production-based learners performed best on comprehension speed and accuracy, followed by the mixed learners and then comprehension-based learners (Fig. 2). Our results are in line with other research suggesting that production practice can help improve second language learning (DeKeyser & Sokalski, 1996; Izumi, 2003; Swain & Lapkin, 1995), and contribute to the growing knowledge base about the merits of comprehension-based

versus production-based L2 instruction (Shintani, Li & Ellis, 2013). Inconsistency with prior L2 critiques of production learning may be resolved by distinguishing the full sentence generation here vs. simple repetition used as "production" practice in some L2 classrooms.
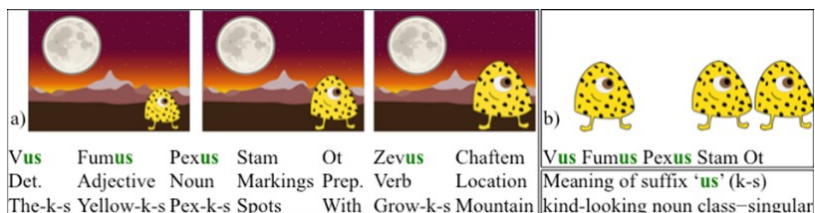

Vus	Fumus	Pexus	Stam	Ot	Zevus	Chaftem	Vus Fumus Pexus Stam Ot
Det.	Adjective	Noun	Markings	Prep.	Verb	Location	Meaning of suffix 'us' (k-s)
The-k-s	Yellow-k-s	Pex-k-s	Spots	With	Grow-k-s	Mountain	kind-looking noun class−singular

Figure 1: In the real experiment, all language input was auditory, participants never saw written language. a) Participants learn the language during passive exposure trials by seeing videos (represented here by still frames) and hearing phrases. b) example test item (correct answer left).
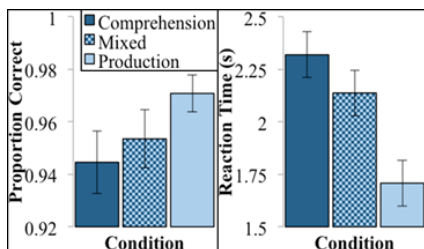

Figure 2. Results of the forced choice test of suffix understanding, collapsed over grammatical dependency. Both for accuracy and reaction time a contrast analysis supports our hypothesis that the Production participants perform best, followed by the Mixed and finally the Comprehension condition (better = more accurate, shorter reaction time).

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Reanalysis processes in non-native sentence comprehension

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Studies show non-native speakers (L2ers) misinterpret garden-path sentences like (1b) more frequently than native speakers (L1ers) [3,4]. One account of this is that L2ers have a reduced syntactic processing ability [1]. Alternatively, reanalysis may be complete but L2ers have difficulty erasing the initial interpretation from memory [2]. To clarify L2ers' reanalysis processes, we conducted two experiments with 40 intermediate-advanced L2ers and 40 L1 English speakers.

In Experiment 1 (Ex1), participants read 24 ambiguous (1b) and unambiguous (1a) sentences and answered comprehension questions like (2), which tap reanalysis of the subordinate clause (2a) and main clause (2b). In Experiment 2 (Ex2), adapted from [5], participants read 24 sentences like (3) while their eye-movements were monitored. (3a/3b) are ambiguous while (3c/3d) are unambiguous. Additionally, the gender relation between the reflexive and its antecedent was matched ('Ken's dad/himself') in (3a/3c) and mismatched ('Ken's mum/himself') in (3b/3d). We expected lower accuracy rates (Ex1) and longer reading times (Ex2) for ambiguous sentences. If syntactic reanalysis is complete, we expected similar gender mismatch effects in (3a/b) and (3c/d). If reanalysis is incomplete in either group, we expected reduced/absent gender mismatch effects in ambiguous (3a/b) than unambiguous (3c/d).

In Ex1, accuracy rates were significantly lower in ambiguous sentences. In Ex2, reading times were significantly longer in ambiguous sentences at the disambiguating verb ('decided'). A significant main effect of gender was observed at the reflexive ('himself'), with longer reading times following gender mismatches, in the absence of interactions with ambiguity. Effects did not interact with group in either experiment, suggesting reanalysis is syntactically complete in both groups.

In contrast to previous results [3,4], L2ers did not misinterpret garden-path sentences more than L1ers. For both groups, the primary source of difficulty appeared to be persistence of the initially-assigned interpretation in memory, rather than an inability to complete syntactic reanalysis.

(1a)   After Mary dressed, the boy in the house started cleaning the room.
(1b)   After Mary dressed the boy in the house started cleaning the room.
(2a)   What happened? 1. Mary dressed herself 2. Mary dressed the boy
(2b)   Who started cleaning the room? 1. Mary 2. The boy

(3a)   After the neighbour visited Ken's dad decided to prepare himself a cold drink.
(3b)   After the neighbour visited Ken's mum decided to prepare himself a cold drink.
(3c)   After the neighbour visited, Ken's dad decided to prepare himself a cold drink.
(3d)   After the neighbour visited, Ken's mum decided to prepare himself a cold drink.

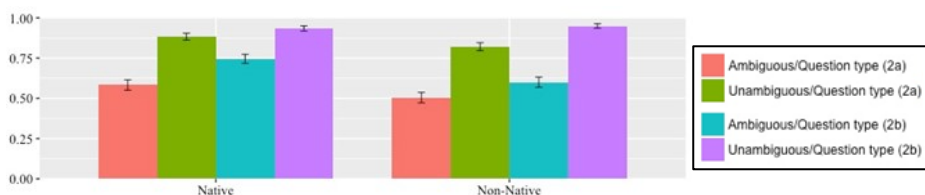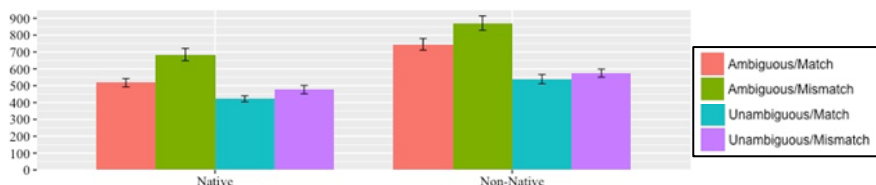**Figure 1**: Proportion of correct responses

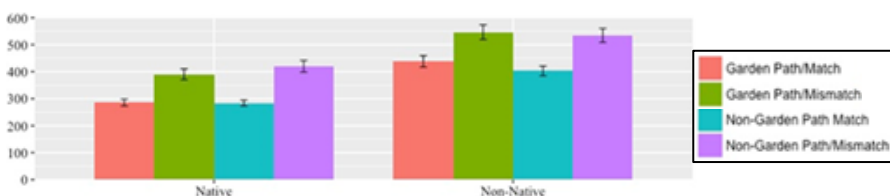**Figure 2**: Total viewing times at the disambiguating verb.

Figure 3: Total viewing times at the reflexive.

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The use of case marking to predict an upcoming thematic role in L1 and L2 processing

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Using the visual-world eye-tracking paradigm, we examined whether non-native comprehenders (L2s) can use case marking to anticipate upcoming information during processing. The results from previous visual-world studies [1, 2] showed that only L1s used case cues predictively, but these studies tested L2s who were not highly proficient and/or whose L1 lacked a proper case system. We tested a group of German L1s (n=28) and highly proficient L2s with Russian as L1 (n=25) on their ability to use case marking for predicting an upcoming argument. All experimental sentences contained ditransitive verbs which allow for two alternative argument linearisation patterns (DAT>ACC vs. ACC>DAT) as illustrated in examples (a) and (b).

(a) Der Gärtner gibt <u>der</u> blühen<u>den</u> {Pflanze eilig} frisches Wasser.
    The gardener$_{NOM}$ gives the flowering$_{DAT}$ {plant   quickly} fresh   water$_{ACC}$

(b) Der Gärtner gibt <u>die</u> blühende {Pflanze eilig} dem Postboten.
    The gardener$_{NOM}$ gives the flowering$_{ACC}$ {plant   quickly} the postman$_{DAT}$

Dative marking indicates a Recipient argument and accusative marking a Theme, so that the case marking on the first postverbal noun phrase should trigger an expectation for either a Theme (a) or a Recipient (b). Parentheses indicate the critical window for anticipatory eye movements, where we should see more looks to the target *water* (possible Theme) compared to *postman* (possible Recipient) in (a), and vice versa in (b).

For L1s, preliminary analyses show an increase in looks to target compared to competitor within the critical window for (a) but not (b), indicating that for the more marked word order in (b), the L1s experience a processing delay. For the L2s, the predicted effect is delayed for (a) and absent for (b), where we see evidence of competition between target and competitor instead (Figure 1). This

indicates a reduced ability to use case marking as a predictive cue in L2 compared to L1 processing.
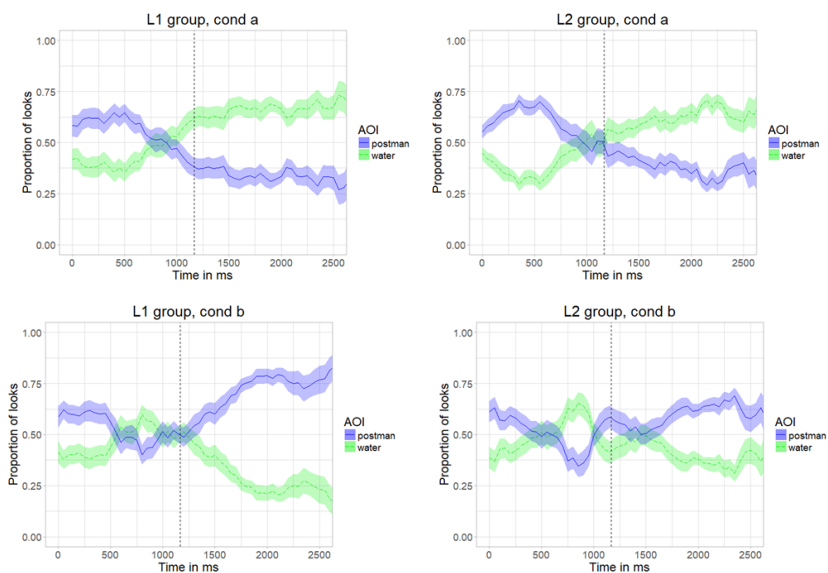
Figure 1: Proportion of looks to target vs. competitor after the onset of the critical time window; the dashed vertical line marks the mean onset of the final argument shifted 200ms forwards to account for eye movement latency.

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Gender attraction in native and heritage Greek

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This study investigates effects of gender attraction in comprehension by native and heritage speakers (HSs) of Greek. Attraction occurs when agreement errors go undetected due to retrieval interference. To date, very few studies have addressed how early bilinguals react to attraction in production and/or comprehension (Scontras et al., 2018: heritage speakers; Veenstra et al., 2017: bilingual children). The present study investigates whether HSs of Greek exhibit same, greater, or weaker attraction effects compared to monolingual controls in structures involving past-participles and object-clitics. Two baseline tasks on gender assignment and agreement revealed that HSs perform well in these dependencies. To test gender attraction effects, a self-paced listening task was used with neuter and feminine nouns matched on length and frequency. The data were analysed using linear mixed-effects models in the log-transformed listening times (raw data produced similar results). Preliminary findings by 36 HSs and 37 monolingual controls showed that in past-participles, only monolinguals showed attraction (shorter reaction times in the ungrammatical mismatch condition compared to the ungrammatical match condition) and only with feminine heads. HSs exhibited only grammaticality effects. Both groups reacted to all ungrammaticalities with neuter heads; the effects in HSs occurred in the critical segment, but in monolinguals only post-critically. In object-clitics, attraction arises but is not modulated by group or head. Exploratory analyses revealed that the effect was attributed to the monolingual pattern with feminines again. HSs exhibited flat RTs (especially with feminines). Overall, HSs, who are early and quite balanced bilinguals, are less prone to attraction than monolinguals in line with Veenstra et al. (2017) who found that bilinguals made marginally fewer number attraction errors. The asymmetry between the grammaticality effects of HSs in past-participles and their absence in object-clitics can be captured under the Interface

Hypothesis (Sorace, 2011); gender agreement at the internal vs. external interface.

SET 1 feminine head-nouns

Critical region

C1 vríke | ti sidaɣí | ɣia tin pítsa | skisméni | ... grammatical match
He found   the recipe.FEM for the pizza.FEM   torn.FEM

*C2 vríke | ti sidaɣí | ɣia tin pítsa | skisméno | ... ungrammatical match
He found   the recipe.FEM for the pizza.FEM   torn.NEUT

C3 vríke | ti sidaɣí | ɣia to psomí | skisméni | ... grammatical mismatch
He found   the recipe.FEM for the bread.NEUT   torn.FEM

*C4 vríke | ti sidaɣí | ɣia to psomí | skisméno | ...ungrammatical mismatch
He found   the recipe.FEM for the bread.NEUT   torn.NEUT

Figure 1: Example of experimental sentences across all conditions (C1-C4) in the experiment with the past-participles as agreement targets. The Critical region is the past-participle *skismeni/skismeno* (*torn*).

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Gender representation and processing in Russian-German bilinguals

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Despite previous studies on gender processing in L2 comprehension (cf. Paris & Weber 2004, Lemhöfer et al. 2008, Hopp 2013), the question of how gender is represented and processed online in bilinguals whose L1 and L2 both have a similar gender system have not received a definite answer. We ask, do nouns in both languages share the same abstract gender nodes?

To answer this, we presented fifteen advanced to near-native adult L1 Russian speakers of L2 German (critical group) and 15 native speakers of German (control group) with visual stimuli, each of which showed three different objects. In all trials, all participants heard a German sentence fragment (e.g., "dieser[DET-MASCULINE] schwarze[ADJ] Computer[NOUN-MASCULINE]" 'that black computer'), which, according to the instructions, cued them to click on the object whose name was mentioned (target). In the critical condition, the stimuli were constructed in such a way that the name of one of the two non-target objects in the L2ers L1 (Russian) was congruent with the gender information encoded in the determiner (gender-congruent L1 competitor). The third object's name was not gender-congruent in neither language (distractor). In the control condition, neither of the two non-target objects were gender-congruent with the determiner (see Fig. 1).

Results from the control condition show that L1ers and L2ers clearly anticipate targets, which suggests that all participants were able to match gender information derived from the determiner with gender information associated with the object names. However, in the critical condition, L2ers showed significantly more attention to gender-congruent competitors before target onset than L1ers (see Fig. 2). Taken together, these results suggest that in advanced to near-native L2ers, whose L1 has a similar gender system as their L2,

gender is represented by shared abstract gender nodes, which can be activated from one language to the other.
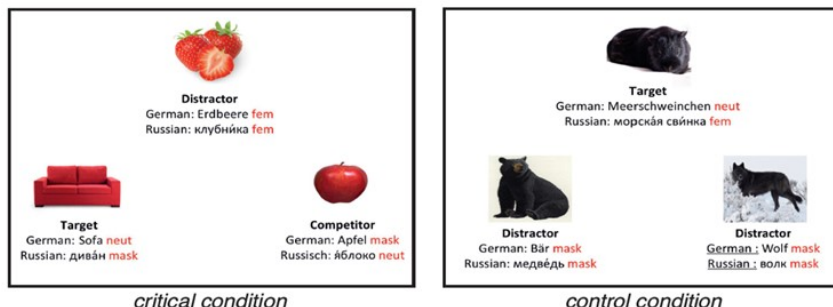
Figure 1: Example stimuli for both conditions
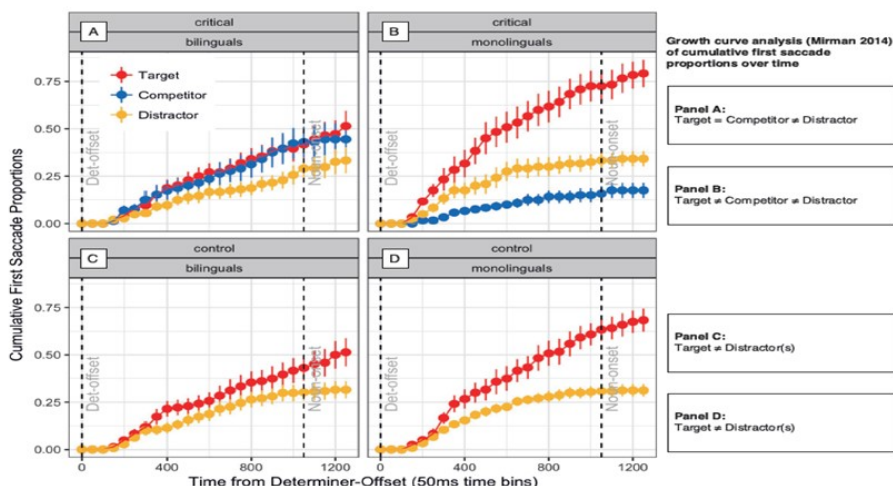
Figure 2. AOIs within groups over conditions

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How classifiers facilitate processing in L2 Chinese

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L2 processing has been argued to rely more on lexico-semantic and less on grammatical information than L1 processing (Felser et al., 2003; VanPatten, 2004). Chinese classifiers provide a unique opportunity to test this claim. Shape classifiers (e.g., *tiáo*, 'long/narrow') generally co-occur with nouns denoting objects with the relevant shape properties (e.g., *shéngzi*, 'rope'). Yet most classifier classes also contain nouns not obviously matching these features (e.g., *gǒu*, 'dog'; in '*tiáo*' class); for these, classifier-noun co-occurrence constraints are largely agreement-like (similar to Det-N gender-agreement). Using the visual-world paradigm, Tsang and Chambers (2011; 'T&C') investigated to what extent native Cantonese listeners derive predictions from semantic vs. grammatical/form-class constraints on classifier-noun co-occurrence. They found classifiers facilitated Cantonese speakers' processing "primarily through their grammatical constraints", with little distraction from competitors matching the classifier only in semantics but not form-class (e.g., *shǒubiǎo* 'wristwatch', which is long/narrow, but cannot co-occur with *tiáo*). If semantics plays a stronger role in L2 processing, we predict larger competition effects from such competitors among L2 listeners.

We test this prediction in a Mandarin adaptation of T&C's experiment. Participants listened to questions (1) while viewing scenes containing a (non-prototypical) target (e.g., 'dog'), competitor and distractor (Fig1). Competitors differed by condition, representing either a member of the target classifier class ('rope'; G+S+), a member of a different class with some of the target class' semantic properties ('wristwatch'; G-S+), or an entirely unrelated noun (*píngguǒ* 'apple'; G-S-). In the L1 group (n=24), eye-gaze patterns (Fig2) in the G-S+ and G-S- conditions align, indicating no influence of classifier-semantics from class-inconsistent competitors. In the L2 group (19 L1-English advanced learners; data-collection on-going), the G-S+ and G+S+ conditions align, suggesting L2ers are influenced

by classifier-semantics *regardless* of grammatical noun-class constraints. These patterns (supported by mixed-effect regression models) provide support for greater reliance on lexico-semantics in L2 vs L1 *predictive processing*.

(1)   *Nǎ   yī   tiáo   shì   gǒu?*
       Which one   CL$_{\text{LONG-THING}}$ is   dog?
       'Which one is a/the dog?'

G+S+

G-S+

G-S-
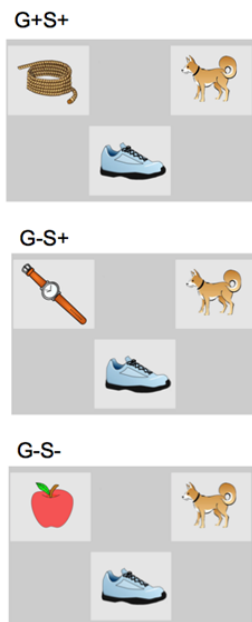
Figure 1: Visual scenes
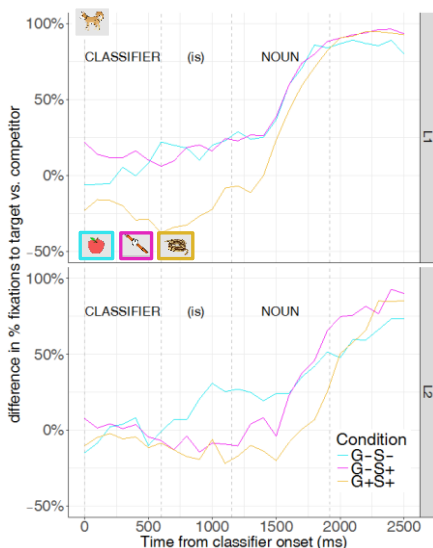
Figure 2: Difference in proportion fixations to target vs competitor, by Condition and Group.
(A positive value indicates more looks to the target than to the competitor, a negative value indicates more looks to the competitor; zero indicates an equal proportion of looks to the target and the competitor.)

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Lexical access in auditory and visual word recognition: An eye tracking study with monolingual and bilingual children

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Previous research has shown that bilingual adults activate both their lexical systems simultaneously during tasks where they had to choose between lexical items that were phonologically similar (Marian and Spivey (2003), Blumenfeld and Marian (2007)). In particular, both within as well as across language competition affected their lexical access (Marian, Blumenfeld, & Boukrina, 2008) but varied according to the number of phonologically similar items (neighbourhood density) as well as task demand.

The present study addresses the questions a) whether within as well as across languages effects can also be observed in bilingual school-age children and b) how the mode of presentation (auditory vs visual) affects their lexical access.

Subjects for the study include 26 monolingual English and 26 bilingual German-English children of primary school age (6 – 8) living in the UK. Half of the children were assigned to the auditory and half to the visual presentation mode. They were first asked to name pictures of the target items and their reaction time as well as accuracy were measured (Task 1). They were then given a visual world paradigm (Task 2) where they were presented with 32 arrays of four pictures and either a spoken or a written word. Target words overlapped in phonological form with a competitor either within or across languages. Eye fixations were measured using a mobile eye tracker (SMI Red 250).

The results for Task 1 show that the monolingual children were faster and more accurate than the bilinguals. The results of Task 2 show that monolinguals and bilinguals were affected by within-language competition for low density targets, though to a lesser extent in the visual presentation mode. As expected, only the bilingual children were affected by cross-language similarity. The

results confirm simultaneous lexical activation for bilingual children and show differences between presentation modes.

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Language detection in the early stages of the bilingual lexicon

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Recent findings on the mechanisms of lexical access provide evidence that bilinguals are sensitive to the orthographic structure of their languages. Several studies on bilingual word recognition have demonstrated that if presented with language-specific sub-lexical cues, bilingual participants show reduced interference from the non-target language (e.g., Casaponsa, Carreiras, & Duñabeitia, 2014). As this challenges the widely accepted view of language non-selective lexical access, the BIA+ model (Dijkstra & van Heuven, 2002) has recently been extended by the introduction of sub-lexical language nodes (van Kesteren, Dijkstra, & de Smedt, 2015). Providing evidence for language-selective access, studies using nonwords with different degrees of cross-linguistic similarity showed a significant impact of language-specificity on participants' rejection performance (e.g., Lemhöfer & Radach, 2009). Along with similar findings supporting the processing of language-specific sub-lexical cues, this has been taken as evidence that language detection in bilingual adults is not necessarily executed on the lexical level but can also happen based on sub-lexical information, i.e. at an earlier point in the recognition process.

The aim of the present study was to test the applicability of the BIA+ extended model by investigating the presence of sub-lexical language nodes in balanced bilingual children. Forty-six German-English third-graders, controlled for their nonword reading skills in both languages, performed two language-specific lexical decision tasks, which both contained English-like and German-like nonwords. Results revealed no impact of language-specificity on rejection performance in either language, which indicates that children did not make use of language-specific sub-lexical information. We interpret this as evidence that bilingual lexical access is initially language non-selective, and that sensitivity to language-specific orthographic

structures first emerges over time. In contrast to adults, language detection in children seems to exclusively depend on lexical information, which argues for the absence of sub-lexical nodes in the early stages of the bilingual lexicon.

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Recent-event effects in bilingual language comprehension: Evidence from eye-tracking

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Recently seen events influence gaze patterns during language comprehension. When monolingual participants see an action event and they hear a related sentence, they preferentially inspect targets of recent events over plausible future-event targets, independent of tense information [1, 2]. Bilinguals, who experience increased processing demands due to competition between their two languages [5], may have weaker lexical access [3] and weaker predictive processing abilities [4] relative to monolingual speakers. It is currently unclear how bilinguals can use recent event information as predictive cues and how much they rely on visual cues during spoken sentence processing.

The current eye-tracking study (*N* = 32) examined English-French bilinguals' reliance on recently seen events, focusing on their ability to predict a plausible future action during spoken sentence comprehension. Bilinguals, all exposed to both languages before the age of five, saw a videotaped actor performing an action (e.g., sweetening strawberries, Fig. 1A-a) and then listened to an English (NP1-Aux-Verb-NP2) sentence (e.g., *The experimenter has sweetened the strawberries*) referring to that recently performed action or heard an alternative sentence (e.g., *The experimenter will sweeten the pancakes*) referring to an equally plausible action that the actor would perform next (sweetening pancakes, Fig. 1A-c). Eye movements to the recent and future objects were analyzed from the auxiliary verb onset until the end of sentences (Fig. 1B).

Preliminary results indicate that bilinguals performed similarly to monolinguals, preferring to inspect recent-event targets when exposed to both tenses (referring to a recent vs. future action). Although bilinguals showed a decrease in eye-gaze frequency toward recent-event targets (compared to monolinguals [1, 2]) when

listening to future sentences, they inspected the recent target more than the plausible future-event targets. Bilinguals and monolinguals thus appear to be constrained by similar processing biases in their comprehension of spoken discourse in the presence of visual information.
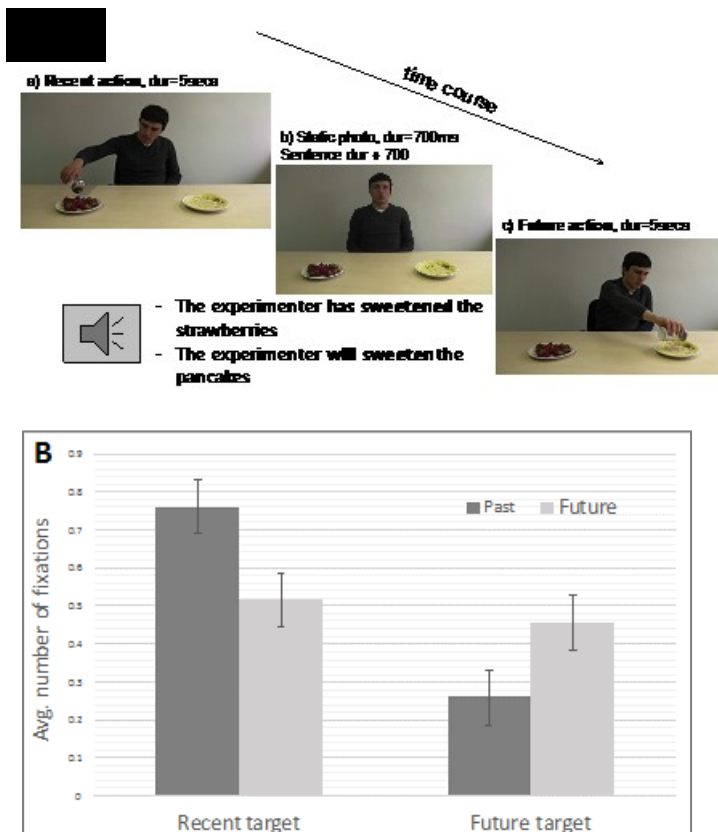

Figure 1: (A) Sequence of events in an experimental trail. (B) Average number of fixations from auxiliary onset until the end of sentence

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# L2 English genitive choices of L1 Spanish speakers

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Previous studies have shown evidence of cross-linguistic transfer in early L2 acquisition of the Saxon genitive amongst L1 Spanish speakers, including an erroneous or non-native-like overuse of the prepositional genitive in its place. Little research exists on how long these difficulties persist and whether the advanced L2 English speaker still struggles with the necessary distinctions between Saxon genitive and prepositional genitive constructions.

This study uses judgement data tasks to elicit responses from a group of L1 Spanish speakers with an advanced level of L2 English regarding the acceptability of Saxon genitive and prepositional constructions, using a control group of L1 English speakers. Both groups responded first with acceptability judgements of sentences containing either Saxon or prepositional genitive constructions. The groups were then given sentence pairs that differed only in their choice of genitive construction and asked to assess which sentence was more acceptable.

The results revealed that native language did indeed influence participants' genitive choices. The L1 Spanish participants judged the prepositional genitive constructions more harshly than the L1 English speakers did, while there was no significant difference in their respective judgements of the Saxon genitive constructions. Further, the L1 Spanish speakers were more discerning in their judgements of the sentence pairs, assessing only one of the two genitive constructions acceptable in their given contexts more frequently than the L1 English speakers did, while the L1 English speakers were more likely to find both forms acceptable.

Overall, the study provides evidence for cross-linguistic transfer persisting into the latter stages of L2 acquisition, while suggesting that the L1 Spanish speakers' non-native use of genitive constructions may develop into overuse of the Saxon genitive and underuse of the prepositional genitive construction.
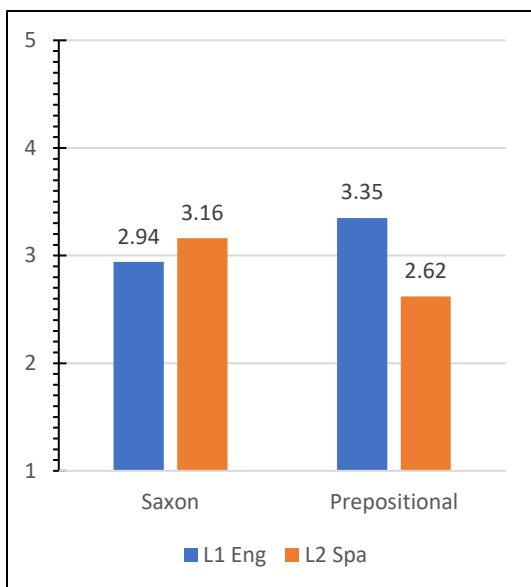
Experiment 1: Mean acceptability ratings of both native English (L1 Eng) and native Spanish speakers (L1 Spa).
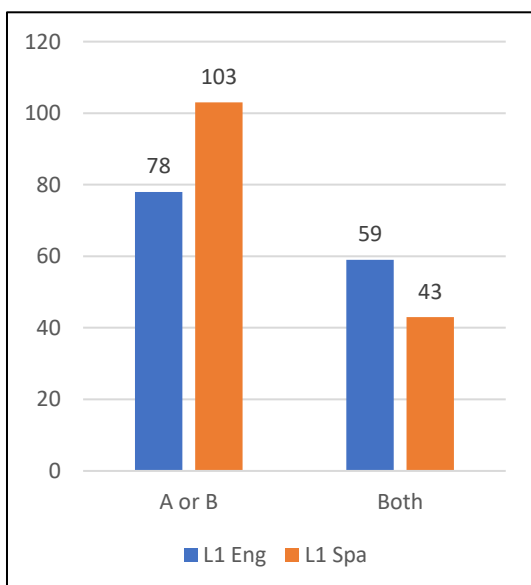
Experiment 2: Chart of 'decisiveness' of native English speakers (L1 Eng) versus native Spanish speakers (L1 Spa).

Consequences of bilingualism and L2 exposure type for the processing of filler-gap dependencies: Data from English-Afrikaans bilinguals

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A number of studies have found differences in second language (L2) and first language (L1) syntactic processing. For example, Marinis et al.'s (2005) self-paced reading task testing subjects' processing of long-distance *wh*-dependencies in English finds differences in the L1 and L2 processing of filler-gap dependencies. The authors attribute this result to an "L2 effect" on processing, which posits that it is the L2 status of the language that causes the observed dissimilarities.

One issue with this conclusion is that the bilinguals tested had spent limited time in the L2 setting, leading to limited L2 exposure and use. Pliatsikas and Marinis' (2013) replication of Marinis et al.'s study addresses the possible impact of type of L2 exposure. They find similar processing behavior in L1 speakers and in L2 speakers who had received naturalistic exposure to the L2. These groups' results differed from those of the L2 group who had received only classroom exposure.

This paper reports on another replication of Marinis et al.'s (2005) study. The study's first contribution is that it tested proficient L2 speakers who have spent all their lives in a context where L2 exposure is pervasive. Its second contribution is its use of an L1 control group of bilinguals with comparable levels of L2 proficiency and exposure. The possible effect of the L2 speakers' bilingualism on their processing behavior is thus controlled for.

Participants were 45 English-Afrikaans bilingual students at a university in South Africa's Western Cape (28 L1 English-L2 Afrikaans; 17 L1 Afrikaans-L2 English). The results show no main effect of L1 group on the participants' processing behavior, thus suggesting that the differences previously observed may indeed be due to a bilingualism and/or exposure type effect. Consequences for research into bilingual processing are discussed.

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Speech rate effects on the processing of non-native conversational speech

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One core characteristic of spontaneous conversational speech is its variation in speech rate, where faster speech often results in reductions and elisions (e.g., Mattys et al., 2012). Fast speech rates increase word recognition times, as reflected e.g. by longer reaction times, relative to more habitual rates in native adults (= speech rate effect; e.g., Koch & Janse, 2016; Janse, 2009). Word recognition in conversational speech is especially taxing for non-natives because they are less familiar with less canonical token variants than native listeners. This study aimed to test for a potential interaction of language proficiency and speech rate effect in the processing of naturally produced conversational speech. We hypothesized that compared to native listeners, low proficiency language learners would be more adversely affected by faster speech rates, whereas highly proficient learners would be affected to a similar degree as natives. We tested 44 German natives (mean 23.3 yrs.) with varying L2 proficiency in Dutch, and a control group of 32 Dutch natives (mean 22.7 yrs.), who listened to 60 Dutch question-answer pairs taken from the corpus of spoken Dutch (Oostdijk, 2000). Their task was to click a target word that was presented on screen together with three competitors as soon as they heard that word in an auditorily presented mini dialogue. As expected, click response times measured from target word offset increased with decreasing L2 proficiency and with increasing speech rate. The solid language proficiency effect is especially noteworthy as German and Dutch present closely related languages. Notably, language proficiency was differentially affected by speech rate. The speech rate effect was mainly modulated by individuals' vocabulary knowledge and processing speed.

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Processing L2 intonation contours and exhaustivity: A mouse-tracking study

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In English [1] and German [2], sentences with L+H* and H* intonation contours have been shown to differ in their exhaustivity interpretation: L+H* contours show a preference for an exhaustive interpretation as compared to the more underspecified H* contours. Studies on L2 acquisition have shown that the processing of intonation even in two very similar intonation systems is not fully parallel [4]. We therefore ask (i) whether German listeners of L2 English are sensitive to the small phonological or phonetic differences in the English intonation contours and (ii) whether these non-native listeners would consider lexically unmentioned alternatives in the non-exhaustive interpretations similar to native listeners. Our mouse tracking study partially follows the experimental design of [2], manipulating the factors proficiency (native vs. non-native), intonation (L+H* vs. H*), and exhaustivity (control vs. critical). Mouse movements were recorded as an indicator of which visual alternatives listeners consider and process while hearing a sentence like "*Mary has a CANDLE on the table/shelf*" (cf. Figure 1). Whereas the control conditions (cf. left panel in Figure 1) are exhaustive when comparing lexical (auditory) and visual stimuli, the critical conditions (cf. right panel in Figure 1) are not, which has been shown to lead to a garden-path effect in English native listeners, which is stronger for L+H* contours [2]. The standardized LexTale [3] was used to quantify L2 proficiency. Word-picture agreement scores served as an additional item-related measure. Data acquisition from 40 German L2 speakers of English and 40 native speakers of American English is currently under way. We expect to find main effects of L2 proficiency, exhaustivity, and intonation contour. While we expect non-natives to correctly perceive and react to the visual and auditory stimuli, their mouse trajectories are expected to show differences in the strength of garden-path effects compared to native listeners.

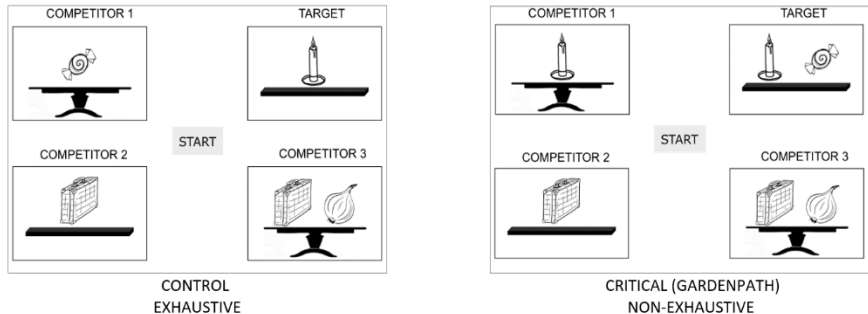🔊 Mary has a CANDLE($^{H*/\ L+H*}$) on the shelf.

Figure 1: Example visual stimuli presented together with the example auditory stimulus "Mary has a CANdle on the shelf". Left panel: Control conditions, in which auditory stimulus and visual target are compatible in terms of exhaustivity for both intonation contours. Right panel: Critical garden-path conditions, in which the auditory target with L+H* favors an exhaustive interpretation which is not compatible with the visual target.

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Aspectual tense choice in native and L2 English: The effect of priming

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Property: Language users have a choice of aspectual tenses when describing ongoing events. In English, the present progressive (1b) is typically used to denote an ongoing activity simultaneous with speech. The present simple use (1c) is highly marked, e.g., in oral commentaries. This contrasts with French, where the *présent* (2b) and the progressive periphrasis (2c) can be used interchangeably. Thus, the forms are not exactly aligned.

Hypothesis: Based on the view that syntactic representations could be shared across a multilingual's languages (Schoonbaert, Hartsuiker & Pickering, 2007), we hypothesise that L1 and L2 speakers' choice of aspectual tense morphology will be influenced by a previously mentioned aspectual tense. In addition, since the tenses are not aligned perfectly, we expect an L1 transfer effect.

Experiment: We draw on findings from two experimental studies: Liszka (2009, Experiment 1), and our partial replication of that study, Experiment 2. In both studies, participants were asked to describe the events in a 9-minute video clip from the TV series *The Return of Mr Bean* while the video was playing (see instructions in appendix). Respondent data was recorded and transcribed. Participants were high-intermediate/advanced L2 learners of English with L1 French and a control group of English native speakers.

Results: Results (see Figure 1) show learners are as sensitive to the effects of aspectual tense priming as native speakers, albeit to different degrees. L1 speakers' choices suggests that, when not primed, L1 speakers license both aspectual tenses in ongoing contexts. L2 speakers also chose the present simple significantly more in Experiment 1. These choices were considered an error in Experiment 1; Experiment 2 shows they may not have been.

Conclusion: Both L1 and L2 speakers demonstrated sensitivity to structural priming; in addition, learners were influenced by their

native language. Shared syntax and syntax–semantics mismatch explanations will be discussed.

Examples:
(1) a. She **works** at home on Mondays. (habitual activity)
   b. She **is working** at home (right now). (ongoing OR delimited, temporary activity)
   c. He **runs** with the ball, he **scores**! (ongoing activity, MARKED)

(2) a. Elle **travaille** à la maison tous les jours. (habitual activity)
      She works at home every day.
   b. Elle **travaille** à la maison en ce moment. (ongoing activity)
      She is working at home at the moment.
   c. Elle est **en train de travailler** en ce moment. (ongoing activity)
      She is working at home at the moment.

<u>Instructions:</u>
Experiment 1 (incl. of syntactic priming): You are going to watch a TV programme and I would like you to describe what is happening on the screen at the same time as you are watching.
Experiment 2 (excl. of syntactic priming): Describe the events orally at the same time as the video.
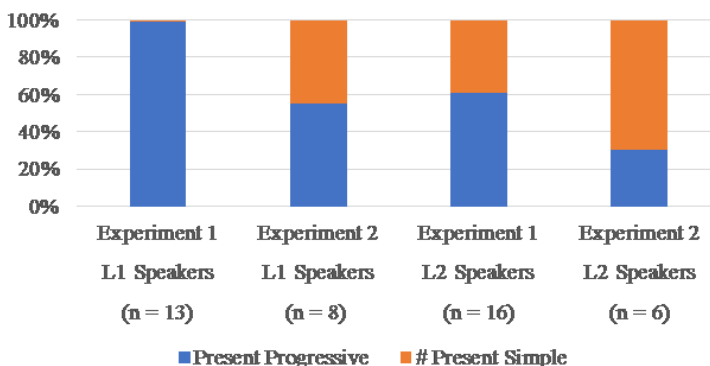
Figure 1: Aspectual Tense Choices in Description of Ongoing Events
Note: Testing is ongoing in Experiment 2

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L2 parafoveal processing (or lack thereof)

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While native speakers use information rapidly during processing to anticipate upcoming sentence content, L2 speakers do so less efficiently. Previous explanations for this difference include factors like frequency and lexical representation [1], as well as reduced ability of L2 speakers to generate expectations [2]. However, we hypothesize that these differences may (in part) be explained by the reduced perceptual span (the area outside of the highest level of visual acuity) of L2 speakers [3]. Research has shown a L1 benefit when previewing frequent and expected words in the perceptual span while reading [4].

We used an eye-tracking boundary paradigm to test the use of expectation and frequency information in the perceptual span during reading in L1 and L2 speakers of English. The critical words were manipulated in a 2x2x2 design: frequency (high(HF)/low(LF)), expectation (high(HE)/low(LE)), and masking (unmasked/masked). For the masked condition, the critical word was masked with a non-word in the perceptual span and changed to the critical word upon making a saccade across an invisible boundary. Critical words were controlled for frequency, syllable count, stress, and length, and their expectation was judged by 84 native English speakers.

Two groups were tested: native English speakers (n=21) and L2 English speakers (n=20). In terms of first fixation duration (FFD) we found an interaction between masking, frequency, and language (Figure 1) that revealed that the L2 group did not differ between masked and unmasked conditions, while the L1 group had a greater FFD for masked compared to unmasked conditions. Additionally, the L1 group had a greater FFD for HF-masked than the L2. This suggests L2 speakers are unaffected when parafoveal information is denied, while L1 speakers show longer reading times. What appears to be reduced involvement of prediction and expectation by L2 speakers may actually be a Decreased Ability to Preprocess Information during reading, or DAPI.
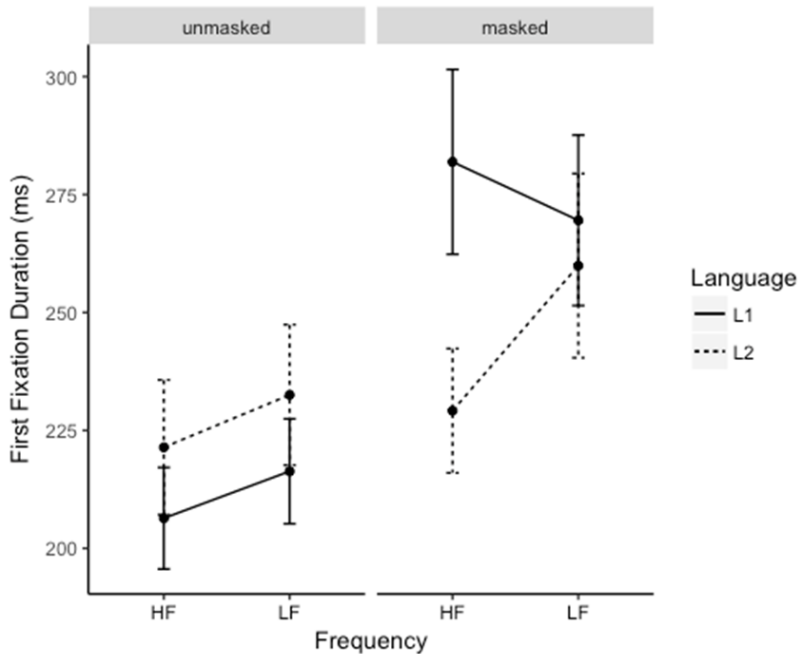
Figure 1: First Fixation Duration masking, language, and frequency interaction

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Sensitivity to language statistics in first and second language reading

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Proficient language comprehension is highly sensitive to that language's statistical patterns. For example, the time spent reading a word is linearly related to its *surprisal*; the negative logarithm of the word's probability given the sentence so far (Smith & Levy, 2013). We investigated whether the use of internalized language statistics differs between mono- and bilinguals and between first and second language reading. We compared word-reading times between two groups of native English speakers (monolinguals (N=21) and bilinguals (N=19), mostly heritage speakers) and proficient non-natives with L1 either Dutch (N=20) or British Sign Language (BSL; N=9). Reading times (RTs) were measured using eye-tracking on 205 English sentences (1931 word tokens) sampled from novels to be representative of the written language (Frank et al., 2013). Word surprisal values were computed by n-gram models (n=2,…,5) that estimate word probability from frequencies of word sequences (up to length n) in a English text corpus. Goodness-of-fit of first-pass RTs to surprisal was quantified by linear mixed-effects regression, including a predictor for previous word surprisal to capture spillover, and predictors for word frequency and length (among others) as covariates.

In all groups, larger n leads to a better fit, indicating veridical knowledge and use of frequencies of longer word sequences (Figure 1). Native Dutch speakers show weaker spillover than the other groups, possibly because reading is less fluent for the non-dominant written language. Surprisal predicts monolinguals' RTs more accurately than those of the other three groups, which all show similar goodness-of-fit (Figure 2). Comparisons between groups using 100-sample bootstrapping (for n=5) confirmed that the only significant difference is between monolinguals and the other groups. This suggests that the relation between RTs and a language's

statistical properties is weakened by knowledge of any other language, even if it is the L2 or (like BSL) has no orthography.
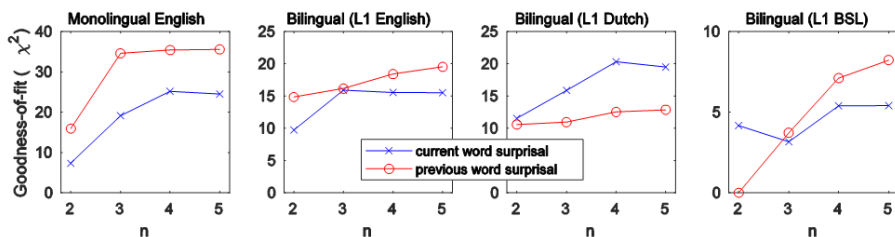

Figure 1: Goodness-of-fit of surprisal to RTs, as a function of the maximum word-string length (n) for surprisal computation ($\chi 2 > 3.84$ corresponds to $p < .05$). Each point is the outcome of a log-likelihood ratio test comparing a regression model that includes both current and previous word surprisal, to a regression model that includes only one of the two. That is, the plotted fit of current word surprisal is over and above previous word surprisal, and vice versa. Note that $\chi 2$ cannot be compared between groups because the data sets have different sizes.
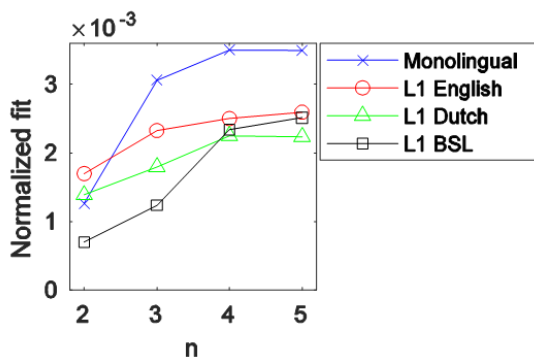
Figure 2: Goodness-of-fit of current and previous word surprisal *combined*, after correcting for differences in data set size between groups ($\chi 2$ divided by number of data points).

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Smith, N. J., & Levy, R. (2013). The effect of word predictability on reading time is logarithmic. *Cognition*, *128*, 302–319. https://doi.org/10.1016/j.cognition.2013.02.013

Lingering misinterpretation of non-local dependencies in non-native comprehension

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Non-native (L2) speakers misinterpret garden-path sentences requiring reanalysis like (1) more often than native (L1) speakers [1,2]. Reanalysis also occurs in non-local dependencies like (2a), where 'the car' may temporarily be interpreted as the theme of 'stopped', but how this affects L2 comprehension is unkown. To explore this issue, we conducted two experiments with 40 intermediate-advanced English L2ers and 40 L1ers.

In Experiment 1 (Ex1), participants read 24 ambiguous (2a) and unambiguous (2b) sentences, and answered questions like (3). If initially-assigned interpretations linger [3], accuracy rates should be lower for ambiguous sentences. In Experiment 2 (Ex2), participants read 24 ambiguous (3a/3c) and unambiguous (3b/3d) sentences while their eye-movements were monitored. In (3a/3b), the second continuation sentence was consistent with the correct analysis of the first sentence ('the maid was cleaning the floor'). The continuation in (3c/3d) is inconsistent with this correct analysis but is consistent with the initial misinterpretation ('the maid was cleaning the brush'). If initial misinterpretations linger, reading times may become longer in (3a) than (3b) and shorter in (3c) than (3d) as the misinterpretation reverses (in)consistency effects in ambiguous conditions.

Accuracy rates were significantly lower for ambiguous sentences in Ex1, and reading times for the first sentence in Ex2 significantly longer for ambiguous sentences at the disambiguating noun ('the floor'), showing filled-gap effects [4]. There were significant interactions in the continuation sentence, with longer reading times in (3a) than (3b) at the critical region ('the floor') and shorter reading times in (3c) than (3d) at the spillover region ('while thinking'). No effects significantly interacted with group in either experiment.

These results suggest lingering misinterpretation in non-local dependencies in L1ers and L2ers. As in garden-path sentences [3],

this difficulty for both L1/L2ers relates to difficulty erasing this misinterpretation from memory, rather than inability to construct the correct structure.

(1)   While Anna dressed the baby played in the bedroom.

(2a)   John saw the car which the officer stopped the bicycle near earlier today.
(2b)   John saw the car near which the officer stopped the bicycle earlier today.

(3)   What did the officer stop? 1. The car 2. The bicycle

(4a)   The child noticed the brush which the maid was cleaning the floor with very carefully.
(4b)   The child noticed the brush with which the maid was cleaning the floor very carefully.
(4c)   The child noticed the brush which the maid was cleaning the floor with very carefully.
(4d)   The child noticed the brush with which the maid was cleaning the floor very carefully.
Final sentence (4a-d): It seemed that the maid was cleaning the brush while thinking about dinner.
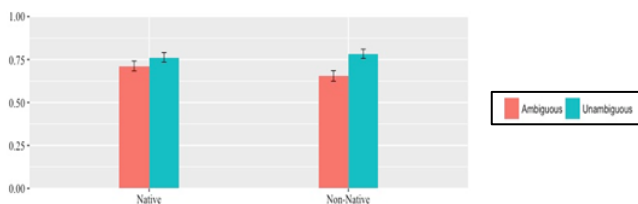

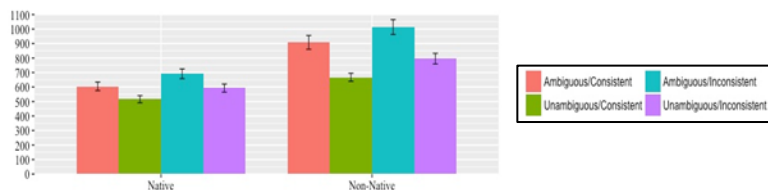**Figure 1**: Proportion of correct responses.

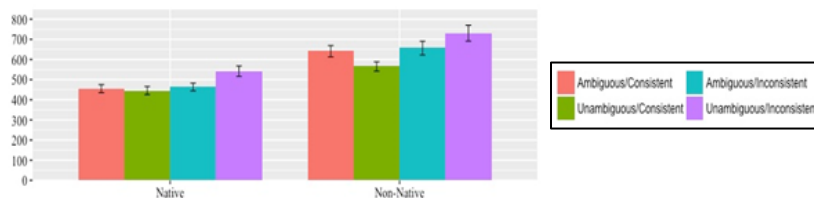**Figure 2:** Total viewing times at the disambiguating noun.

Figure 3: Total viewing times at the spillover region.

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Predictive processing of gender in L1/L2 Welsh

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The role of prediction in the processing of gender in second language acquisition has garnered increasing interest in recent years (Grüter et al, 2012; Hopp, 2016). While the same system is thought to underscore both L1 and L2 gender processing, the latter is more cognitively demanding and subject to greater working memory effects (Cunnings, 2016; Sagarra & Herschensohn, 2010). Much previous work on predictive gender processing has concentrated on languages such as French, German and Spanish – all of which clearly mark gender on the determiner. To date, there has been a lack of investigation into languages with more complex gender systems, such as Welsh. Welsh has a binary gender system that is mainly viewed post-nominally through adjectival agreement and consonant-initial mutations. However, it is possible to test gender predictively through the use of cardinal numbers, as the numbers 2, 3, & 4 all have both masculine and feminine forms, e.g:

  (1) Dau gar (two-MASC car/cars-MASC)
  (2) Dwy bont (two-FEM bridge/bridges-FEM)

As Wales is a bilingual country with extensive influence from [-gender] English, our research questions are:

  1. Do Welsh-English bilinguals make use of grammatical gender information in Welsh?
  2. Does working memory affect the processing of gender in Welsh-English bilinguals?
  3. How does language dominance/proficiency affect the processing of gender?

Twenty participants will be divided into two groups based on whether they consider Welsh to be their first or second language. A battery of tasks will be administered including the Bilingual Language Profile, cloze tests in English and Welsh, a visual-world eye-tracking task, an elicited oral production measure, and the TMT Parts A & B as

a measure of attention and central executive control (Salthouse, 2011). This study is a work-in-progress and our initial results will be presented.

The effects of L1 re-immersion on Italian anaphora resolution in an L2 environment

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We investigate whether adult native speakers of Italian who left Italy after puberty and lived in Sweden for at least seven years (late bilinguals) display effects of L1 attrition, and whether they show recovery effects after a re-immersion to Italian, during their summer holidays. We also tested a control group of adult native speakers of Italian living in their home country (monolinguals). The re-immersion allows us to test the hypothesis that L1 attrition is a selective process that affects interface structures and that pertains to processing and language co-activation rather than to changes in grammatical knowledge (Chamorro, Sorace & Sturt, 2015; Sorace, 2011). Following this hypothesis, we expect the group of late bilinguals to perform better after L1 re-immersion, suggesting that attrition is caused by restricted L1 input and to activation mechanisms (Paradis, 1993) rather than to permanent changes in L1 grammatical knowledge. Moreover, we expect that late bilinguals display attrition effects when asked to identify the antecedent of an overt pronoun, due to influence of L2 Swedish. We follow the "Position of Antecedent Strategy" (Carminati, 2002), which postulates that Italian null pronouns are generally assigned to the antecedent in the highest SpecIP, and overt pronouns to an antecedent in a lower syntactic position. The difference between the two groups in the antecedent assignment was significant for overt pronouns: late bilinguals assign overt pronouns to the object of the main clause less often (83%) than monolinguals (91%). After L1 re-immersion late bilinguals show an improvement in terms of expected answers, reaction and reading times while in monolinguals this change is asymmetrical. These results suggest that L1 attrition pertains to language co-activation and processing rather than to changes in grammatical knowledge.

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How prosody affects L2 processing: Pronoun interpretation in L2 Italian

Heather Goad[1], Lydia White[1], Nátalia Brambatti Guzzo[1], Guiherme Garcia[2], Sepideh Mortazavinia[1], Liz Smeets[1] & Jiajia Su[1]

[1]McGill University, [2]Ball State University

In Italian, null pronouns are preferred when the antecedent is subject of a higher clause; otherwise, overt pronouns are preferred (see (1)). Carminati (2002) attributes this to a processing strategy, the Position of Antecedent Strategy (PAS). Sorace and Filiaci (2006) and Belletti et al. (2007) report that L2ers, unlike native speakers (NSs), overuse overt pronouns in contexts where null pronouns are appropriate, attributing this to processing problems relating to the PAS. They further report that NSs and L2ers allow null pronouns to take non-subject antecedents about 50% of the time, unexpected on the PAS.

We hypothesize that prosody influences pronoun choice, both for NSs and L2ers, affecting operation of the PAS. Prior research used written stimuli, making it impossible to assess prosody effects. Our experiment included 78 aurally-presented biclausal sentences, preceded by written contexts to introduce external referents. Presence/absence of pause between clauses and presence/absence of contrastive stress on overt pronouns were manipulated. Participants had to indicate the referent for the pronoun (see (2)). 15 intermediate and advanced L2ers (Dutch and English L1s) and 20 NSs have been tested so far.

Overall, results on null and overt pronouns mirror (in fact surpass) previous research. Both NSs and L2ers showed significant differences depending on pronoun type ($ps<0.001$), preferring subject antecedents for null pronouns and objects for overt (see Fig. 1). As far as overt pronouns are concerned, there were significant differences depending on stress ($ps<0.001$): contrastive stress decreased object choices by all groups, increased selection of external referents by both L2 groups, increased selection of subject antecedents for NSs, and reduced intermediates' inappropriate choice of subject antecedents (Fig. 2). Contrary to expectation,

presence of pause had no effects. In conclusion, the PAS alone cannot explain the determination of antecedents for pronouns by NSs and L2ers: prosodic factors must also be considered.

(1) Lorenzo$_i$ ha scritto a Roberto$_j$ quando Ø$_i$/lui$_j$ si è trasferito a Torino.
   'Lorenzo wrote to Roberto when (he) moved to Turin.'

(2) Example of test item:
Written context (on screen): Bernardo, Corrado e Francesco sono amici.
                             (*Bernardo, Corrado and Francesco are friends*.)
Test sentence (audio):   Bernardo ha scritto a Corrado dopo che lui si è trasferito a Torino.
                             (*Bernardo wrote to Corrado after he moved to Turin.*)
Question (on screen):   Chi si è trasferito a Torino?
                             (*Who moved to Turin?*)
Choices (on screen):   Bernardo, Corrado, Francesco
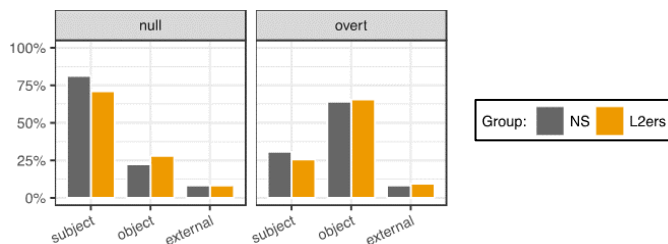
Figure 1: Null vs. overt pronouns: NSs vs. L2ers (collapsed)
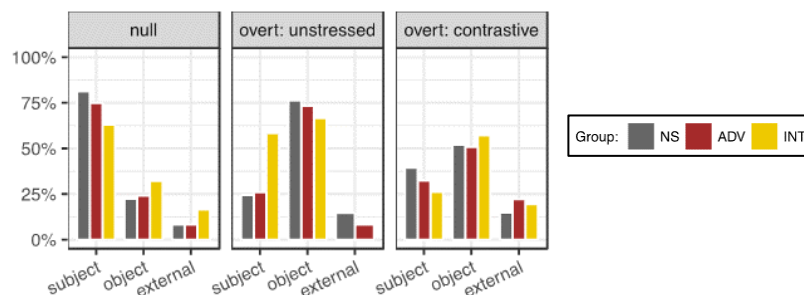
Figure 2: Unstressed vs. contrastively stressed pronouns: NSs vs. two groups of learners

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A *boat* in a *boot*: Cognate effects during interlingual homograph translation

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Radboud University

Translation is a complex process as it requires comprehension in one language and subsequent production of the translation equivalent in the other language. The aim of the current study was to gain more insight in the selection processes during word translation. We conducted a translation production task in proficient Dutch-English bilinguals. We included cognates (e.g., *beaver-bever*), interlingual homographs (IHs, e.g., *room-kamer*, the Dutch word *room* translates to *cream*), words that are a combination of cognates and IHs (e.g., *angel-engel*, the Dutch word *angel* translates to *sting*), and IHs with the other reading being a cognate (e.g., *boot-laars*, but the Dutch word *boot* translates to *boat*). The materials were distributed across two blocks, one for each translation direction. We replicated the IH interference effect, (i.e., slower translations and more errors for IHs than control words), and showed that the cognate facilitation effect (i.e., faster translations and higher accuracy for cognates than control words) is similar in IHs and non-IHs. 'Hidden cognate' IHs (e.g., *boot-laars*) elicited more errors than normal IHs (e.g., *room-kamer*), but reaction times did not differ. Furthermore, translations from English to Dutch were slower and elicited more errors in the second block when the English reading had to be inhibited in the first block. Our findings are in line with the idea that the irrelevant reading of the IHs is inhibited and suggest that the word selection is made at the semantic level. We suggest that effects of translation direction and block order are due to sustained inhibition of the irrelevant language.
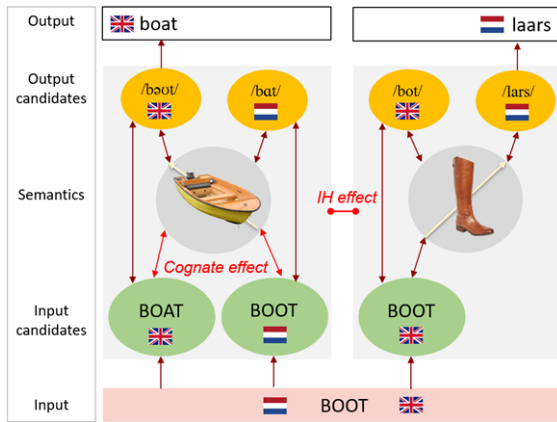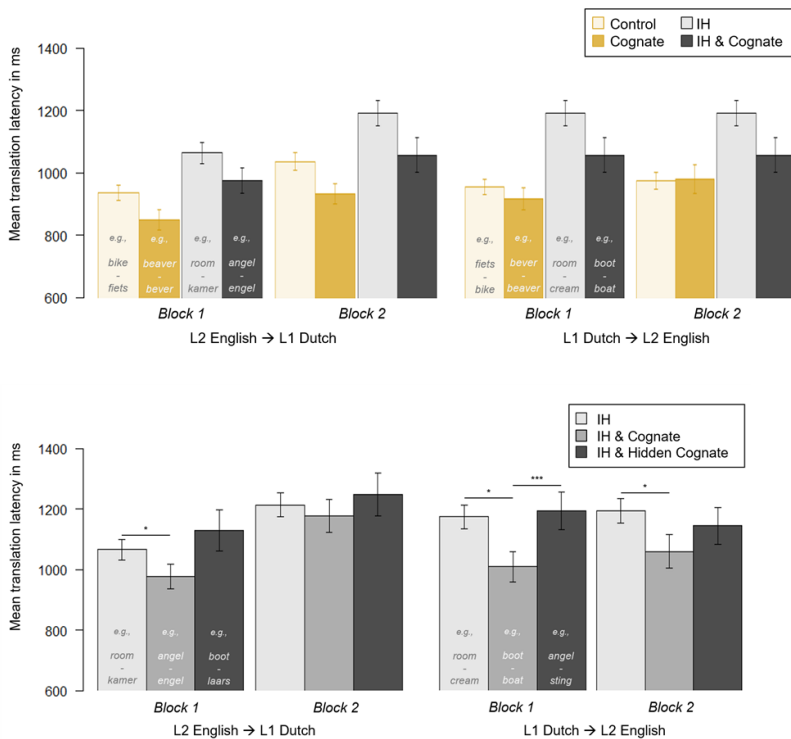
Figure 1. Examples of the translation process of an Interlingual Homograph/Cognate combination (left side, Dutch *boot* to English *boat*) and a 'Hidden Cognate' Interlingual Homograph (right side, English *boot* to Dutch *laars*)

Are Dutch children able to distinguish between English phonetic contrasts? A comparison between monolingual children, early-English pupils, and bilinguals

Claire Goriot, Mirjam Broersma, Roeland van Hout, Sharon Unsworth & James M. McQueen

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Previous research showed that native Dutch speakers have a hard time distinguishing between certain English phonetic contrasts (Cutler, Weber, Smits, & Cooper, 2004). In this study we investigated whether primary-school pupils who receive English lessons from kindergarten onwards (early-English education) are able to perceive differences between such phonetic contrasts. We compared 73 early-English pupils to 54 pupils from regular Dutch schools in which English lessons start in the penultimate grade, and to 52 Dutch-English children growing up bilingually at home. We included three different age groups: 4-5 year-olds (n = 66; kindergarten), 8-9 year-olds (n = 52), and 11-12 year-olds (n = 61; final grade). Children performed an XAB-task in which they were presented with non-word minimal pairs. We included four contrasts (/b-s/ [easy control]; /g-k/; /θ-f/; /æ-ɛ/). ANOVAs with Age Group, Bilingual Category (control, early-English, bilingual) and the interaction between these two variables showed an interaction effect on the /æ-ɛ/ contrast. Main effects of Age Group and Bilingual Category were observed for all contrasts but /æ-ɛ/, and /b-s/, respectively (see Table 1). Bonferroni post-hoc tests revealed that 4-5 year-olds were outperformed by older pupils on the /b-s/, /g-k/, and /θ-f/ contrasts. The 8-9 year-olds were outperformed by the 11-12 year-olds on the /g-k/ contrast. Bilinguals performed better than control and early-English pupils on the /g-k/ and /θ-f/ contrasts. Control and early-English pupils did not differ from each other. On the /æ-ɛ/ contrast, 8-9 and 11-12 year-old bilinguals performed better than their peers from control and early-English schools, but no such difference appeared in the youngest age group (Figure 1). This study shows that early-English education does not foster benefits in the perception of English phonetic contrasts. It raises the question

whether age of acquisition and/or amount of input are crucial factors contributing to the bilinguals' advantageous performance.

Table 1: Differences between pupils from different age groups and bilingual categories in performance on English phonemic contrasts.

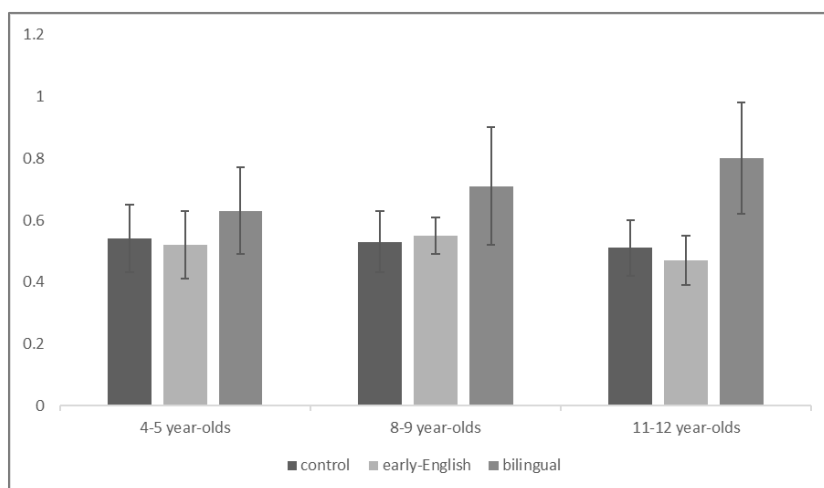|	/b/-/s/	/g/-/k/	/f/-/TH/	/e/-/ae/
Age Group	$F(2,170) =$ 90.85***	$F(2,170) =$ 60.52***	$F(2,170) =$ 9.42***	$F(2,170) =$ 2.17
Bilingual Category	$F(2,170) =$ 2.85	$F(2,170) =$ 19.74***	$F(2,170) =$ 4.81**	$F(2,170) =$ 42.49***
Age Group× Bilingual Category	$F(4,170) =$ 1.39	$F(4,170) =$ 1.72	$F(4,170) =$ 1.25	$F(4,170) =$ 5.46***
R^2	.536	.491	.130	.380

***p < .001; **p < .01

Figure 1: Control pupils', early-English pupils' and bilingual pupils' average proportion correct on the /æ-ɛ/ contrast.

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The processing of English-Turkish (false) cognates: What is the role of morphology?

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Words that have similar orthographic and/or phonological properties in two languages but little or no semantic similarity (e.g., German *Tag* - day vs. English *tag*) are known as *false cognates*. Although there have been numerous studies investigating the processing of (false) cognates, the effect of morphology has to date been largely ignored (cf. Janke & Kolokonte, 2015). Moreover, studies on the processing of (false) cognates have mostly focused on typologically-related language pairs like English-German, disregarding the processing of (false) cognates from typologically distant language pairs.

In the present study, we investigated the processing of English-Turkish real and false cognate word pairs and examined the potential role of the morphological properties of the stimuli. 50 L1 Turkish learners of L2 English participated in a self-paced backward lexical translation task (Janke & Kolokonte, 2015), in which they had to provide Turkish translations for English words appearing on a computer screen. The experiment employed Turkish-English word pairs in 6 different conditions:

1. False Cognate Simplex: monomorphemic false cognates (Turkish *pasta* – cake vs. English *pasta*)
2. False Cognate Mismatch: false cognates; monomorphemic in Turkish but polymorphemic in English (Turkish *izolasyon* – insulation vs. English *isolation*)
3. Real Cognate Simplex: monomorphemic real cognates (Turkish and English *limit*)
4. Real Cognate Mismatch: real cognates; monomorphemic in Turkish but polymorphemic in English (Turkish *lider* vs. English *leader*)
5. Control Simplex: non-cognate, monomorphemic equivalents (Turkish *zehir* vs. English *poison*)

6. Control Mismatch: non-cognate equivalents; mono-morphemic in Turkish but polymorphemic in English (Turkish *istisna* vs. English *exception*)

The results revealed a significant cognate facilitation effect and a significant false cognate inhibition effect. Moreover, it was found that morphological mismatch played a significant role in the processing of cognates and false cognates, which was evident in longer reaction times to mismatch items compared to simplex items.

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Social effects on code-switching: An ERP study

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Research on event-related brain potentials (ERPs) of bilinguals processing sentences with code-switches found that code-switches elicit a negativity over left fronto-central sites, and a posterior and frontal positivity (e.g., Moreno et al., 2002). However most of this research ignores the fact that code-switching is a social phenomenon, and is only licensed in contexts where all conversation partners are bilingual.

The aim of the current study is to investigate whether a bilingual processes a code-switch differently in the presence of a monolingual than a bilingual. We test Spanish-English bilinguals in an ERP reading task in the presence of an English monolingual confederate in one half of the session, and in the presence of a test Spanish-English bilingual confederate in the other half (cf. Rueschemeyer, 2014 for a similar paradigm related to semantic processing rather than codeswitching). Participants read English and English-Spanish sentences (see Table 1) silently while their EEG is recorded. The order of the type of confederates is counterbalanced, and materials are Latin-Squared over the four conditions (Mono/bilingual confederate x Switch/No-switch).

Our critical comparison is between the ERPs starting from the onset of the code-switch and those to the comparable non-switch word in the English-only condition. We expect to find a larger switching effect for code-switches when the participant is in the presence of a monolingual than in front of a bilingual. Data collection is ongoing, but the data collected thus far suggest that processing code-switches in front of a monolingual elicits a larger posterior positivity than in front of a bilingual (Figure 1). This modulation of the positivity was absent in a control study presenting the same materials, but without confederates present. Should these results hold with more participants, this would suggest that comprehension

of code-switches is sensitive to the language knowledge of others present.

Table 1: Examples of the experimental conditions. The critical word is underscored for purpose of illustration.

Confederate	Type	Example sentence
Monolingual/Bilingual	No Switch	The soccer player scored the winning goal <u>in</u> the last minute of the game.
Monolingual/Bilingual	Switch	The soccer player scored the winning goal <u>en</u> el último minuto del partido.
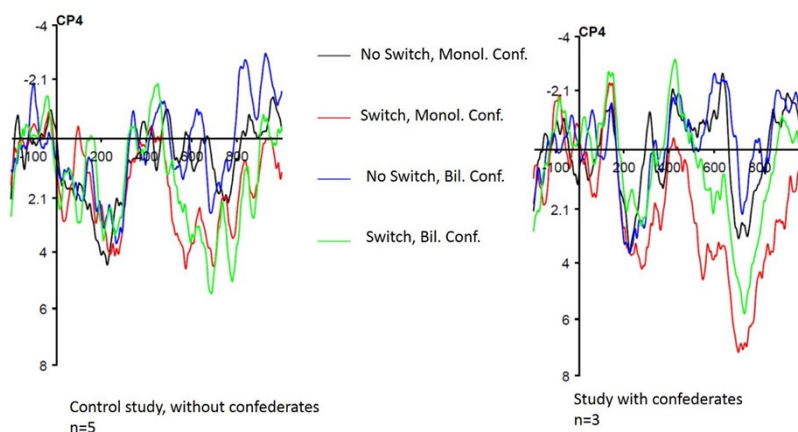
Figure 1: ERP results at the critical word for CPz for the control study (left) and study with confederates (right)

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Rueschemeyer, S., Gardner, T., & Stoner, C. (2014). The Social N400 effect: how the presence of other listeners affects language comprehension. *Psychonomic Bulletin & Review, 22*(1), 128-134. doi:10.3758/s13423-014-0654-x

How do native and non-native grammars affect multilingual pronoun comprehension?

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Previous studies have shown that multilingual speakers are influenced by their native (L1) and non-native (L2) grammars when initially learning an additional language (La) [1,2]. Do these effects extend to more proficient multilinguals during online sentence comprehension? Here we use speeded judgment (Experiment 1) and self-paced reading tasks (Experiment 2) to examine the processing of German possessive pronouns *sein/ihr* ('his/her'; see [3,4] for earlier studies on L2 English). We assess multilinguals' sensitivity to gender mismatches (e.g. *Frau Schmidt küsste ihre/*seine Mutter*; 'Mrs. Schmidt kissed her/*his mother'). The grammatical constraints of possessive pronouns differ cross-linguistically, such that gender agreement with a preceding possessor noun (e.g. *Frau Schmidt*) is required in German and English, but not in Spanish. To investigate whether native and non-native grammars differentially affect multilingual participants' judgments and reading profiles in German, we compare two groups of advanced speakers of La German (matched in their German proficiency and age of acquisition) with inverse L1–L2 distributions: a group with L1 SPANISH–L2 ENGLISH, and a group with L1 ENGLISH–L2 SPANISH. We show that the reading profiles of both groups are modulated by their L1 grammar, while L2 proficiency selectively affects participants' judgment accuracy but not their reading times (Figure 1). These effects show that multilinguals can resort to their L1 knowledge during La reading comprehension, but that L2 knowledge might only be available in situations that encourage the use of conscious linguistic knowledge, such as acceptability judgment tasks. We suggest that this might occur because the procedures available in a L2 grammar are likely to be less automatized and might need to be consciously invoked in order to inform La processing during reading comprehension.
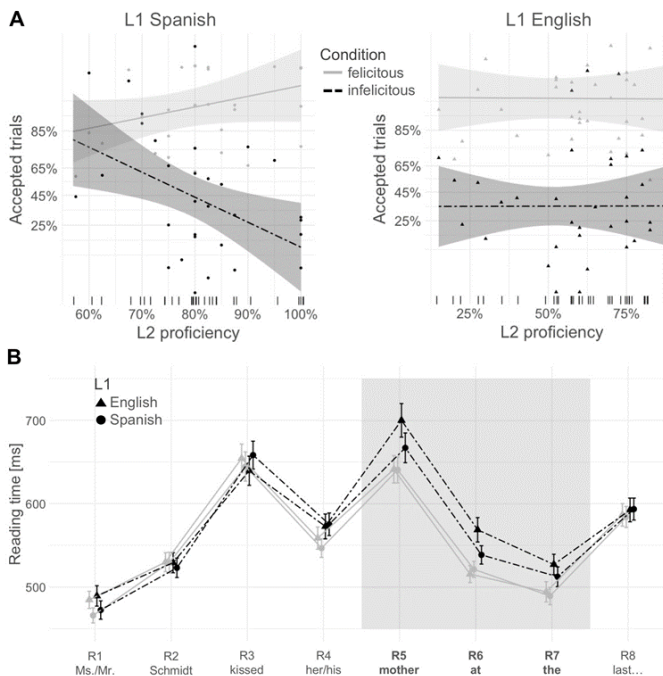
Figure 1. (A) L2 influence in Experiment 1. Participants read sentences with gender (mis)matching possessive pronouns (SOA=500ms p/word) and judged the sentences as acceptable or unacceptable. L2 effects were selective and facilitatory: L1 Spanish participants were less likely to accept infelicitous sentences as their English proficiency increased (a facilitatory effect) whereas L2 proficiency did not modulate the judgments of L1 English speakers. The x-axis shows L2 proficiency ratings on a 0–100% scale, with vertical black bars representing the number of participants at each point of the scale. (B) L1 influence in Experiment 2. Participants read sentences word-by-word and answered comprehension questions. After encountering a gender-mismatching pronoun, L1 English speakers showed stronger reading disruptions than Spanish speakers (post-pronoun regions highlighted in gray), suggesting that they were more sensitive to infelicitous pronouns. Error bars indicate the standard error of the mean. Sample sentence: *Frau/Herr Schmidt küsste ihre/seine Mutter bei dem letzten Familientreffen* ('Ms./Mr. Schmidt kissed her/his mother at the last family reunion').

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An integrated encoding-decoding model of SLA

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Traditionally, comprehension and production processes have been studied separately, based on the assumption that they take place in two separate systems and/or rely on different types of processing operations. This 'two-systems approach' of processing has recently been challenged by proponents of a more integrated view of the processes underlying comprehension and production (see Gambi & Pickering 2018). A key question in SLA research is whether L2 comprehension and production are indeed based on separate mechanisms or whether they are to some extent intertwined. In this paper, I propose an integrated encoding-decoding model of SLA and present evidence from a study of the L2 acquisition of the English passive (Lenzing 2017).

The model combines aspects of *Processability Theory* (Pienemann & Lenzing 2015) with the notion of a *Shared Grammatical Workspace* (Kempen et al. 2012). It assumes the existence of one L2 syntactic processor underlying both grammatical encoding and decoding. I hypothesise that in both encoding and decoding processes, recourse is made to the same processing procedures.

I present data from 59 learners of L2 English with German as L1 at different stages of L2 acquisition. The data were obtained in two related cross-sectional studies focussing on the oral production and comprehension of the passive in relation to each learner's stage of acquisition. The production data were collected using communicative tasks and film clips. The comprehension data were elicited using an enactment task, a sentence-picture matching task and a sentence-matching reaction time experiment.

I analysed the data for a) the individual learners' developmental stages, b) the learners' production and comprehension of the passive and c) differences in reaction times. The results of the study indicate areas of shared resources between comprehension and production processes and suggest that in both modalities syntactic processing is governed by the constraints of the same developmental stage.

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Endpoint preferences in bilingual infants

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Different languages typically prefer different perspectives when producing motion events. A main distinction is between the phasal and the holistic perspectives: The latter is typically characterized by the inclusion of an endpoint, which the former typically lacks.

Linguistic studies have shown that speakers that take the holistic perspective verbalize an endpoint in the description of motion events more often. Eye-tracking studies have found that endpoint preferences affect not only the verbal description of motion events, but also their visual perception and even their memory.

In comparative studies has been shown that even proficient speakers tend to follow the perspective of their native language while talking in the L2. It is assumed that these perspectives are acquired along with the native language. In this study, we look at this phenomenon in the pre-school children's interaction with their parents. The data consists of spontaneous conversations over picture stimuli. All participants were Czech native speakers. Czech prefers a holistic perspective. The data analysis shows that in interviews, the endpoint is verbalized very often, parents even lead the children's attention to this endpoint.

On this poster, we will present these findings about the perspective preferences and introduce the upcoming research with bilingual infants of various ages. The goal is to determine when the preference for endpoint emerges. We plan to compare interactions with very young Czech-German and Czech-English bilingual speakers, since German is a holistic perspective language and English a phasal perspective language. Comparing the perception of motion events from these two groups of speakers will give us insights about how bilingualism influences the perspective taking.

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Multilingual learning in French immersion contexts: Age and socioeconomic factors

Alexandra Marquis[1] & Phaedra Royle[2]

[1]United Arab Emirates University, [2]University of Montreal

Children master different verb-inflection patterns based on default status and reliability [1, 2]. We investigated verb production in French children and adult, monolinguals (L1) and multilinguals (MUL). We hypothesized that L1 and MUL participants would process verb inflection patterns differently [3] based on their default status and reliability [2] due to less exposure to the language [4]. Adult L1 but not MUL speakers were expected to show strongest verb production abilities.

Verbs were elicited in 238 L1 and MUL French speakers: A first group of 162 children (70 MUL) and 36 adults (11 MUL) were in French school or work contexts for one to five years. Children were preschoolers and first-graders from a high SES suburb of Montreal. A second group of 40 children came from a low SES suburb (30 MUL). Twenty-four French verbs with regular, sub-regular, and irregular participles were elicited in the past tense (6 each, ending in –*é* /e/, sub-regular –*i*, third conjugation –*u* /y/, and idiosyncratic forms). Verbs were presented in infinitive and present tenses with an image. Participants were prompted for target verb forms with a question (see example in Figure 1).

Models using logistic regression analyses for target responses in the first group showed no language status effects (L1 = MUL). Group (adults, children), and verb type effects, as well as a significant interaction of these factors, were found (Figure 2). The pattern [é = i = u < idiosyncratic] is observed in adults and children with subtle differences. Age and parental education modulated child results. Contrary to expectations, *all* groups showed strengths on default patterns and sensitivity to sub-regularity. Thus, MUL speakers can master French verb patterns to the same level as L1 speakers in immersive school and work contexts (contra [3]). Further analyses including the low SES group will be presented.
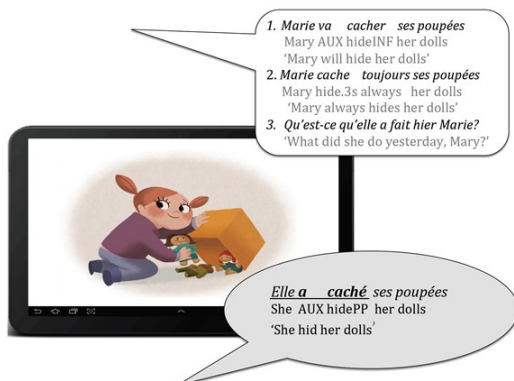
Figure 1: Example of verb elicitation for *cacher* 'to hide' using the *Jeu de Verbes* 'verb game' Android application.
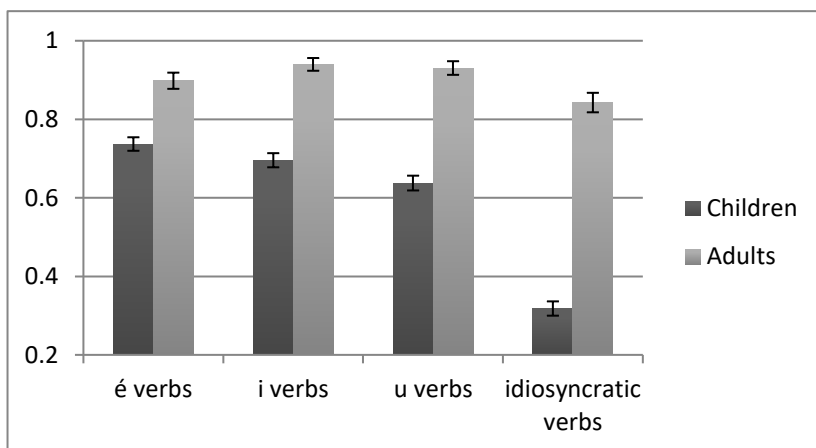
Figure 2: Participant group (adults vs. children) and verb type effects on production of the *passé compose* in French.

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Establishing antecedent reference for L2 reflexive pronouns among L1 Chinese learners of Japanese: An eye tracking study

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This study reports data from an eye tracking experiment measuring the time course in establishing reference for the Japanese reflexive pronoun *zibun* (自分) by highly proficient L2 speakers whose native language is Chinese (JLPT: N1) (*n* = 24). Participants heard stimulus sentences that include three NPs (subject, location, goal/instrument) plus a fourth object NP, either *syasin* 'picture' or *zibun no syasin* 'self's own picture', while viewing an array of four pictures that depict each of the three antecedent NPs plus one distractor item. Subjects then clicked on one of the pictures to answer an auditorily presented follow-up question (Dussias, 2010). Antecedent binding for the Japanese reflexive pronoun may be local or long-distance, but it must be subject oriented (Thomas, 1995). The Chinese reflexive pronoun *zìjǐ* (自己) exhibits the same subject orientation property and variable binding, though Chinese speakers and Japanese speakers may differ in their preferences for local or long-distance antecedents (Yuan, 1998). Thus, whether Chinese speakers rely on native language processing strategies or on target-like L2 strategies when resolving reference for reflexive pronouns in Japanese, they should be able to avoid interference from intervening non-subject NPs, particularly when the target subject antecedent is within a local domain. A control group of Japanese native speakers (*n* = 28) demonstrated anticipatory coreference even before the appearance of the reflexive pronoun in the auditory stimuli. Chinese participants demonstrated accurate association of the reflexive pronoun with subject antecedents promptly upon hearing it in the stimuli, but they did not exhibit the anticipation observed among the Japanese native speakers. The disparity in the time course between L1 and L2

speakers of Japanese is attributed not to differences in the processing of pronominal coreference but to extra-grammatical processing demands associated with decoding speech in one's non-native language.

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An ERP investigation of Spanish scalar implicatures: An L1 attrition study

David Miller[1] & Jason Rothman[1,2]

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The present study examines scalar quantifier interpretation in Spanish. Spanish has two scalar quantifiers that roughly translate to "some" in English, but that distribute uniquely according to the context in which they are used. *Algunos* 'SomeA' gives rise to a quantity implicature and is partitive due to semantic features constraining its meaning. *Unos* 'SomeB' does not give rise to an implicature and can refer to whole sets. We measured ERPs and offline judgments in an attempt to disentangle processing from the erosion of mental representations among Spanish-English bilinguals in long-time L2 immersion. The first experiment assessed offline judgments via a picture-sentence verification task that was also used to collect ERP data. Offline judgments for this task revealed that monolinguals reliably judged *algunos* to be partitive and *unos* to be either partitive or whole. Long-time bilingual Spanish learners of English showed an over-acceptance of *algunos* in reference to whole sets, and showed no preference for *unos* in either subset or whole set contexts, accepting both quantifiers in any context. The ERP responses for monolinguals for this task revealed an N400 for *algunos* whole set contexts compared to subset contexts, as well as an N400 effect for *unos* whole set compared to subset contexts. Monolinguals also showed a post-N400-positivity when comparing algunos conditions that we take to be associated with a strong semantic violation. Bilinguals show no N400 for the *algunos* comparisons and only the emergence of an N400 for the *unos* comparisons. Finally, a non-binary interpretation task showed that the monolinguals judge *algunos* to be partitive and *unos* to be either partitive or whole. Bilinguals over accept *algunos* in whole contexts and largely accept *unos* in either whole or subset contexts. The data suggest that L1 attrition at a truly external interface is not an issue of either just processing or just competence. Both implicit brain responses and

judgments are non-native-like for scalar interpretations among bilinguals, showing evidence of L1 semantic-pragmatic mapping changes after prolonged exposure to a unique L2 with simultaneous decreases to L1 input. We suggest that a fine-grained approach offered by applying the Feature Reassembly Hypothesis to the domain of L1 attrition might be fruitful for thoroughly explaining the present data and for future studies in L1 attrition more generally.
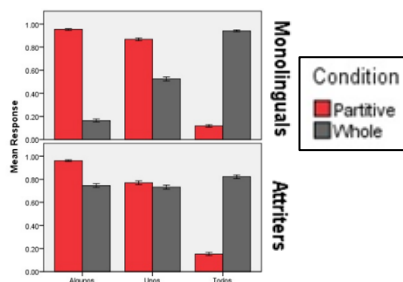
Figure 1: Judgments for picture sentence verification task
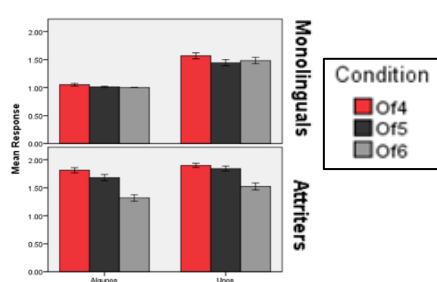

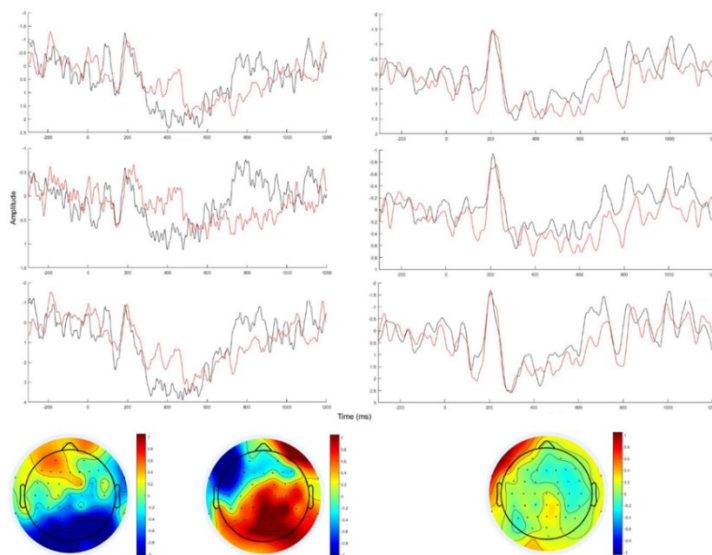**Figure 2**: Judgments for non-binary interpretation task

Figure 3: Grand average ERPs at CPz, Pz and Cz for *algunos* whole compared to *algunos* partitive among controls (left) and attriters(right). Topographical distribution for same condition made by subtracting felicitous from infelicitous conditions between 200-600 ms (in addition to 700-900 ms for controls).

Wholesale vs. property-by-property transfer: Acquisition of morphological case in an artificial L3

Natalia Mitrofanova[1] & Marit Westergaard[1,2]

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The role of previously acquired languages in the acquisition of morphosyntax in a third/further language (L3/L*n*) has been at the core of debates within the field (see González Alonso et al., 2017) and has implications for issues beyond linguistics, such as cognitive economy and non-redundant learning. One of the widely discussed issues is whether linguistic transfer takes place in one fell swoop soon after initial exposure (cf. the Typological Primacy Model, Rothman, 2015) or is selectively sourced from L1 and/or L2 depending on linguistic property-specific similarities (cf. the Linguistic Proximity Model, Westergaard et al., 2017). For proponents of the former position, the source language is selected based on overall structural similarity to the L3, as assessed by the learner's internal parser following a hierarchy of cues, where the lexicon is most salient.

Focusing on the above question, we designed a picture-sentence matching task employing an artificial language as an L3, and two groups of participants: Norwegian-English (n=23) and Russian-Norwegian bilinguals (n=23). The L3 was constructed using Norwegian lexical roots combined with case marking in the manner of Russian. If lexical similarity prompts wholesale transfer from Norwegian for both groups, no difference between these groups is expected. If, on the contrary, case-licensed flexible word order can be selectively supported by any previous language, Russian-Norwegian bilinguals should have an edge.

After a short training phase, where the participants were exposed to grammatical examples of both SVO and OVS sentences, they were asked to decide if sentences accurately described pictures on a screen (see Table 1). Stimuli were grammatical/ungrammatical SVO and grammatical/ungrammatical OVS. Ungrammatical sentences used the wrong case marker (e.g. NOM on the object and ACC on the subject). Results show a higher accuracy in both word orders for the

Russian-Norwegian group, in line with the prediction of property-specific transfer (Fig.1).

Table 1: Experimental design: conditions (A-D) and predictions for the Norwegian-English and Norwegian-Russian groups as predicted by the Typological Primacy Model (TPM) and the Linguistic Proximity Model (LPM)

Picture: A rabbit finding a carrot	Case	WO	NOR-ENG	NOR-RUS (TPM)	NOR-RUS (LPM)
A. Rabbit-NOM finds carrot-ACC	correct	SVO	Accept		
B. Rabbit-ACC finds carrot-NOM	incorrect	SVO	Accept		Reject
C. Carrot-NOM finds rabbit-ACC	incorrect	OVS	Reject		
D. Carrot-ACC finds rabbit-NOM	correct	OVS	Reject		Accept
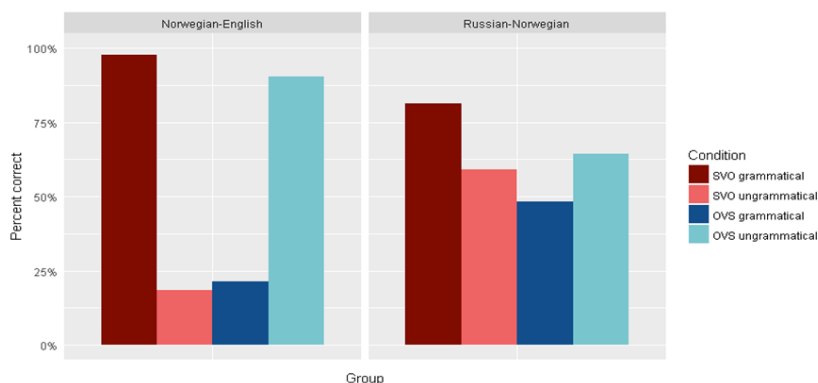
Figure 1. Accuracy rates across conditions for the Norwegian-English and Norwegian-Russian groups.

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Language processing and ambiguity resolution in monolingual and bidialectal ageing

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As the numbers of older people around the world are growing drastically, the effects of ageing on their linguistic and cognitive profile are attracting increasing research interest. Although evidence from research on bilingualism in relation to its protective role against age-related decline is rather extensive and robust (Bialystok et al., 2009; Alladi et al., 2013) much less is known about the possible existence of similar advantages in bidialectalism. Greek, a morphologically rich language, constitutes an excellent candidate for such a research.

Under this rationale, the present study examined the impact of ageing on linguistic processing, as well as the effect of Pontic-Greek bidialectalism on ambiguity resolution. To this aim, we used an on-line self-paced reading paradigm with locally complex structures of Greek that involve a subject/object ambiguity (following Papadopoulou & Tsimpli, 2005). 16 Pontic-Greek bidialectals of older age and a control group of 16 Greek age-matched monolinguals were recruited for the study. Our results showed that bidialectals were faster than monolinguals, providing support for the bidialectal advantage in linguistic processing. Interestingly, when compared to previous findings from young adults, bidialectals exhibited effects similar to young adults for the Determiner and Noun segments. They initially showed a direct-object bias (Late Closure effect), later replaced by a subject preference during the Noun. This finding suggests a rather protective role of their linguistic repertoire to age-related processing declines. On the other hand, monolinguals showed no particular preference during the Determiner readings, but followed the same subject preference upon the Noun. Accuracy of the two groups of older participants did not show any differences from each other, but they both showed lower performance when compared to young adults.
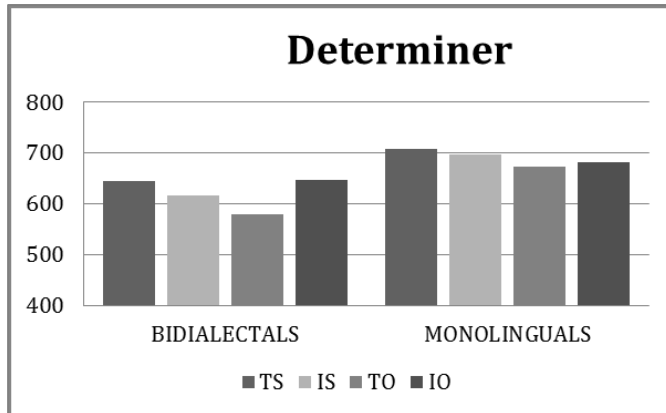
Figure 1: Determiner: Mean RTs per group per condition
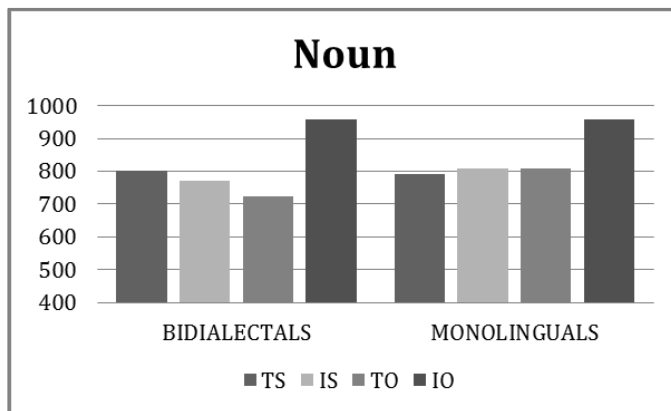
Figure 2: Noun: Mean RTs per group per condition

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The perceptual span of L2 English speakers with different L1 alphabetic systems

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During reading, the eye takes in useful information not only from the characters one fixates on but also from all characters in the 'perceptual span' (i.e. the characters outside the center of the fixation). In English, for example, the perceptual span is approximately 14-15 characters to the right and 3-4 characters to the left of the fixated character [1].

Surprisingly, few studies have assessed the perceptual span of L2 speakers [2,3]. These studies suggest that the perceptual span for L2 readers of English is about 3-4 characters to the left of the fixated character but only 6-8 characters to the right. However, reading skills in one alphabetic system may not transfer directly to reading skills in another system. Therefore, a question arises whether the difference between perceptual span sizes of L1 and L2 speakers can be explained by differences in the alphabetic systems across the L1 and L2.

In this study, we are exploring this question by comparing the L2 English perceptual span of L1 speakers of German with that of L1 Russian speakers. We hypothesize that participants with L1 Russian will have a smaller perceptual span in English than participants with L1 German, given that Russian speakers first learn to read in the Cyrillic alphabet while German participants have always read using the Roman alphabet. Thus, the Russians are likely to experience more cognitive load and less automatization during reading in English than the L1 German group.

To test this hypothesis, we use the gaze-contingent moving window paradigm, in which a window of text moves together with the participants' fixations on the screen while the text outside of a window is masked ([4], see Table 1). We are currently collecting data from participants (20 per group), and expect to have completed the analysis by March 2018.

Table 1: Example stimuli (the * represents the point of fixation)

Window size	Sentence
6	xx xxxxx xxxxxxg a tie durxxx xxx xxxxxxx xxxx. *
8	xx xxxxx xxxxxxg a tie durinx xxx xxxxxx xxxx. *
10	xx xxxxx xxxxxxg a tie during xxx xxxxxx xxxx. *
12	xx xxxxx xxxxxxg a tie during thx xxxxxx xxxx. *
14	xx xxxxx xxxxxxg a tie during the xxxxxx xxxx. *
No window	He hates wearing a tie during the summer heat. *

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Anticipatory eye movements in L2 *wh*-movement

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In this study, we conducted an eye tracking experiment using the visual world paradigm (VWP) to examine how speech rate and working memory capacity influence (n=21) German L2 English speaker's ability to anticipate an upcoming object in a *wh*-question (e.g. *Who$_i$ did the boy kiss t$_i$ at school)*. Working memory (WM) may be important for language given that WM allows for short-term connections between objects by linguistic and visuospatial representations [1]. Previous research using the VWP suggests that the input rate of speech affects people's ability to anticipate gaps in *wh*-questions and we therefore varied the speed of the auditory input [2,3].

Individual differences in WM capacity and L2 proficiency were examined by averaging participant's scores on their performance in 3 complex span tasks (e.g., operation span, symmetry span and rotation span) allowing for the assessment of a dynamic WM process which involves both processing and storage capacity [4]. We predicted that L2 low spanners would be slower at shifting their attention to the relevant object in the display compared to high spanners.

Target-advantage scores were examined 200ms following the verb. We looked at target-advantage scores (target minus competitor, where a positive advantage showed participant's preference for the object over the subject) during the *wh*-movement question and comprehension accuracy using general linear mixed models in a 2x4 factorial design: WM (high/low) x speech rate (3.5, 4.5, 5.5, 6 syllables per second). Preliminary results show no significant effect of input rate or WM ($p > .05$). In terms of accuracy there was an interaction between WM and speech rate with differences between the WM groups occurring at the 4.5 and 5,5 speech rates (see figure). While the preliminary results fail to demonstrate that L2 speakers actively anticipate an object following

the verb at any input rate, we do see that WM plays a role in accurate comprehension.
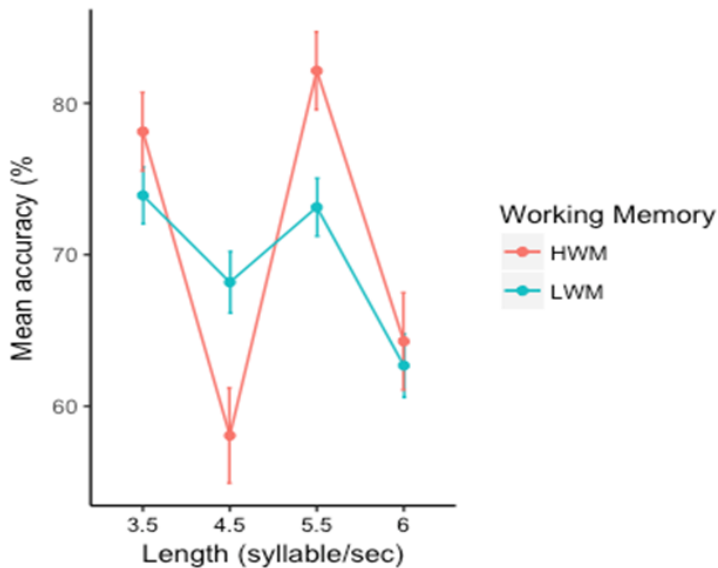
Figure 1: Accuracy across speech rate and WM capacity

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Is there L1 attrition outside the L2 environment? Anaphora resolution by L2 English - L1 Italian, Serbian and Croatian translators

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Several studies have linked the internal linguistic system of translators to that of first language (L1) attriters. Cardinaletti (2005), for instance, interpreted the overuse of overt pronouns found in translations from English into Italian as an indication of L1 attrition in experienced translators, attributable to their prolonged exposure to a second language (L2), albeit in a non-L2 environment.

To test this link experimentally, we conducted three studies on the resolution of intra-sentential anaphora. All studies involved experienced and/or trainee translators, and a control group of non-translators. The L1s explored were Italian, Serbian and Croatian, null-subject languages in which null pronouns prefer the subject antecedent and overt pronouns a non-subject antecedent in intra-sentential anaphora (Table 1 provides Italian examples); the L2 translated from was always (non-null-subject) English. The participants did a self-paced picture selection task that required reading sentences with null and overt pronouns, which either followed or preceded the candidate antecedents, and matching each sentence to one of three pictures, showing the antecedent as the subject, the object or an extra-linguistic referent (Figure 1); reaction times were also recorded. The translators were expected to select the subject as the antecedent of overt pronouns more than the control group, pointing to (incipient) L1 attrition.

The results revealed that the translators patterned with the controls in their referent choices in the null subject conditions, and they overall selected the subject as the overt pronoun antecedent less than the non-translators, as evidenced by a significant interaction between subject group and pronoun type in all three logistic regression analyses (subject group on its own did not have a significant role in predicting the referent choice). This seems to

suggest that evidence of (incipient) attrition in translators is absent; however, we postpone the final conclusion for when we complete the ongoing analysis of reaction times.

Table 1: Experimental conditions

Anaphora with a null pronoun	*Il papà$_i$ saluta il figlio$_j$ mentre Ø$_i$ va in bicicletta.* the dad greets the son while *pro* rides on bike
Anaphora with an overt pronoun	*Il papà$_i$ saluta il figlio$_j$ mentre lui$_{j/k}$ va in bicicletta.* the dad greets the son while he rides on bike
Cataphora with a null pronoun	*Mentre Ø$_i$ va in bicicletta, il papà$_i$ saluta il figlio$_j$.* while *pro* rides on bike the dad greets the son
Cataphora with an overt pronoun	*Mentre lui$_{j/k}$ va in bicicletta, il papà$_i$ saluta il figlio$_j$.* while he rides on bike the dad greets the son

Figure 1: Example of a picture set from the picture selection task

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The development of functional code switching in bilingual twins: A pragmatic approach

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Linguistic studies on multilingualism that have been published since the 1970s have shown that code-switches by adult multilingual speakers are not incidental but, to the contrary, serve a number of important discourse functions. Code-switches of bilingual children, however, were often interpreted as a result of children's inability to separate the languages (cf. Taeschner 1983). More recent studies have challenged this opinion and the now prevailing view in language acquisition literature is that bilingual children have two separate systems from the beginning and are thus able to differentiate between their languages from a very early age (cf. De Houwer 1990, Lanza 1997). The insight that language switches of young bilinguals are only partly due to lacking linguistic competence and vocabulary gaps leads to the question what the actual functions of these switches are and how children develop the pragmatic competence that is necessary for adult-like code-switching.

In order to answer the above questions code-switching data from English-German bilingual twins, gathered as part of the PhD project „The development of functional code switching in bilingual twins: A pragmatic approach", will be presented. The language data were gathered in a longitudinal observational study over a time span of 16 months, during which the twins were between 6;5 (6 years, 5 months) and 7;11 years old. The language switches were analysed using Auer's (1995) conversation analysis framework and are complemented by a questionnaire on language use and attitudes towards bilingualism in the family. First results of the analysis demonstrate that a certain number of the twins' language switches are caused by competence and must therefore be interpreted as transfer or code-shift (cf. Silva-Corvalàn 1983). However, the data also contain a number of "true", adult-like code-switches that are

pragmatically motivated and serve important discourse functions in the twins' bilingual interaction, especially in conflict situations.

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Bilingual children process *which*-questions in the same way as monolingual children: A visual world paradigm study

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The processing of *wh*-questions in monolingual (L1) English children is moderated by the presence of disambiguating features (e.g. number mismatch between NPs in the sentence, Contemori, Carlson & Marinis, 2017) but this impact has not been investigated in bilingual children. As Contemori et al showed differences between adults and 5-7 year-old children for overall accuracy, i.e. ceiling effects were only observed for the adults, we tested 8-11 year-old children. 47 children (14 simultaneous or sequential bilinguals, M= 9;6 years, with 2 years minimum exposure to English, M=7;2; we are currently recruiting 16 more bilingual children) participated in a visual world paradigm task. Participants heard questions (e.g. "Which bear is chasing the camel?"), looked at two minimally different pictures while a Tobii X120 eye-tracker measured their eye-gaze, and had to click on the correct picture to answer a comprehension question. We manipulated syntactic structure (subject vs. object which-questions), number of both NPs (match vs. mismatch), and number of the first NP (singular vs. plural). For accuracy, there was an effect of structure (higher accuracy for subject- compared to object which-questions) but no effect of group. Mixed effects linear regression models fitted to the gaze data in ten 200ms bins showed participants had overall greater difficulty with object which-questions, questions and where both NPs had the same number (fewer looks towards the correct picture). No main effect of group was found in any bin. There was no correlation between accuracy and either age of onset or length of exposure. The results indicate that 9-to-11 year old bilingual children process which-questions in the same way as monolingual children in terms of accuracy and eye-gaze and their performance is affected by the same factors which impact monolingual processing.
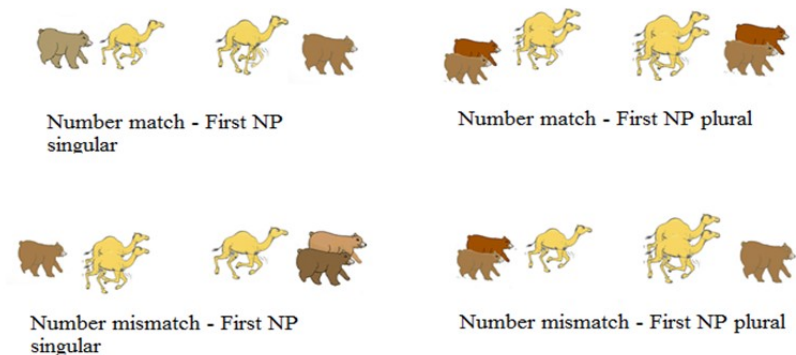
Figure 1: Sample visual stimuli (target pictures for subject were competitors for object *wh*-questions)
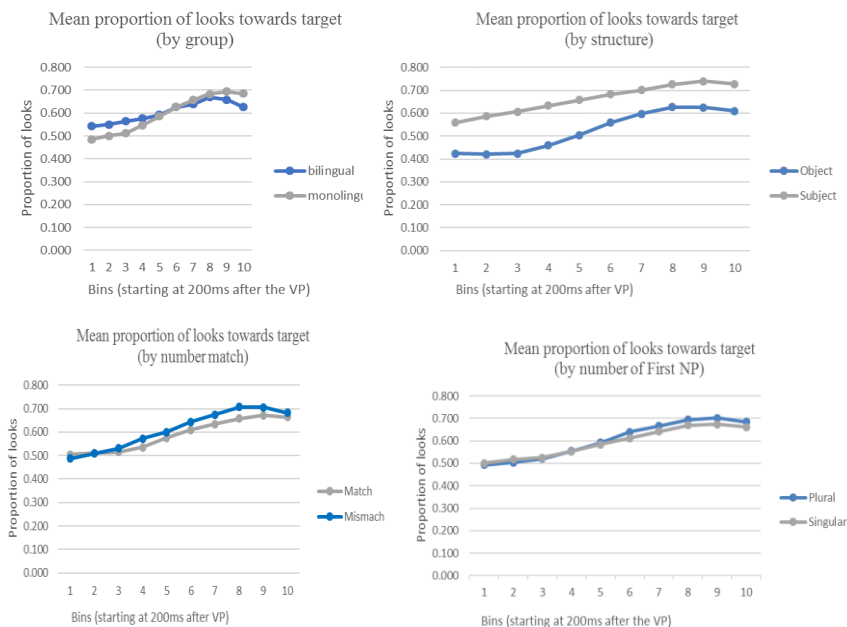
Figure 2: Overview of data (proportion of looks towards target relative to looks to target and competitor)

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Using corpus methods to investigate parsing strategies: The position of antecedent strategy in late bilinguals (L1 English – L2 Spanish learners)

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A well-studied phenomenon in the psycholinguistic literature is Anaphora Resolution (AR). It relates to how anaphoric forms corefer with their antecedents. PAS is a structural parsing strategy whereby a null pronominal subject (∅) biases towards an antecedent in a structurally higher (subject) position, which marks topic continuity. By contrast, an overt pronoun (*él/ella*) biases towards a non-subject antecedent, which marks topic shift.

The PAS has been extensively studied in the psycholinguistic literature with Spanish natives, L2 Spanish late bilinguals and Heritage Speakers of Spanish (Alonso-Ovalle et al. 2002, Bel & García-Alcaraz 2015, Bel et al. 2016a, 2016b, Filiaci et al 2014, Jegerski et al. 2011, Keating et al. 2016). Advanced and near-native learners of L2 Spanish typically show deficits when processing PAS, arguably as a result of their limitations when integrating simultaneously syntactic information (overt/null alternation) with discursive information (topic/focus) at the syntax-discourse interface during online processing, as predicted by the Interface Hypothesis (Sorace 2011). However, most of these studies are experimental and have investigated PAS in decontextualized scenarios.

Production data offers contextually richer scenarios and reveal new insights into AR processing. We therefore present evidence from naturalistic production data from the CEDEL2 corpus (http://cedel2.learnercorpora.com), an 800,000-word corpus of L1 English-L2 Spanish (Lozano & Mendikoetxea 2013). Two proficiency-level samples of late bilinguals (plus a Spanish native control subcorpus) were linguistically annotated following a linguistically-informed tagset implemented in UAM Corpus Tool (O'Donnell, 2009).

The corpus results (figure 1) confirm previous experimental work: late bilinguals show native-like behaviour in terms of the PAS, as all

groups produce a null subject pronoun to refer to a subject antecedent. But corpus data reveal that preferences for non-subject antecedent are more complex than previously assumed because overt pronouns do not show a clear bias and NPs are also produced in these contexts (which was previously overlooked). Additionally, results show cross-linguistic influence from specific properties of their L1. Finally, the IH is confirmed because late bilinguals show deficits at the syntax-discourse interface.
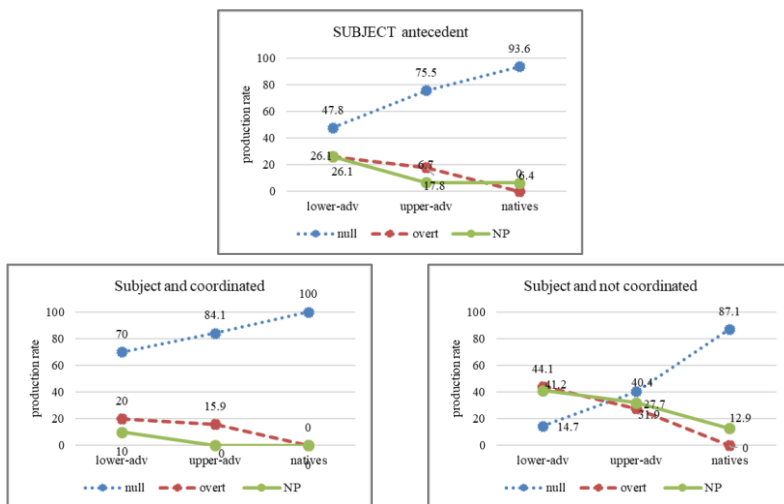

Figure 1

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Sensitivity to verb bias and semantic persistence in the L2: An eye-tracking study with German and Turkish learners of English

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L2 readers have difficulty with reanalysis, leading to semantic persistence of garden paths [1, 2]. This study investigates whether L2 learners can use verb bias, i.e. frequency information about the type of verb complements, to ease reanalysis. Some findings suggest that even L2 learners with a verb-final L1 show sensitivity to verb bias [3], while others underscore the effect of L1 word order on sensitivity to verb bias in L2 processing [4].

We focus on L1 German and L1 Turkish. German has a predominantly subject-verb-object word order in main clauses, i.e. the verb can be used to generate predictions about upcoming structure. By contrast, Turkish is a verb-final language; the verb cannot give rise to expectations for incremental parsing.

64 L1 German and L1 Turkish intermediate to advanced L2 learners of English were tested in an eye-tracking reading experiment, in which we manipulated the main-clause verb to have either a direct-object (DO) or a sentential-complement (SC) bias as well as the plausibility of the final segment to be either semantically matched or mismatched with the initial garden path, i.e. the direct-object interpretation (1). L1 German learners, unlike Turkish learners, showed effects of verb bias at the syntactic disambiguation segment and at the final segment, with longer reading times in (1a, b) than in (1c, d). For the final segment, both learner groups showed longer reading times in (1b, d) than in (1a, c), yet no interaction of verb bias and plausibility. Together, these findings provided evidence for L1 word order influence on L2 sensitivity to verb bias but general L2 semantic persistence effects, indicating that L2 learners failed to complete the reanalysis process irrespective of their sensitivity to verb bias. This offers support for the view that L2 learners may not

integrate multiple information cues efficiently during real-time sentence comprehension.

Materials
(1) a. DO-bias semantic match:
They *observed* the insects <u>were really</u> and truly <u>brilliantly coloured</u>.

b. DO-bias semantic mismatch:
They *observed* the insects <u>were really</u> and truly <u>impossible to notice</u>.

c. SC-bias semantic match:
They *realized* the insects <u>were really</u> and truly <u>brilliantly coloured</u>.

d. SC-bias semantic mismatch:
They *realized* the insects <u>were really</u> and truly <u>impossible to notice</u>.

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Prosodic cues facilitate morphological anticipation in monolinguals and bilinguals

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Anticipation is integral to L1 sentence processing [1], but its role in L2 sentence processing is undefined. Intermediate learners make reduced/no use of morphological cues to pre-activate referents [2, 3, 4, 5]. However, it is unclear whether advanced L2 learners use morphological [6] and prosodic [7] cues to predict morphological information or not (morphological cues: [5, 8]; prosodic cues: [9]). We investigate whether monolinguals and late learners use prosody to anticipate morphology, and whether first-syllable structure (CV, CVC) and L2 proficiency mediate their anticipatory abilities. Prosody is essential to process sentences [10] and words [11], and syllable structure is crucial to evaluate the effects of CVC's extra acoustic information (nasal coda) on anticipation.

Thirty-eight Spanish monolinguals and 12 beginning and 26 advanced adult English learners of Spanish completed a background questionnaire, an L2 proficiency test, and a visual-world eye-tracking test (66 sentences: 18, practice, 32 fillers, 16 experimental). In the latter, they saw two words on a screen (paroxytone: first syllable stressed, *CANta* "s/he sings"; oxytone: first syllable unstressed, *canTÓ* "s/he sang"), heard a sentence containing one of the two words, and chose the word they had heard. Stress is different in English (stressed-timed [12], weak functional load [13]) and Spanish (syllable-timed [12], strong functional load [14]). Spanish listeners have to attend to stress to reduce competition, but English listeners do not (unstressed vowel reduction is sufficient for lexical differentiation) [15, 16].

GLMMs revealed that the monolinguals, but not the beginners, used prosodic information to guess words before hearing suffixes. The advanced learners mirrored the monolinguals, except in words with first-syllable CV structure, but a growth curve analysis showed that they were slower than the monolinguals. These findings show

that prosody facilitates morphological anticipation, and that adult learners can gain anticipatory processing patterns qualitatively, but not quantitatively, similar to monolinguals.

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Pronouns and proficiency affect OVS comprehension in bilingual preschoolers

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Bilingual and L2 learners often have problems understanding non-canonical sentences ([1,2]). These difficulties may be related to processing factors [2,3], information structure [4] and/or acquisition of case marking [5]. German monolingual 5-year-olds often comprehend non-canonical OVS sentences around chance level [6,7], but accuracy rates increase when the object is a pronoun [7]. Russian monolingual 5-year-olds show high accuracies rates regardless of context [8]. We examined how topic-first contexts, pronominal topics and language proficiency influence OVS comprehension in dual languages of Russian-German bilingual preschoolers.

SVO and OVS sentences were presented after three different introduction contexts (Tab. 1). In neutral and topicNP trials both arguments were realized as lexical NPs, but the first NP was either new or the topic. In topicPr trials, the initial topicalized NP was a pronoun. Word order was indicated by case marking on the pronoun and NPs (bold markings in Tab. 1). Test sentences were followed by cartoon movies showing the action with correct or reversed thematic roles. Children had to say whether the movies showed the correct action or not. 27 bilingual 5-year-olds with L1/Russian and L2/German performed the comprehension task and language proficiency tests in both languages.

In Russian, OVS comprehension accuracy was above chance level only in the topicPr context; in German, OVS accuracy was at chance level in all contexts (Fig. 1). In each language, OVS comprehension accuracy was correlated moderately and positively with language proficiency. Topic context may not influence accuracy because it merely eases discourse integration [9]. Pronouns may increase accuracy rates because they reduce interference effects [3]. Yet, pronouns may not influence accuracy in German due to the children's lower proficiency. The results provide new evidence for the

importance of considering processing factors and language proficiency in bilingual comprehension.

Table 1: Conditions in the Russian and German experiment (disambiguating case marking in bold)

| Context	Word Order	
	SVO	*OVS*
	Russian	
Look what is happening here. (neutral)	**Obez'ana** sejčas pojmaet **myšku**. **monkey.nom** now catches **mouse.acc** "The monkey will catch the mouse."	**Obez'anu** sejčas pojmaet **myška**. **monkey.acc** now catches **mouse.nom** "The mouse will catch the monkey."
Now you hear a story about the monkey. (topNP)	**Obez'ana** sejčas pojmaet **myšku**. **monkey.nom** now catches **mouse.acc** "The monkey will catch the mouse."	**Obez'anu** sejčas pojmaet **myška**. **monkey.acc** now catches **mouse.nom** "The mouse will catch the monkey."
Now you hear a story about the monkey. (topPr)	**Ona** sejčas pojmaet **myšku**. **she.nom** now catches **mouse.acc**. "She will catch the mouse."	**Eë** sejčas pojmaet **myška**. **her.acc** now catches **mouse.nom** "The mouse will catch her."
	German	
Look what is happening here. (neutral)	**Der** Affe fängt gleich **den** Krebs. **the.nom** monkey catches now **the.acc** crab "The monkey will catch the crab."	**Den** Affen fängt gleich **der** Krebs. **the.acc** monkey catches now **the.nom** crab "The crab will catch the monkey."
Now you hear a story about the monkey. (topNP)	**Der** Affe fängt gleich **den** Krebs. **the.nom** monkey catches now **the.acc** crab "The monkey will catch the crab."	**Den** Affen fängt gleich **der** Krebs. **the.acc** monkey catches now **the.nom** crab The crab will catch the monkey."
Now you hear a story about the monkey. (topPr)	**Er** fängt gleich **den** Krebs. **he.nom** catches now **the.acc** crab. "He will catch the mouse."	**Ihn** fängt gleich **der** Krebs. **him.acc** catches now **the.nom** crab The crab will catch him."
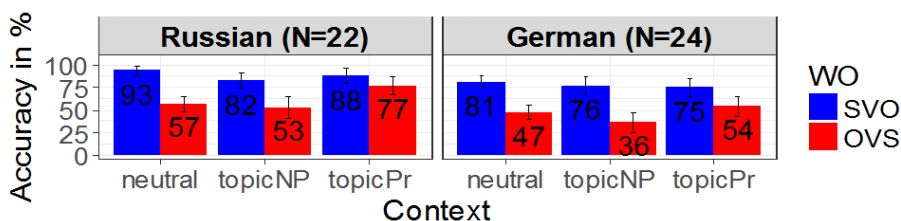
Figure 1: Comprehension accuracy in Russian and German (excluding children with yes/no-bias (≥18/24))

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The (non)interaction of discourse and grammatical cues in L1 and L2 processing: The case of English singular *they*

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While research suggests that L2 speakers rely more heavily on discourse cues than L1 speakers during real-time processing (Cunnings, 2017), how discourse and grammatical cues interact in L1 and L2 comprehension remains of interest. The present study investigates how the plural grammatical cue of English singular *they* (a grammatically plural pronoun used to refer to a grammatically singular antecedent; Figure 1) interacts with discourse cues (referential status) of the antecedent to shape L1 and L2 speakers' real-time processing and final interpretations. In a self-paced reading task, L1 English monolinguals and L1 German-L2 English speakers read sentences containing either a referential (e.g., *that jogger at the intersection*) or a nonreferential (e.g., *a jogger*) antecedent. A second clause referred to this antecedent using a grammatically singular (*he/she*) or plural (*they*) pronoun. Following each sentence, participants indicated whether the subject was singular or plural. L1 and L2 English speakers showed no reading time differences for *they* vs. *he/she* in either referential context (Figure 2), suggesting that neither group had difficulty integrating the plural feature of *they* while reading. Interpretation responses revealed that L1 and L2 speakers were more likely to interpret the subject as plural with nonreferential than referential antecedents. L1 speakers also showed an increase in plural responses in nonreferential contexts after reading *they* vs. *he/she*, but not in referential contexts (Figure 3); L2 speakers showed an increase in plural responses after reading *they* vs. *he/she* in both referential contexts (Figure 4). These results suggest that the L2 speakers were not sensitive to the interaction between the grammatical cues of singular *they* and the discourse (referential) cues of the antecedent. The L1 speakers' interpretations, conversely, were modulated by the discourse cue of the antecedent.

This highlights that L2 speakers may not always privilege discourse over grammatical cues during language processing.

Nonreferential antecedent, singular pronoun	Nonreferential antecedent, plural pronoun
A jogger should wait at a red light, even if *he/she* feels impatient, because it could be dangerous to cross the street.	*A jogger* should wait at a red light, even if *they* feel impatient, because it could be dangerous to cross the street.
Referential antecedent, singular pronoun	Referential antecedent, plural pronoun
That jogger at the intersection should wait at a red light, even if *he/she* feels impatient, because it could be dangerous to cross the street.	*That jogger at the intersection* should wait at a red light, even if *they* feel impatient, because it could be dangerous to cross the street.

Interpretation question: *Does more than one jogger feel impatient?*

Figure 1: Sample stimulus item in each of the four conditions and interpretation question
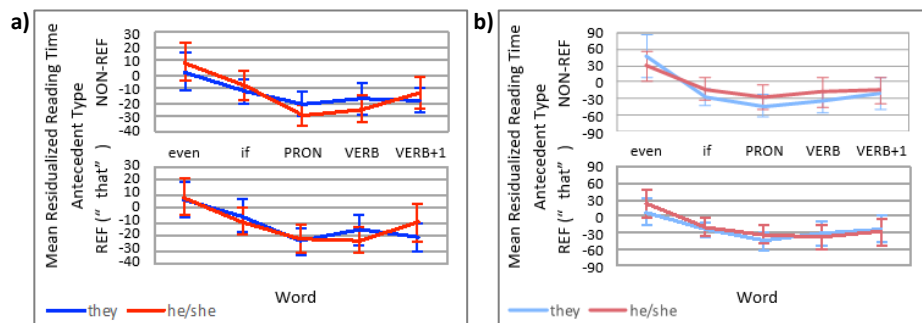

Figure 2: Mean residualized reading times (NON-REF = nonreferential, REF = referential, PRON = pronoun, VERB = verb following pronoun, VERB+1 = word after verb) for (a) L1 and (b) L2
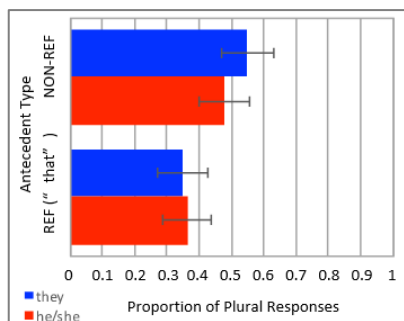

Figure 3: L1 Proportion of Plural Interpretations (NON-REF = non-referential, REF = referential)
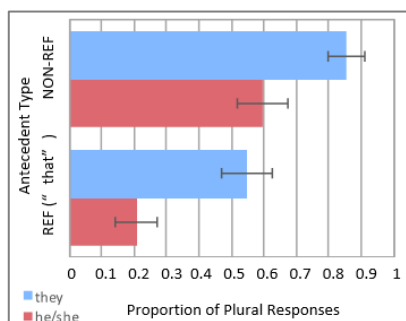
Figure 4: L2 Proportion of Plural Interpretations (NON-REF = non-referential, REF = referential)

Predictive use of grammatical case in bilingual children is modulated by task

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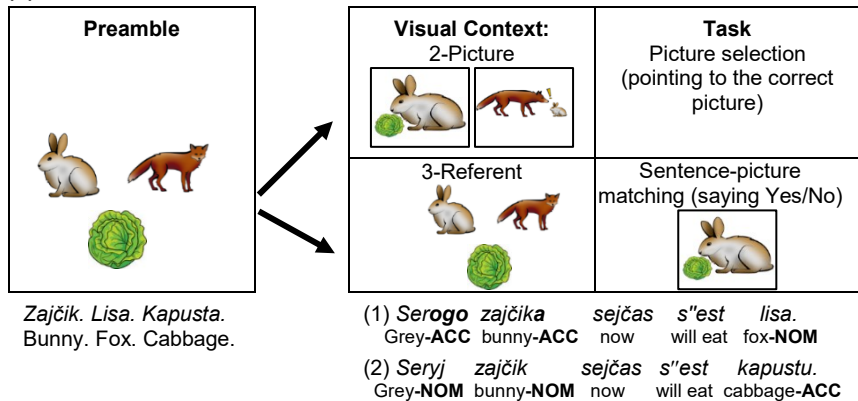
The ability to rapidly generate predictions based on linguistic cues, including case markers, is critical for learning about complex contingencies in language (Phillips & Ehrenhofer, 2015). There is an ongoing debate on whether German children can anticipate OS word order from the Accusative case (ACC) on the object and assign such sentences a correct parse (No: Schipke et al., 2012; Sauermann & Höhle, 2016 vs. Yes: Özge at al., 2016). Russian children can do it faster because of special salience of the Russian case system (Sekerina & Mitrofanova, 2017).

In the present study, we extend the debate to bilinguals and test the predictive strength of ACC case in 3-to-6-year-old Russian-German (*N*=37) and age-matched Russian (*N*=66) monolingual children. They participated in a Visual World eye-tracking study that employed a 2x2 design, with Word Order (OVS (1) vs. SVO (2)) crossed with Task (3 single referents as in Özge et al., 2016 vs. 2 pictures side-by-side, Fig. A). In the response-based 3-Ref task, children verbally accepted/rejected a picture; in the simpler 2-Pic task, they selected the correct picture by pointing.

The accuracy in both groups in the OVS condition (2) was excellent, with monolinguals (92%) slightly outperforming bilinguals (88%). **2-Pic Task (**Fig. B)**:** The proportions of looks in both groups revealed a main effect of Word Order and early interaction between Word Order and Group. Monolinguals fixated the correct picture already at N1-ACC and showed a stronger Word Order effect. In contrast, bilinguals needed the Verb. **3-Ref Task** (Fig. C)**:** The monolinguals started to anticipate the agent (*fox*) in the OVS condition at N1-ACC, just like in the 2-Pic task. The bilinguals' fixations occurred only at N2-NOM. Thus, although bilingual children
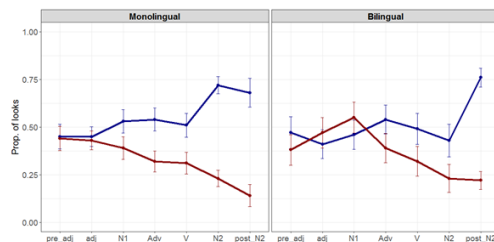
can use case predictively, the timing is modulated by task, in addition to other factors (cognitive capacity, Zhang & Knoeferle, 2012).

(A)

Preamble		Visual Context: 2-Picture	Task Picture selection (pointing to the correct picture)

	3-Referent	Sentence-picture matching (saying Yes/No)

Zajčik. Lisa. Kapusta.
Bunny. Fox. Cabbage.

(1) *Ser**ogo** zajčik**a** sejčas s"est lisa.*
    Grey-**ACC** bunny-**ACC** now will eat fox-**NOM**

(2) *Ser**yj** zajčik sejčas s"est kapustu.*
    Grey-**NOM** bunny-**NOM** now will eat cabbage-**ACC**

(B)   2-Picture Task (new)

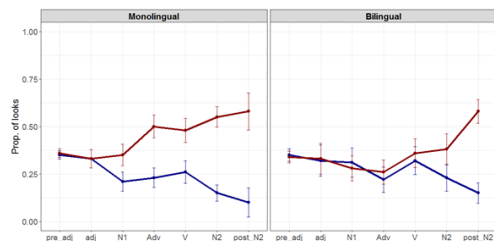

Lines mean different things in SVO and OVS conditions:

Blue line -- Looks to the picture with the agent (*bunny*) in SVO => correct picture

Red line – Looks to the picture with the agent (*bunny*) in OVS => wrong picture

(C)   3-Referent Task (as in Özge at al., 2016)

Blue line -- Looks to the Competitor referent (*fox*) in the SVO condition (instead of anticipatory looks to *cabbage*)

Red line –Anticipatory looks to the Agent referent (*fox*) in the OVS condition

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Cross-language transfer in a bilingual school in Germany: The case of receptive grammar

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In Germany about 2% of all private and public schools are currently offering a bilingual program (FMKS, 2014). Such programs are particularly effective when several school subjects are taught in a foreign language (L2) for many years (e.g. Wesche 2002).

Cross-language effects are of particular interest in such a context: So far, studies have focused on such effects for reading (e.g. Gebauer et al. 2013). Cross-language effects of grammar have not been examined in a bilingual school context yet, although there is an extensive literature on cross-language effects on grammar in general (e.g. Ellis 2008). This study, therefore, investigated cross-language transfer between first-language (L1) and L2 receptive grammar skills in a group of 50 German primary school students who were enrolled in a German-English bilingual program. In contrast to many other bilingual programs in Germany, the English teachers in this school are native speakers, and extracurricular activities are carried out not only in German but also in English. Students were tested at the beginning and end of grades 3 and 4, using the German and English version of the TROG (Test for Reception of Grammar; Bishop 2003, Fox 2010).

As expected, the results showed improvement for both tests as a function of time. Significant effects of gender, social and language background were not noted. In addition, cross-language effects were found, supporting previous findings which indicated reciprocal transfer effects between L1 and L2 (e.g. Gebauer et al. 2013). The effects from L2 to L1 may be attributable to the plentiful opportunities for academic input in the L2 at school. Hence, grammar skills, which provide the basis for successful participation in school, can evidently be acquired in an L2 context and transferred to the L1. These findings underline the importance of cross-language transfer between receptive grammar skills in bilingual programs.

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Digit span error patterns in bilinguals and monolinguals

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Research shows that bilinguals tend to outperform monolinguals on certain cognitive and linguistic tasks [1, 2, 4, 5, 6]. While the mechanisms underlying these advantages remain unclear, it has been suggested that bilinguals may have enhanced auditory memory [3], which may be responsible for the linguistic advantages observed in these populations [8]. Bilinguals have been shown to perform better than monolinguals in tasks involving episodic memory recall [7], but it is unclear whether bilinguals also have an advantage in certain aspects of auditory short-term memory, such as memory for digit serial positioning. To address this question, auditory short-term memory error was compared between monolingual and bilingual undergraduate students using a recall task. The experiment was based on an adaptive digit span task that required participants to recall strings of digits. The task started with 2 digits, and gradually increased the number of digits until the participant made a critical proportion of mistakes. Next, the digit span scores were algorithmically adjusted following [9]. This was done in order to reveal not only if each digit was correct, but also the existence of serial errors and digit scrambling. The results showed that bilinguals significantly outperformed monolinguals, with bilinguals displaying not only better memory of the values, but also better memory of the serial position of each digit (p<.02, d=.61). The computational methods developed in this experiment will help guide paths for further research on the impact of bilingualism on primacy and recency effects in auditory short-term memory, along with memory for digit serial positioning across bilinguals and monolinguals.
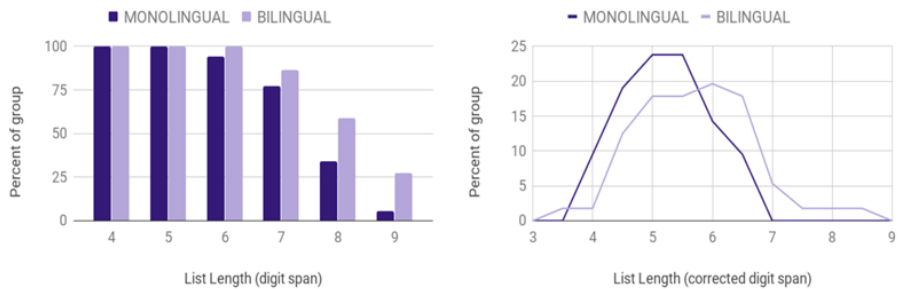
FIGURE 1: LEFT: *Percentage of participants who advanced to each list length.* RIGHT: *Percentage of participants with each corrected digit span score (ranging from 3 to 9 digits).*

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Attention benefits and burdens in natural bilingual reading

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Bilinguals read less fluently in their weaker, second language [1]. This processing disadvantage corresponds to bilingual models of lexical access [2] and models of reading [3] because L2 words are used less frequently, so that their processing consumes more cognitive resources. Yet, lower-frequency items also have a processing advantage if their relative novelty attracts selective attention [4]. In this talk, we investigate how these procedural burdens and benefits interact in determining how much language-specific attention bilinguals pay to persuasive messages.

We tested 102 unbalanced bilinguals in a mixed-factorial design with picture attraction (low vs. high) as between and language (L1 German vs L2 English) as a within-subjects factor. To measure language-selective attention, eye movements were recorded while participants watched twelve online advertisement slogans in each language competing for attention against large pictorial eye-catchers. We inferred language-specific baseline reading fluency from a separate eye-tracking task, where participants paid undivided attention to reading two pages of a novel in each language consecutively [adapted from 1]. Results showed longer L2 word reading times (9%) for the novel, while participants dwelled 11-15% longer on L2 slogans, relative to L1, depending on the competitive attractiveness of the picture. We used linear mixed effects regression to control for random differences in participants, items and L1 reading fluency. The models indicated that the L2 slogans robustly attracted more selective attention, compared to L1, because their less automatic processing was only partially predicted by less fluent L2 reading skills. In sum, we find bilinguals may pay more attention than needed for comprehension to the same task if it is presented in the L2. We discuss theoretical implications for modelling bilingual reading as well as practical consequences for persuasive communication and bilingualism research.

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Processing (non)derivational L2 Japanese verbs by L1 Chinese and Korean speakers

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This study tested the L1-and-L2 morphological congruency effect in L2 syntax processing (e.g., Hawkins & Liszka, 2003; Jiang et al., 2011, 2017; Scherag et al., 2004). Transitive verbs (*kowas-u* 'break') in Japanese have a derivational relation with potential verbs (*kowas-eru*), and a nonderivational relation with intransitive verbs (*koware-ru*). Korean shares a similar non(derivational) verbal feature with Japanese, but not Chinese. Three participant groups composed of native (L1) Japanese speakers, L1 Korean and L1 Chinese speakers learning L2 Japanese were examined using a cross-model priming experiment. Lexical decisions for visually-presented transitive verbs were performed under three phonetically-primed conditions: (1) derivative potential verbs, (2) nonderivative intransitive verbs, and (3) white noise as the control condition. For L1 Japanese, lexical decisions for transitive verbs primed by potential verbs were 65 ms faster (i.e., priming effects) than those for the same transitive verbs primed by the white noise condition. Likewise, lexical decisions for transitive verbs primed by intransitive verbs were 28 ms faster when compared to the control condition. Furthermore, lexical decisions under the potential-verb-primed condition indicated significantly greater priming effects (37 ms) than those under the intransitive-verb-primed condition. Thus, L1 Japanese speakers were sensitive to non(derivative) relations of verbs constantly throughout all trails. Similar to L1 Japanese, L1 Korean learning L2 Japanese also displayed a similar priming effect trend: 180 ms for the intransitive-verb-primed condition and 203 ms for the potential-verb-primed condition, and the 23 ms difference between these two effects was also significant. However, this difference in the processing between nonderivational and derivational relations diminished. Unlike L1 Koreans, while both conditions showed significant priming effects for L1 Chinese, no significant difference was observed between the

priming effects of intransitive-verb-primed (109 ms) and potential-verb-primed conditions (140 ms). Accordingly, this study supported the L1-and-L2 morphological congruency effect in Japanese non(derivational) verbal relations.
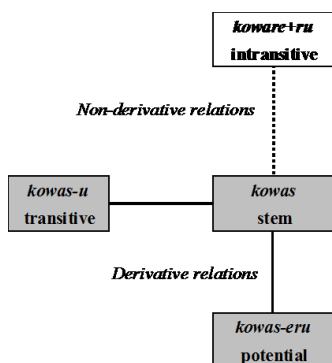

Figure 1: (Non)derivative relations of intransitive, transitive, potential forms in Japanese verbs
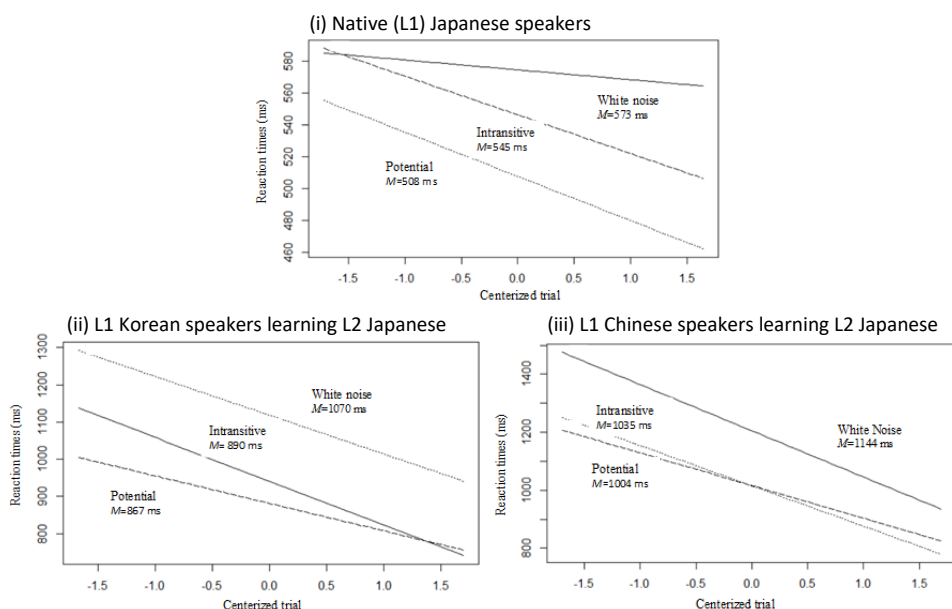

Figure 2: Processing of target Japanese transitive verbs primed by potential, intensive and white noise by L1 Japanese, and L1 Korean and L1 Chinese speakers learning L2 Japanese

Code-switching patterns en un modelo computacional: Simulating code-switching in a bilingual sentence-production model

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Although much is known about factors that facilitate or inhibit code-switching in both comprehension and production, the underlying mechanisms are still not very well understood. Using computational cognitive modeling one can simulate code-switching behavior in multilinguals with the goal to explain the code-switching process. For this reason, we have extended Dual-path (Chang, 2002), a connectionist model of monolingual sentence production, to handle two or more languages (Tsoukala et al., 2017). The Dual-path model is trained on message-sentence pairs and it learns to produce a sentence, word by word, given its semantic representation. For instance, the simple message "AGENT=DEF, WAITER; ACTION=EAT;" is expressed in English as "The waiter is eat-ing". Using the bilingual Dual-path model we have simulated sentence production in early (simultaneous) Spanish-English bilinguals and late speakers of English who have Spanish as a native language ("late bilinguals"). We then manipulated language control to allow the model to produce sentences in either language or to code-switch. It is important to note that the model was not taught to code-switch through, e.g., code-switched input, it solely learned to code-switch through the language control manipulation. The model shows how code-switching patterns differ between early and late bilinguals. The early bilingual model code-switches much more frequently: 17% of produced sentences contained a code-switch as opposed to 1% in the case of the late bilingual model. Furthermore, most code-switches in the early bilingual models were intra-sentential (7.5% as opposed to 0.34% in the late bilingual case), whereas the late bilingual models mostly borrowed nouns from their L1 Spanish when producing L2 English. Both model behaviors are in line with previous empirical findings

(Poplack, 1980). Therefore, using this cognitive model we can proceed in further examining the code-switching process.

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Bilingual metalinguistic awareness: How simultaneous language activation and dominance patterns interact

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While evidence for a bilingual advantage in metalinguistic awareness (MA) tasks requiring control (e.g., form-function separation) is solid [1,3], the bilingualism effect on MA-tasks of linguistic analysis (grammaticality judgements) is controversial [2]. Moreover, the interaction with dominance effects remains unexplored. This study analyzes the effects of a bilingual-mode setting on a graded grammaticality judgment task (GGJT) in the bilinguals' non-dominant language. Participants had also to justify their answers.

Forty Greek-Italian bilingual children (8.00-11.8yrs.) living in Greece and Greek dominant (vocabulary and syntactic skills and questionnaires) were asked to judge the relative (un-)acceptability of Italian sentences that describe pictures (Picture1), using a five-point 'smiley-face'. The same set of 8 target sentences was presented following three different training sessions: in *mat1* the (un-)grammatical sentences appeared in isolation, in *mat2* with their (un-)grammatical counterparts in Italian, and in *mat3* with their (un-)grammatical counterparts in Greek (*mat3*) – Table 1. The sentences targeted different syntactic structures (subject-verb agreement and number, gender and case with clitics). We tested whether the monolingual- vs. bilingual-mode affects GGJT.

A 2x3 ANOVA with 1-5 ratings as dependent variable and grammaticality and training session as independent revealed an interaction of *grammaticality* x *training-session* ($F(2)=4.43$, $p=.01$). Incorrect sentences were judged more acceptable after *mat1* and *mat2* than after *mat3*. (Figure1). A 2x4 repeated ANOVA with ratings as dependent variable and grammaticality and type of structure as independent showed a *grammaticality* x *structure* interaction ($F(3)=2.9$, $p=.04$). Sentences with incorrect clitic-case and number were judged more acceptable than sentences with incorrect clitic-gender and subject-verb agreement (Figure2).

The results show that a bilingual-mode setting affects GJT positively. Explicit knowledge in the non-dominant language benefits from the

activation of MA-skills in the dominant one. We interpret the results related to the type of structure in terms of core syntactic violations vs. violations at the syntax-discourse interface.

MAT1	MAT2	MAT3
SV-agreement	**SV-agreement**	**SV-agreement**
[-GRAMMATICAL]: Gli uomini accarezza l'orso.	I ciclisti guidano le biciclette [+GRAMMATICAL]: I ciclisti guida le biciclette [-GRAMMATICAL]	Italian [+GRAMMATICAL]: Gli infermieri salutano la dottoressa Greek [-GRAMMATICAL]: Oi giatroi xeretái ti nosokóma.
*The men caress**es** the bear	The bike-riders drive the bikes *the bike-riders drive**s** the bikes	Italian:The doctors greet the nurse *Greek: The doctors greet**s** the nurse.
[+GRAMMATICAL]: I ciclisti inseguono la scimmia.	I pasticcieri prepara la torta [-GRAMMATICAL]: I pasticcieri preparano la torta [+GRAMMATICAL]	Greek [+GRAMMATICAL]: Oi agrótes mazévoun louloúdia Italian [-GRAMMATICAL]: I contadini raccoglie i fiori.
The bike-riders follow the monkey	The pastry chefs bake**s** the cake the pastry chefs bake the cake	Greek:The farmers collect the flowers *Italian: The farmers collect**s** the flowers
SV-agreement	**SV-agreement**	**SV-agreement**
[+GRAMMATICAL]: I musicisti suonano gli strumenti.	[+GRAMMATICAL]: I musicisti suonano gli strumenti.	[+GRAMMATICAL]: I musicisti suonano gli strumenti.
The musicians play the instruments	The musicians play the instruments	The musicians play the instruments
[-GRAMMATICAL]: Gli infermieri cura il malato.	[-GRAMMATICAL]: Gli infermieri cura il malato.	[-GRAMMATICAL]: Gli infermieri cura il malato.
*The male nurses take**s** care of the sick person	*The male nurses take**s** care of the sick person	*The male nurses take**s** care of the sick person

Picture 1: A GGJT (five point 'smiley-face')
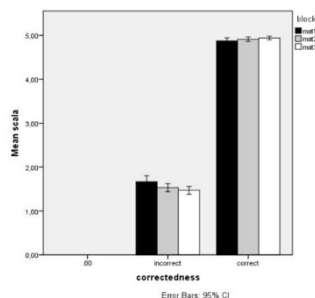

Figure 1: GJs across conditions and training sessions
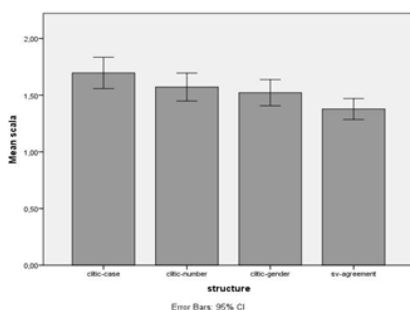

Figure 2: GGJTs for incorrect sentences across type of structures

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Priming possessives in bilingual children: Testing for cross-linguistic influence

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The general consensus in the child bilingual literature is that bilingual children's two languages develop separately (e.g., De Houwer, 1990), but under certain circumstances, one may influence the other (e.g., Hulk & Müller, 2000). Recent work using structural priming (e.g., Hsin et al., 2013; Vasilyeva et al., 2010) suggests, however, that early bilinguals may in fact share syntactic representations across languages. In light of these findings, it has been proposed that cross-linguistic influence (CLI) can be conceptualized as cross-language structural priming (Hervé et al., 2016; Serratrice, 2016). This study tests this proposal using data on possessive NPs in Dutch. Like English, Dutch allows both pre-nominal and post-nominal possessives, whereas only post-nominal possessives are possible in Spanish (Table 1). For common animate possessors, preferences differ, however, with Dutch preferring the post-nominal and English the pre-nominal.

Participants are English-Dutch (n=25) and Spanish-Dutch (n=25) 4- to 6-year-old bilinguals, plus monolingual peers (n=25). Pre- and post-nominal possessives are primed using a "snap" game (Messenger et al. 2012) with a baseline, priming and post-test phase (Skarabela & Serratrice, 2009). Within-language (Dutch to Dutch) and cross-language (English/Spanish to Dutch) priming are tested. Proficiency is assessed using sentence repetition (Marinis & Armon-Lotem, 2015) and picture naming (van Wonderen et al., 2017), and language exposure is estimated using a parental questionnaire (Unsworth, 2013).

Our predictions (data collection is ongoing) include the following: i) English-Dutch will produce more pre-nominal possessives than their monolingual peers, especially during the priming phase (Bernolet et al. 2013); ii) Spanish-Dutch bilinguals will produce (even) fewer pre-nominal possessives than monolinguals, especially in the

priming phase in the postnominal condition; iii) the magnitude of any priming effects will be predicted by proficiency/exposure in English/Spanish. Together, such results would provide evidence for cross-language priming as the mechanism driving CLI (or not, should no priming effects obtain).

Table 1: Possessive NPs in English, Dutch and Spanish: preferred or only option shaded

Language	Pre-nominal	Post-nominal
English	the astronaut's dog	the dog of the astronaut
Dutch	de astronaut z'n hond	de hond van de astronaut
Spanish	---	el perro del astronauta

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Constructing L2 phonetic categories: The influence of variability in neural responses during training

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Even with years of practice, adult learners tend to need more focused and targeted input to achieve native-like perception and production of second language (L2) sounds compared to children. The present study aims to clarify the neural mechanisms through which L2 perception is influenced by variability in first language (L1) sounds. Native English and native Spanish speakers completed a five-day training paradigm during which they learned to discriminate nonnative Hindi sounds. Participants underwent electroencephalogram (EEG) recordings from the scalp, baseline discrimination tasks, and training. We expected that the L1 would modulate the EEG waveform known as the mismatch negativity (MMN) after sound onset elicited in an oddball paradigm. This measure indexes early phonetic learning and previous research has shown that the waveform's amplitude can change or shift with new phonetic learning, indicating a reorganization of early acoustic and phonetic processing (see Näätänen, 2001, for a review). Importantly, we manipulated the oddball paradigm such that the frequent stimuli were variable; therefore, participants had to construct and use phonetic categories from varying stimuli (see Näätänen, Pakarinen, Rinne, & Takegata, 2004). Unlike previous studies that use the same stimulus repeated as the frequent stimuli (e.g., Tuninetti & Tokowicz, in press), varying the standard stimulus requires more naturalistic processing for using existing and constructing new phonetic categories. Results demonstrate that both learner groups showed a modulation in the MMN waveform after training, but the change was eclipsed by the native contrast that was tested as a control. These results are examined in light of the Perceptual Assimilation Model (PAM; Best, 1991, 1995), the Speech Learning Model (SLM; Flege, 1995), the Native Language Magnet model (NLM; Kuhl et al., 2008), and the Unified Competition Model (UCM; MacWhinney, 2005),

examining similarity between L1s, neural hardwiring in the brain, and competition between phonetic contrasts.

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Phonological similarity effects on lexical decision for aurally-presented Japanese-Chinese cognates by native Chinese speakers learning Japanese

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Previous studies (e.g., Hayakawa, et al., 2012; Yamato, et al., 2009; Zhang, 2017) reported that native Chinese speakers can process L2 Japanese two-kanji compound orthographic/semantic cognates faster than non-cognates. Yet, due to the great resemblance of kanji, native Chinese speakers heavily rely on orthography to process L2 two-kanji compounds. They are, in turn, likely to pay little attention to the phonological aspect of kanji compounds, resulting in misunderstanding or poor listening comprehension (e.g., Hong 2004; Ishida 1986; Song, 2002). This study examined to what extent phonological similarity can assist lexical decisions for aurally-presented L2 Japanese two-kanji compounds by L1 Chinese speakers.

Using a L2 Japanese lexical knowledge test, 60 native Chinese speakers were divided into high and low Japanese lexical knowledge groups. 250 two-kanji compound Japanese-Chinese orthographic/semantic cognates and the same number of non-words were aurally-presented for a L2 Japanese lexical decision task. A regression tree analysis (see Figure 1.) conducted on accuracies revealed five predictor variables; (1) high/low Japanese lexical knowledge groups, (2) high/low phonological similarity, (3) long/short phonological length, (4) high/low Japanese word frequencies, and (5) high/low Chinese word frequencies.

The results indicated that the strongest predictor for accuracies was Japanese word frequency: The high word frequency stimuli were significantly more accurate than the low frequency stimuli. Phonological length was the second strongest predictor: Long phonological length was more accurate than shorter phonological length. Lexical knowledge and phonological similarity were the third predictors both following phonological length. Since native Chinese speakers rely on the L2 Japanese kanji orthography, Chinese word

frequency did not affect accuracies of aurally-presented compounds. Overall, Japanese word frequency was the most crucial factor while phonological similarity appeared as a weak effect. In conclusion, due to the strong ties between orthography and concepts in kanji, native Chinese speakers establish weak connections between orthography and phonology.
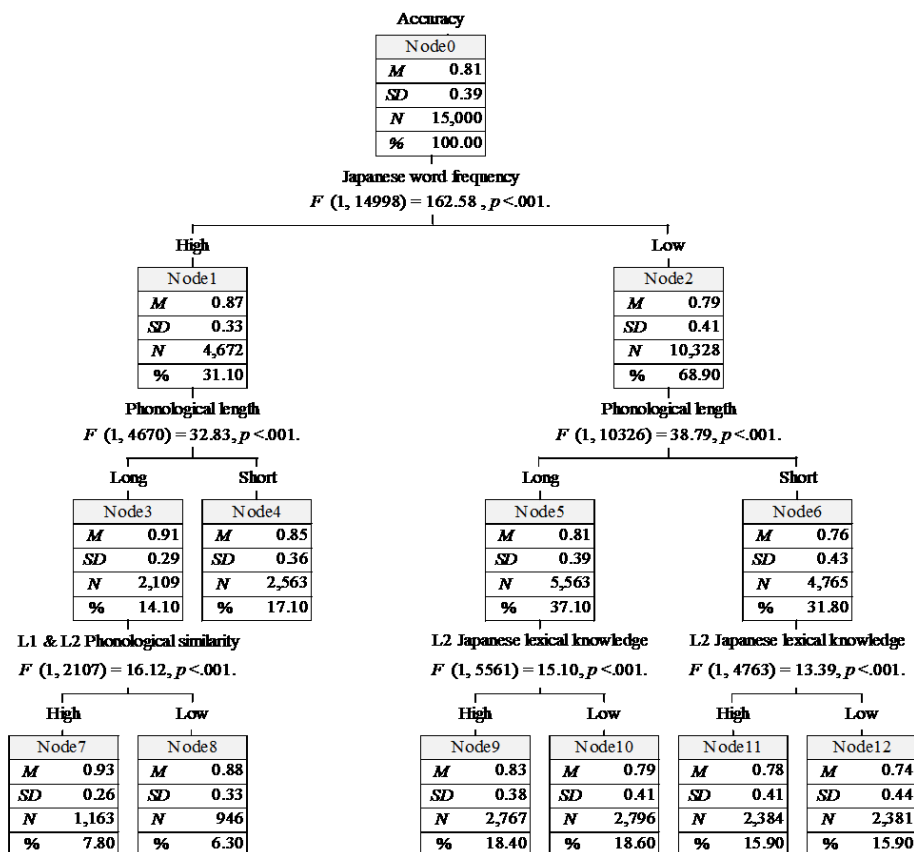
Accuracy

Node0	
M	0.81
SD	0.39
N	15,000
%	100.00

Japanese word frequency
$F\ (1, 14998) = 162.58\ , p < .001.$

High

Node1	
M	0.87
SD	0.33
N	4,672
%	31.10

Low

Node2	
M	0.79
SD	0.41
N	10,328
%	68.90

Phonological length
$F\ (1, 4670) = 32.83, p < .001.$

Phonological length
$F\ (1, 10326) = 38.79, p < .001.$

Long

Node3	
M	0.91
SD	0.29
N	2,109
%	14.10

Short

Node4	
M	0.85
SD	0.36
N	2,563
%	17.10

Long

Node5	
M	0.81
SD	0.39
N	5,563
%	37.10

Short

Node6	
M	0.76
SD	0.43
N	4,765
%	31.80

L1 & L2 Phonological similarity
$F\ (1, 2107) = 16.12, p < .001.$

L2 Japanese lexical knowledge
$F\ (1, 5561) = 15.10, p < .001.$

L2 Japanese lexical knowledge
$F\ (1, 4763) = 13.39, p < .001.$

High

Node7	
M	0.93
SD	0.26
N	1,163
%	7.80

Low

Node8	
M	0.88
SD	0.33
N	946
%	6.30

High

Node9	
M	0.83
SD	0.38
N	2,767
%	18.40

Low

Node10	
M	0.79
SD	0.41
N	2,796
%	18.60

High

Node11	
M	0.78
SD	0.41
N	2,384
%	15.90

Low

Node12	
M	0.74
SD	0.44
N	2,381
%	15.90

Figure 1: Regression tree analysis predicting accuracies of L2 Japanese lexical decision

Testing sensitivity to code-switching asymmetries in L2 sentence processing

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Spanish (L1) - English (L2) bilinguals demonstrate an asymmetry in their production of code-switched verb phrases. Prior corpus work has shown that bilinguals are just as likely to code-switch before or after the progressive auxiliary verb *estar* as in ***Los niños* [*están/are*]** *walking to the library* "The kids are…". In contrast, code-switches that involve the perfective auxiliary *haber* are heavily favored to occur after the auxiliary: ***Los niños* [**han/have*]** *walked to the library* "The kids have…". In turn, bilingual code-switchers are sensitive to these production asymmetries as reflected in reading times with eye-tracking, i.e. when analyzing the participle, no reading time differences for *estar* code-switches, but significantly different reading times for *haber* code-switches (Guzzardo Tamargo et al., 2016).

In the current study, we extend this paradigm to ask whether L1 English – L2 Spanish bilinguals are also sensitive to the same distributional asymmetries. This comparative approach will help uncover whether the distributional asymmetry is due to community-imposed (i.e., experienced-based) constraints or to structural properties of Spanish/English (Blokzijl et al., 2017), such as the grammaticalization or collocational strength of *haber,* which never appears independently. Participants read 32 experimental sentences (64 filler sentences) in which the factors **auxiliary verb** (*estar, haber*) and **switch position** (at the auxiliary, at the main verb) were crossed. Preliminary data (N = 16) on early (first fixation, gaze duration) and late reading measures (regression path, total duration) indicate no sensitivity to distributional asymmetries. Instead, L2 speakers show a general switch cost, with switches occurring at the main verb (***Los niños están* walking/*han* walked**) incurring greater reading times than switches occurring at the auxiliary (***Los niños* are walking/have walked**). However, total duration shows a tendency towards reduced

reading times for *estar* code-switches at the auxiliary (Figure 1). Data collection is ongoing with a target sample size of 32 participants.
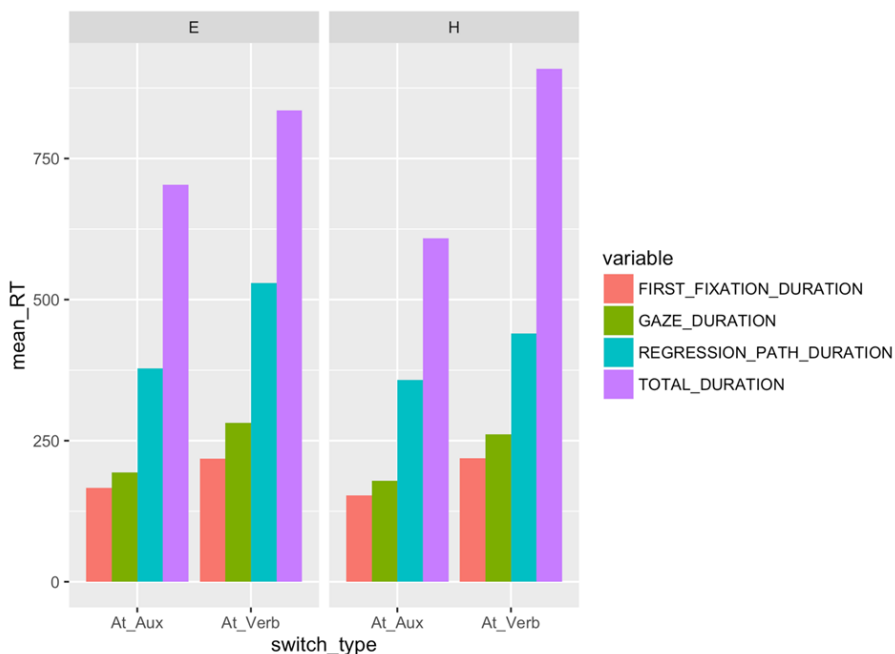

Figure 1: Preliminary reading times on the main verb (*walking*, *walked*) split by auxiliary type (E = *estar*, H = *haber*)

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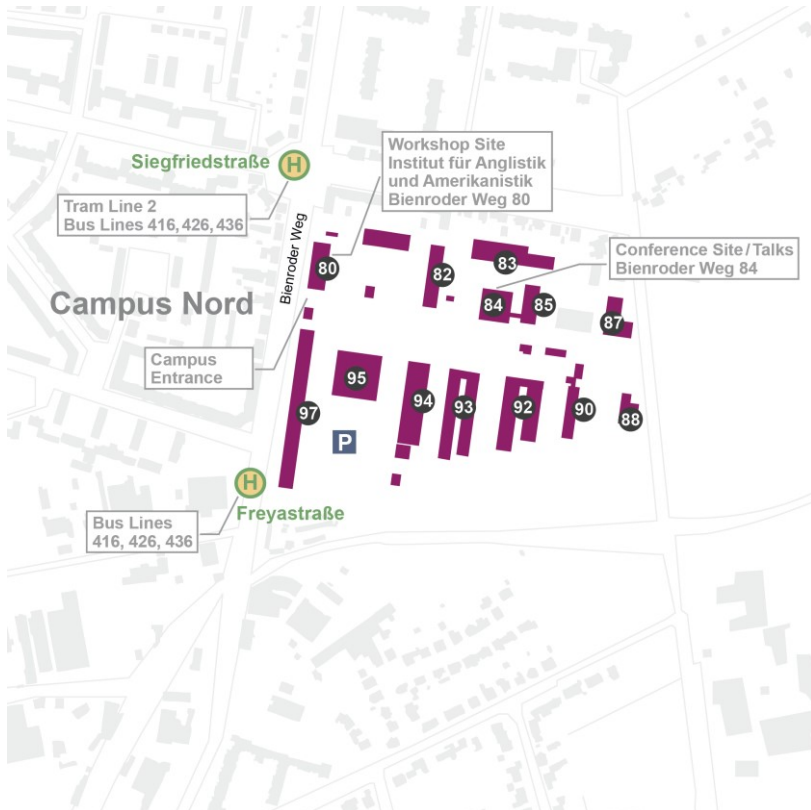sabine.zerbian@ifla.uni-stuttgart.de

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Notes

Campus Nord

(Source : SPK / TU Braunschweig)

BI 85.2

BI 85.1
Lounge

Gents upstairs

REGISTRATION

Book
display

BI 85

BI 84.1
Talks

BI 84

Poster Session

BI 83 / Sports Hall

From bus stop