Workshop on Multilingual Language Acquisition, Processing and Use

October 22-23 2022
School of Education, Communication and Society
King's College London

King's College London

Centre for Language Discourse & Communication

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- Jason Rothman
- Roumyana Slabakova
- Lari-Valtteri Suhonen
- Marit Westergaard
- Magdalena Wrembel

Academic Program

Day 1	
08:00 – 09:00	**Registration**
09:00 – 09:15	**Opening**
09:15 – 10:15	**When multilingualism is more than three: An L(3)+ study of grammatical gender** Tanja Kupisch University of Konstanz
Session 1	**Chair:** Romana Kopeckova
10:15 – 10:45	Examining the role of tone language experience for learning tones in an L3 Andrea Takahesu Tabori, Michelle Nguyen, Josue Mena and Judith F. Kroll
10:45 – 11:15	Using Jaccard Distance to measure the linguistic I-proximity of phonological inventories in a contrastive hierarchy John Archibald
11:15 – 11:45	**Coffee break**
Session 2	**Chair:** John Archibald
11:45 – 12:15	Developmental acquisition of stops by multilingual speakers Zuzanna Cal and Magdalena Wrembel
12:15 – 12:45	VOT production by L2 and L3 speakers: the role of cognates versus non-cognates Sofia Fernandez, Audrey Chery and Michael Gradoville
12:45 – 13:15	Examining the Morphosyntactic Properties of Counterfactual Conditionals in L3 Brazilian Portuguese Henry Pratt and Alison Gabriele
13:15 – 14:30	**Lunch**
Session 3	**Chair:** Yanyu Guo
14:30 – 15:00	The interaction of target language, prior languages, and structure type in the L3 acquisition of verb placement Guro Busterud, Anne Dahl and Kjersti Faldet Listhaug
15:00 – 15:30	L3 acquisition of perfective and imperfective aspect: the influence of structural similarity, L2 and L3 proficiency Lukas Eibensteiner
15:30 – 16:00	Crosslinguistic influence in L3 acquisition: Evidence from artificial language learning Natalia Mitrofanova, Evelina Leivada and Marit Westergaard
16:00 – 17:15	**Coffee break + Poster session**
17:15 – 18:15	***"Starting at the very beginning is a very good place to start, indeed"*,** **but how one does it matters and has implications for L3/L*n* Theory Testing/Building.** Jason Rothman UiT, the Arctic University of Norway & Universidad Nebrija
19:00	**Workshop dinner**
Day 2	

09:00 – 10:00	**A Bug's Life: On a Quest to Distinguish Attrition and Cross-Linguistic Influence** Lari-Valtteri Suhonen University of Borås
Session 4	**Chair:** Natalia Mitrofanova
10:00 – 10:30	Cross-linguistic interactions and development of L3 Spanish labial stops among L1-Korean L2-English speakers Jeong Mun, Alfonso Morales-Front and Cristina Sanz
10:30 – 11:00	Bilingual children with developmental language disorder have L3 learning advantages Elena Tribushinina, Betül Boz and Megan Mackaaij
11:00 – 11:30	Subcortical restructuring as a function of multilingualism Jia'en Yee, Ngee Thai Yap, Doug Saddy and Christos Pliatsikas
11:30 – 12:00	**Coffee break**
Session 5	**Chair:** Anne Dahl
12:00 – 12:30	Phase shifts in multilingual phonological development: The case of coda obstruents Romana Kopeckova, Ulrike Gut and Christina Nelson
12:30 – 13:00	What is transferred at L3 initial stages and how L3 syntax develops? Evidence from L3 Mandarin grammars Yanyu Guo and Boping Yuan
13:00 – 13:30	L3 English in the German secondary school context: longitudinal development of bilingual heritage speakers' multilingual repertoire Tugba Elif Toprak-Yildiz, Eliane Lorenz and Peter Siemund
13:30 – 15:00	**Lunch**
14:00 – 15:00	**Coffee break + Poster session**
Session 6	**Chair:** Eliane Lorenz
15:00 – 15:30	Individual differences in L3 performance at the onset of primary school: English acquisition by Catalan-Spanish bilingual children in a formal instruction setting Adriana Soto-Corominas, Marta Segura, Helena Roquet, Noelia Navarro and Yağmur Elif Met
15:30 – 16:00	Minority language students' transition from primary school bilingual programmes to regular foreign language lessons in secondary schools in Germany Anja Steinlen and Thorsten Piske
16:00 – 16:30	Mapping, analysing and operationalising multilingual student identities in the European context: Outcomes and implications for learner engagement and wellbeing Harper Staples
16:30 – 16:45	**Break**
16:45 – 17:45	**Learners' experience of Flow in Foreign Language classrooms** Jean-Marc Dewaele Birbeck, University of London
17:45 – 18:00	**Closing remarks**

Day 2	
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17:45 – 18:00	**Closing remarks**

POSTER SESSION 1 – SATURDAY

1 Impact of individual differences in ambient language diversity and cognitive control efficiency for L3 learning of Spanish grammatical gender by Mandarin-English bilinguals
Andrea Takahesu Tabori and Judith F. Kroll

2 Lexical crosslinguistic influence in L3 Spanish by Tagalog-English bilinguals
Janina Vargas and María del Pilar García Mayo

3 Acquisition of direct object clitic in Spanish as a third language
Joo Kyeong Kim

4 Cross-Linguistic influences in visual word processing: evidence of cognate effects in different-script trilinguals
Mariana Elias, Anat Prior and Tamar Degani

5 L3 acquisition of Quebec French (QF) tense and lax vowel contrast by L1 Mandarin-L2 English learners: a contrastive hierarchy approach
Junyu Wu

6 Linear and nonlinear relations between input and developmental outcomes in Cantonese, Mandarin and English in multilingual 3-year-olds in Hong Kong
Ziyin Mai, Qiuyun Cai, Yuqing Liang, Jingyao Liu and Virginia Yip

7 L3 morphosyntactic sensitivity: Online versus metalinguistic processing
Nawras Abbas, Anat Prior and Tamar Degani

8 Cross-linguistic influence in L3 and L2 German
Nadine Kolb, Gustavo Guajardo, Katharina Bernstein, Natalia Mitrofanova and Marit Westergaard

9 Using a translanguaging framework to examine language production in a trilingual person with aphasia
Franziska Schulz, Katarina Antolovic, Zahra Hejazi and Mira Goral

10 CLI-induced vowel reduction in L3 Polish
Jolanta Sypiańska

11 Vowel perception in L2 and L3: Acoustic and perceptual similarity of English and Norwegian vowels to Polish vowel categories
Anna Balas, Magdalena Wrembel, Nicole Rodriquez and Weckwerth Jaroslaw

POSTER SESSION 2 – SUNDAY

12   Multilingual Development of German Grammatical Gender
     Megan Brown
13   Task Complexity and modeling as catalysts of multilingual EFL adolescents' gains in written
     production and vocabulary acquisition: an exploratory study
     Maria Vrban Pascual, Carmen Pérez Vidal and Elisabet Pladevall Ballester
14   Acquisition of noun phrases with kind reference in L3 Italian
     Eleonora Boglioni and Roumyana Slabakova
15   Do we rely on L1 or L2 when speaking in L3?
     Razan Silawi, Anat Prior and Tamar Degani
16   A longitudinal view of Mandarin-English bilingual development of L3 Spanish stop
     consonants: phonological aptitude, metalinguistic awareness and language use
     Linxi Zhang, Alfonso Morales-Front and Cristina Sanz
17   Exploring the effect of linguistic similarity in third language acquisition
     Isabel Nadine Jensen and Marit Westergaard
18   A fully combined design of the categorisation of unknown language vowels by Spanish-
     English bilinguals
     Kyle Parrish
19   Syntactic CLI in a longitudinal study on L3 Norwegian among L1 Polish – L2 English
     speakers
     Sylwiusz Żychliński, Anna Skałba, Magdalena Wrembel, Kamil Kaźmierski
20   Predictors of foreign accentedness in L3
     Magdalena Wrembel, Jarosław Weckwerth, Nicole Rodriguez, Katarzyna Dziubalska-
     Kołaczyk and Zuzanna Cal
21   Negative concord items in Catalan as an additional language: the case of speakers of L1
     English, L1 Italian and L1 Portuguese
     Ares Llop, Anna Paradís, Eloi Puig-Mayenco
22   The Multilingual Picture Database
     Jon Andoni Duñabeitia, Ana Baciero, Kyriakos Antoniou, Mark Antoniou, Esra Ataman,
     Cristina Baus, Michal Ben-Shachar, Ozan Can Çağlar, Jan Chromý, Montserrat Comesaña,
     Maroš Filip, Dušica Filipović Đurđević, Margaret Gillon Dowens, Anna Hatzidaki, Jiří Januška,
     Zuraini Jusoh, Rama Kanj, Say Young Kim, Bilal Kırkıcı, Alina Leminen, Terje Lohndal, Ngee
     Thai Yap, Hanna Renvall, Jason Rothman, Phaedra Royle, Mikel Santesteban, Yamila Sevilla,
     Natalia Slioussar, Awel Vaughan-Evans, Zofia Wodniecka, Stefanie Wulff, & Christos
     Pliatsikas

Keynote speakers and abstracts

1. Tanja Kupisch (University of Konstanz)

When multilingualism is more than three: An L(3)+ study of grammatical gender

L3 acquisition research tends to focus on three languages of multilingual learners. A closer look, however, might reveal that participants know additional languages (L+), whose influence on the newly acquired language can arguably be discarded due to low proficiency or dialects status. However, the potential effects of L(3)+ have not been investigated systematically, so far. Herein, we present a study on lexical gender transfer. The L1 German participants have acquired English as $L2_1$ at school, French as $L2_2$ and Italian as $L2_3$ (some with additional Latin). They are now exposed to nouns in French Provencal, $L2_4$, which bear obvious similarities with French, Italian, or both, so participants can guess the meanings of these nouns. Their task is to assign lexical gender (feminine or masculine) to them. In this setting, participants have three potential transfer sources: German, French, Italian, arguably also English. Numerous factors, linguistic and non-linguistic, can be relevant. Besides recency and proficiency, these include at least gender (mis)matches with the translation equivalents in previously acquired languages, the structural distance/similarity between these nouns (measured by Levenshtein distance), and knowledge of the genders in the background languages. Results show clear effects of structural similarity, some effects of proficiency and multilingual strategies that are all but surface transfer. Results are discussed in terms of current L3 models.

2. Jason Rothman (UiT, the Arctic University of Norway & Centro de Investigación Nebrija en Cognición, Universidad Nebrija)

"Starting at the very beginning is a very good place to start, indeed",
but how one does it matters and has implications for L3/L*n* Theory Testing/Building .

In this talk, I will discuss the importance of various types of "solid bases" in the linguistic study of grammatical transfer in adult third language acquisition and their knock-on implications for studying third language development. These range from the importance of predictive theoretical models, the value of focusing on initial stages in development, various factors related to task design and population selection, inclusive of problematizing what it means to be bi- /multilingual on the "-lingualism" spectrum. I will show some examples from recent empirical studies in our lab that underscore the importance of this discussion, inclusive of a systematic review of studies available through 2019 (Rothman, González Alonso & Puig-Mayenco, 2019) and recent work using neuroimaging methods. The overarching picture is intended to help lead the field to better common standards for testing hypotheses and increased comparability across studies.

3. Lari-Valtteri Suhonen (University of Borås)

A Bug's Life: On a Quest to Distinguish Attrition and Cross-Linguistic Influence

While the notion of multi-directionality (Sharwood-Smith, 1989) is not new, research has primarily focused on overt, forward CLI. Gradual changes in underlying representations (e.g., Ameel, Malt, Storms & Van Assche, 2009) do not necessarily manifest themselves in production. Studying such changes longitudinally has been attempted (e.g., Suhonen, 2020), but few systematic investigations comparing forward and reverse CLI in the same population longitudinally exist. Data collection for multiple years is warranted by non-linear development in immersed language acquisition (e.g., Linck, Kroll & Sunderman, 2009; Opitz, 2013). One theoretical starting point for such an endeavor could be Higby and colleague's (2020) proposal of modeling *direct* and *indirect* frequency effects. This keynote attempts to describe and distinguish the various components of conscious and unconscious lexical activity (e.g., acquisition, attrition, cross-language activation, cross-linguistic influence, direct and indirect frequency effects, convergence, inferencing, and introspection) that may take place over the course of L3 acquisition multi-directionally.

4. Jean-Marc Dewaele (Birbeck, University of London)

Learners' experience of Flow in Foreign Language classrooms

The concept of flow was introduced by Csíkszentmihályi (1990) and refers to a consciousness that is harmoniously ordered where thoughts, actions, and emotions become well-coordinated in performing a challenging task. Despite a growing interest in foreign language (FL) learner emotions that started with Dewaele and MacIntyre (2014), the topic of flow is still under-researched in applied linguistic research. Flow matters because it is addictive and has strong motivational qualities (Piniel & Albert, 2019, Dewaele Albakistani & Kamal Ahmed, 2022). This presentation will give an overview of the latest research on the topic.

Practical information

- The workshop will take place on Strand Campus (WC2R 2LS). People should use the main entrance, which is right next to St Mary Le Strand Church.
- The workshop itself will take place on the second floor of the King's Building (adjacent to the Strand building).
- Registration will be in the large Sommerset room and the talks will take place in the Nash lecture theatre.
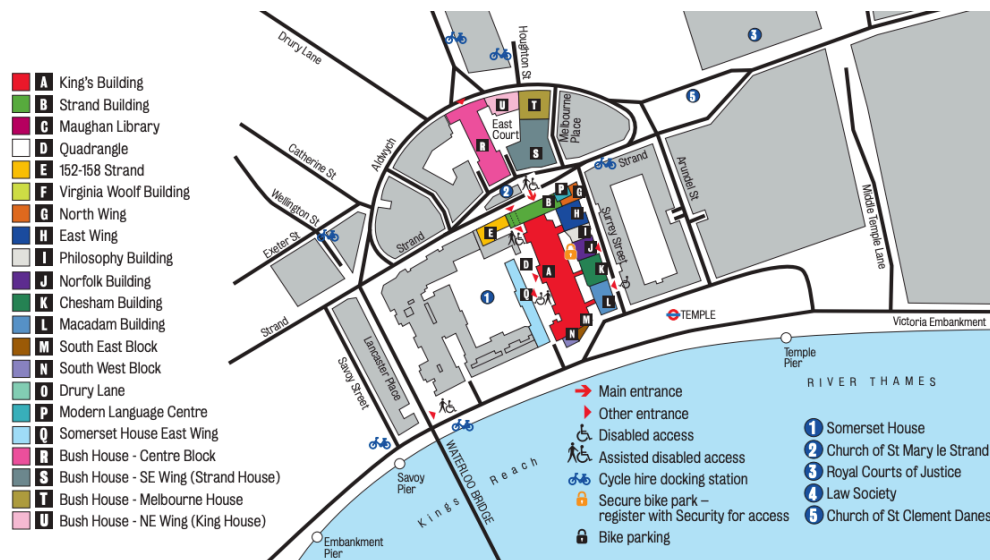
Wifi

- You can connect to Eduroam using your home institution details. If you have it set up in your devices, it should also work on campus.
- If Eduroam does not work, you can connect to The Cloud, which is a free network. You will have to register but it is free and it takes 2 minutes.

BOOK OF ABSTRACTS

*Abstracts are ordered following the order of presentation.

Examining the role of tone language experience for learning tones in an L3
Andrea Takahesu Tabori[1], Michelle Nguyen[2], Josue Mena[2], and Judith F. Kroll[2]
[1] MGH Institute of Health Professions; [2] University of California, Irvine

Background: Research with monolingual adults shows that the phonemic inventories and phonetic cues relevant the L1 influence the ability to perceive phonetic distinctions in a new language (Iverson et al., 2003). In the current study, we investigated how differences L1 features impact speech perception of tone in a third language (L3) in bilinguals.

Method: Vietnamese-English (n = 28), Bantu-English (n = 20), Spanish-English (n = 25), and Dutch-English (n = 22) bilinguals with no prior Mandarin knowledge were asked to identify Mandarin tones in an online experiment. Vietnamese has a tone system that is similar to that of Mandarin because it uses the same two tonal cues as Mandarin (pitch height and pitch direction). On the other hand, Bantu languages are more dissimilar because they only use one of the tonal cues from Mandarin (pitch height). The Spanish and Dutch groups were nontonal language control groups. In the pitch perception task, participants heard syllables with one of the Mandarin tones and had to classify them as level, rising or falling. They also completed the Simon task (cognitive control) and a survey about language and musical experience. In assessing the role of the L1, we controlled for musical experience, which has been previously found to influence pitch perception (Perrachione & Wong, 2007) and cognitive control ability which has been found to influence speech perception (Lev-Ari & Peperkamp, 2014).

Predictions: If it is experience in attending to pitch that supports the perception of tones in a new language, then we might expect: (1) L1 tone language speakers (Vietnamese and Bantu) to perceive Mandarin tones more accurately than nontonal language L1 speakers (Spanish, Dutch). However, if it is experience in attending to target language relevant cues in the L1 that facilitates the learning of another tone language, we might expect Vietnamese speakers to distinguish Mandarin tones more easily than the other three groups who have no knowledge of a tonal language that has contour tones (Spanish, Dutch, Bantu). Higher levels of musical experience should predict better tone identification in Mandarin (Bowles et al., 2016).

Results: As predicted, Vietnamese speakers were the most accurate in identifying the Mandarin tones relative to speakers of nontonal languages. However, L1 speakers of Bantu languages, which are tonal but have a more dissimilar tone system to that of Mandarin, were less accurate in identifying Mandarin tones than even speakers of nontonal languages (Figure 1). These findings suggests that L1 tone system similarity facilitated L3 speech perception, but dissimilarity interfered with it. Higher levels of musical experience also predicted higher Mandarin tone identification, but only for Spanish and Vietnamese groups (Figure 2). Cognitive control ability did not predict tone identification. These findings are consistent with the claim that speech L2 perception is largely influenced by tuning to L1 phonetic cues and with previous research showing that experience tracking pitch in music confers benefits to tracking pitch in a linguistic context.

Figure 1. Model predicted probabilities of accurate Mandarin identification by group (controlling for musical experience and cognitive control ability).
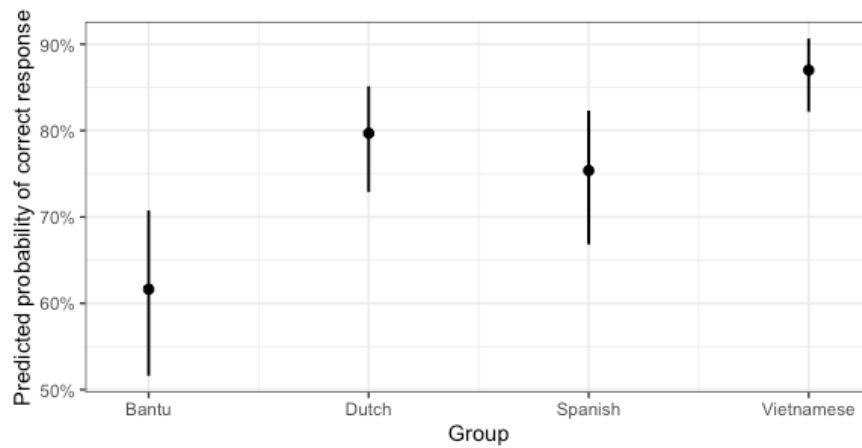
Figure 2. Predicted probability of accurate Mandarin tone identification by level of musical experience and by group.
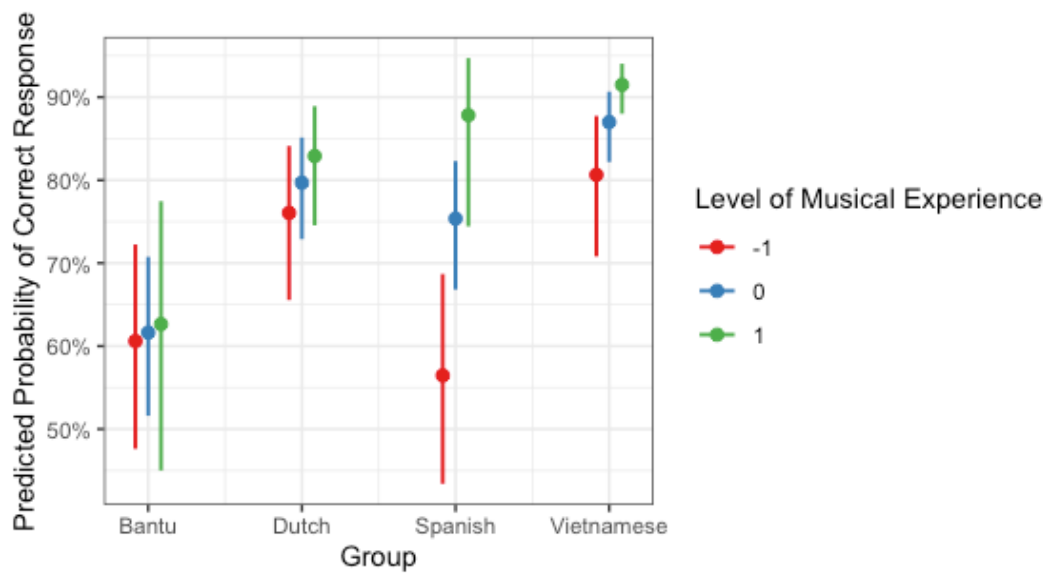
Notes. For Level of Musical Experience, -1 means 1 SD below each group's mean level of musical experience, 0 is each group's mean level of musical experience, and 1 is 1 SD above each group's mean level of musical experience.

Using Jaccard Distance to Measure the Linguistic I-Proximity of Phonological Inventories in a Contrastive Hierarchy

John Archibald, Department of Linguistics, University of Victoria

Models of third language acquisition (L3A) such Rothman (2015) and Westergaard (2021) rely on cross-linguistic comparison to predict first language (L1) versus second language (L2) transfer into the L3. Rotham argues that the typologically closest language will transfer in its entirety, while Westergaard argues that the closest linguistic structure will transfer whether it be from the L1 or the L2. What the field lacks is a way of reliably measuring linguistic similarity or proximity.

In the phonetic domain, cross-linguistic comparisons proceed segment-by-segment (Flege & Bohn, 2021) whereas much of L2 phonological research has demonstrated that L2/L3 phonology reveals *inventory* effects. In order to understand L2/L3 phonology, we need to look at the whole inventory not just individual vowels. Munro and Derwing (2008) showed that Mandarin learners of English vowels had trouble with the vowels [ɪ,ɛ,æ,ʌ,ʊ] vowels (a natural class under feature theory). Dresher's (2009) Contrastive Hierarchy (CH) model of phonology is well-suited to formalizing the notion of cross-linguistic similarity, and can be used productively to predict and explain the property-by-property transfer witnessed in L3 grammars. The CH has been used to successfully account for L1A (Bohn & Santos, 2018), historical change (Oxford, 2015), and morphosyntax (Cowper & Hall, 2019). Figure 1 shows how a 3-vowel system might have different underlying phonological structure in different languages. Finnish (in 1a) ranks the feature [round] above [back] while Quebec French (in 1b) ranks the feature [back] above [round]. Thus, a language is defined by both the features *and* their ranking. Using this type of model, we can explain the inventory effects such as Munro & Derwing (2008). Following Wu (2021) the CH for Mandarin vowels is given in Figure 2. If we apply these L1 features to English vowels we get the parse shown in Figure 3. Note that the feature hierarchy cannot uniquely define the vowels [ɪ, ɛ, æ, ʌ, ʊ]; an inventory effect explained by phonological features. But what the field needs is a way to compare inventories (or hierarchies) such as English versus Mandarin. In this paper, I explore using Jaccard Distance (Purnell, Raimy & Salmons, 2019) to do so. The formula is shown in Figure 4. If both sets are identical then the Jaccard distance equals 0; if there are no common elements then Jaccard distance equals 1. Archibald (2022) reanalyzed Benrabah's (1991) data to explain why learners transferred French vowels (and not Arabic vowels) into their L3 English. Jaccard Distance allows us a way to formalize these comparisons:
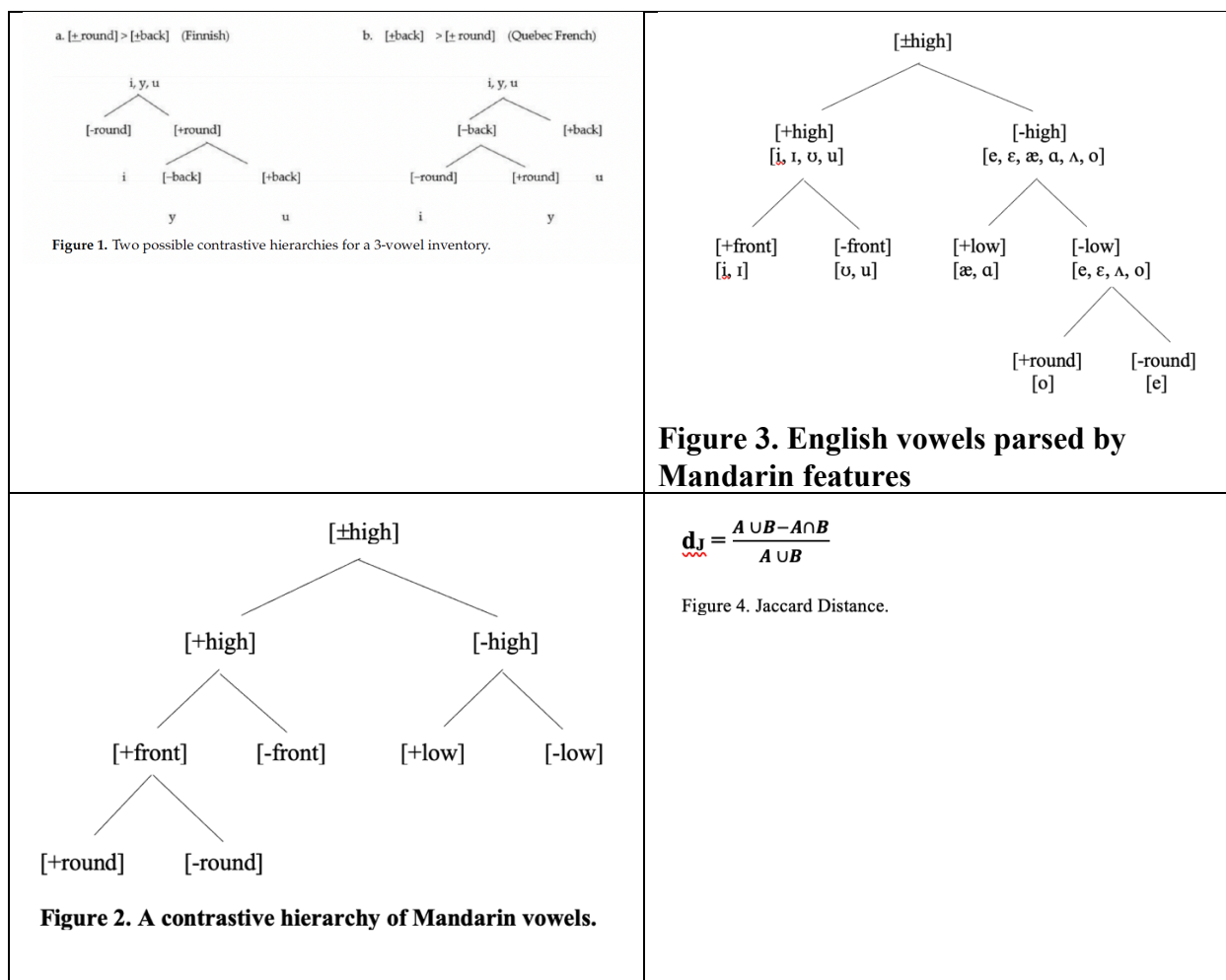
Distance (identical = 0):

Arabic:English = (11-1)/11 = .9
French:English = (24-9)/24 = .6
Mandarin:English = (17-3)/17 = .8

In the vocalic domain, French is the closest to English, then Mandarin, then Arabic. Jaccard Distance involves comparing *sets* not *members* of sets and thus allows us to compare phonological inventories as well as explain the property-by-property transfer shown in Archibald (2022a,b). However, when we look at the consonantal inventories we see cases where the Jaccard Distances are equal but the French inventory produces more parsing failures than the Arabic inventory. I conclude that parsing success is a more feasible metric than Jaccard Distance with which to measure I-proximity.

Figure 1:

a. [±round] > [±back]   (Finnish)

i, y, u
[-round] i
[+round] → [-back] y, [+back] u

b. [±back] > [±round]   (Quebec French)

i, y, u
[-back], [+back] u
[-back] → [-round] i, [+round] y

Figure 1. Two possible contrastive hierarchies for a 3-vowel inventory.

Figure 3:

[±high]
[+high] [i̯, ɪ, ʊ, u]
[-high] [e, ɛ, æ, ɑ, ʌ, o]
[+front] [i̯, ɪ]
[-front] [ʊ, u]
[+low] [æ, ɑ]
[-low] [e, ɛ, ʌ, o]
[+round] [o]
[-round] [e]

Figure 3. English vowels parsed by Mandarin features

Figure 2:

[±high]
[+high]
[-high]
[+front]
[-front]
[+low]
[-low]
[+round]
[-round]

Figure 2. A contrastive hierarchy of Mandarin vowels.

Figure 4:

$$d_J = \frac{A \cup B - A \cap B}{A \cup B}$$

Figure 4. Jaccard Distance.

References

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Developmental acquisition of stops by multilingual speakers

Zuzanna Cal and Magdalena Wrembel
Adam Mickiewicz University, Poznań, Poland

The acquisition of stops by multilingual learners has been gaining a lot of attention for some time now. To date, L3 literature has focused largely on the voiceless series of stops (e.g., Sypiańska 2013, Wrembel 2015, Llama & Lopez-Morelos 2016, Amengual 2021), yet more recent investigations also include voiced counterparts (e.g., Gabriel et al. 2018, Geiss et al. 2021). However, the area that remains largely unexplored concerns the developmental aspects of the acquisition of stops by multilingual learners over time, especially assuming a holistic perspective that looks into interactions between all three languages. This study aims to fill this gap by analysing the production of plosives by L1 Polish – L2 English – L3 Norwegian speakers at the early stages of learning their L3 throughout three testing times. The main objective is to investigate whether early-stage multilingual learners keep their categories apart while they advance in their L3 proficiency and to trace the development of VOT acquisition in all three languages in both series of stops (/p,t,k/ and /b,d,g/).

The current contribution is part of a larger scale longitudinal study and reports on the data collected across three testing times (T1, T2, T3). Participants included speakers of L1 Polish, L2 English, L3 Norwegian, aged 21, who were first year students of Norwegian Studies at two Polish universities. At T1, the participants had been learning L3 Norwegian intensively for eight weeks. The speakers performed a reading task of three word lists separately for each language including stop tokens in stressed onset positions controlled for the vocalic context. The participants were presented with stimuli on a computer screen in language blocks on separate days. The obtained sound files were force-aligned using WebMAUS (Kisler et al. 2017), and the VOT boundaries were manually corrected in Praat (Boersma & Weenink 2021). The VOT durations were then extracted with the use of Praat script (Lennes 2002). The participants were asked to complete the Language History Questionnaire (Li et al. 2006) and proficiency tests in L2 and L3.

A factorial ANOVA was run to investigate the differences in VOT durations, with language, place of articulation (PoA) and voicing as fixed factors as well as interaction effects between the factors. Statistically significant main effects were found for language (F=19.887, p<.001), PoA (F=113.101, p<.001) and voicing (F=15129.211, p=.000), as well as for interaction between PoA*Voicing (F=7.074, p<.001). A Borferroni post hoc test revealed significant differences between all three PoA and languages. These results indicate that the trilingual learners show unique VOT patterns for each of their languages and PoA, which suggests that they keep their L1/L2/L3 systems apart. The results show that VOT durations for L3 Norwegian stops are in-between those produced in Polish and English for voiceless series while they approximate Polish values for voiced stops. Ongoing investigation with comparison to T2 and T3 will allow to track the development of VOT acquisition patterns in L3 learners.

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VOT production by L2 and L3 speakers: the role of cognates versus non-cognates

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Research in the area of third language (L3) phonology has been recently growing, but it is still scarce when compared with the acquisition of second language (L2) speech (Cabrelli Amaro & Wrembel, 2016). The current study investigates the production of Voice Onset Time (VOT), as it presents significant individual variation (Cabrelli Amaro, 2012), to establish how different groups of learners (English-French vs English-Spanish-French) produce the VOT of French /ptk/ depending on their prior linguistic experience. When evaluating VOT values, this study focuses on the production of cognates versus non-cognates. Amengual (2012) explains that those lexical items that show an overlap in terms of semantics, phonology, and orthography may affect the degree to which monolingual-like phonological contrasts are maintained. For instance, the author conducted a study where participants produced more English-like VOT values in Spanish when producing cognates when compared to non-cognates. Furthermore, when focusing on Spanish, it is essential to distinguish between heritage (HL) and L2 speakers. Given that HL speakers learn both English and Spanish in naturalistic settings, their Spanish VOT values have a tendency to more closely resemble those of native Spanish speakers than do Spanish L2 VOTs (Llama & López-Morelos, 2016). Generally speaking, English /ptk/ present long-lag voicing (aspirated production), while Spanish and French /ptk/ manifest with short-lag voicing (unaspirated production) (Llama et al., 2010). Recent studies have shown that L3 speakers tend to produce either L1-accented speech (E.g., Llama & Cardoso, 2018), L2-accented speech (E.g., Hammarberg, 2001), or they create a hybrid system (E.g., Kupisch et al., 2014).

All participants in this study were enrolled in the first course of elementary French at a university in the Southwestern United States. Participants were divided according to the following classifications: English native/Spanish heritage with French as their additional language; English native/Spanish L2 with French as their L3; and English native/French L2. Participants completed a language background questionnaire and a production activity where they read aloud word lists in the previously mentioned languages. Each participant completed the production activity in the languages they reported knowing. The word lists contained real target words that included voiceless stops /ptk/: 36 words per language, half cognates, and half non-cognates. A short production activity in the form of questions was completed between languages to reduce non-target language activation.

The main goal of analyzing VOT values was first to evaluate if L3 and L2 speakers create distinct phonological categories across languages, especially when distinguishing between cognates and non-cognates. The second objective consisted in determining whether having Spanish as a HL or L2 might impact the production of French. A linear mixed-effect model was used to analyze the data. The three groups consistently distinguish VOT between the three languages with French VOT averaging as slightly longer than Spanish VOT, but much shorter than English VOT, indicating that they are distinguishing their phonological categories, albeit with possibly non-target-like French VOT. We find no consistent effect for cognate status on the data. We will discuss further avenues for research related to cognates in L3 phonology.

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Acquisition of the Morphosyntactic Properties of Counterfactual Conditionals in L3 Brazilian Portuguese

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We examine the acquisition of verbal morphosyntactic properties in counterfactual conditional sentences by four different learner groups of Brazilian Portuguese (henceforth B.P.): L1 English / L2 B.P., L1 English / L2 Spanish / L3 B.P., L1 Spanish / L2 B.P., and L1 Spanish / L2 English / L3 B.P. Following recommendations of the *Typological Primacy Model* (TPM, Rothman, 2011) and the *Linguistic Proximity Model* (LPM, Westergaard et al., 2017), our study includes both the L1-L2 'mirror' design and the comparison of L2 vs. L3 groups with a common L1. The study investigates whether there is wholesale transfer from Spanish, in line with the *TPM*, or property-by-property transfer from both languages, in line with the *LPM*.

The study focuses on the morphosyntactic properties of both clauses of counterfactual conditional sentences (as in 1/2), properties observed to be difficult in the L2 literature (Botero, 2016). We examine whether previous knowledge of Spanish or English can facilitate acquisition of specific constructions for L3 learners. In the *if*-clause of counterfactual conditional sentences, B.P. requires the main verb to be inflected in the past subjunctive (1a/1b). B.P. shares this overt mood distinction with Spanish, but not English. In the *then*-clause, B.P. has both a synthetic conditional (2a), similar to Spanish, and an analytic conditional (2b) unlike Spanish, but similar to English ('would solve'). Thus, knowledge of Spanish can facilitate acquisition of the past subjunctive (1a/b) and the synthetic conditional (2a) in B.P., but can lead to incorrect rejection of the analytic conditional (2b), a context where English may facilitate. All participants completed an acceptability judgment task in B.P. (60 targets/36 fillers) and a B.P. proficiency test; L3 participants were also tested in their L2.

Results: B.P. natives showed high d-prime scores for all three grammaticality distinctions as expected (Figure 1). We then divided learners with up to (Figure 2) or more than (Figure 3) one year of exposure to B.P. The L1 Spanish / L2 B.P. group was an outlier, showing less clear distinctions in both B.P. (Figures 2/3) and Spanish (not shown). **Subjunctive:** L1 Spanish / L2 English / L3 B.P. learners were the most native-like up to 1 year of acquisition. Knowledge of Spanish led to greater distinctions for English natives past 1 year of acquisition, but not before 1 year. **Synthetic Conditional:** Both L3 groups with knowledge of Spanish significantly outperformed the L1 English / L2 B.P. group, both below and above 1 year of acquisition. **Analytic Conditional:** All groups under-accepted the analytic conditional compared to other properties, both below and above 1 year of acquisition. **Discussion:** There is evidence of facilitation from Spanish. Spanish seems to boost performance on synthetic conditionals for both Spanish and English natives. For the subjunctive, this 'boost' from Spanish takes longer to appear for English natives than Spanish natives. There is no clear evidence of transfer from English for the analytic conditional; however, the relatively lower performance across groups for this property could also be due to limited exposure in the input compared to other properties.

Target Sentence Conditions: Past Subjunctive

1a)	Eu	passa-ria	nessa	matéria	se	eu	**estuda-sse**	essas	páginas**.**
	I	pass-COND.1SG	in.this	course	if	I	study-IPFV.SBJV.1SG	those	pages

1b)	*Eu	passa-ria	nessa	matéria	se	eu	**estuda-va**	essas	páginas**.**
	I	pass-COND.1SG	in.this	course	if	I	study-IPFV.IND.1SG	those	pages

'I would pass this course if I studied those pages.'

Target Sentence Conditions: Conditional

2a)	Se	você	segui-sse	as	instruções,	você	**resolve-ria**	o	problema.
	if	you	follow-IPFV.SBJV.3SG	the	instructions	you	solve.COND.3SG	the	problem

2b)	Se	você	segui-sse	as	instruções,	você	**ia**	**resolver**	o	problema.
	if	you	follow-IPFV.SBJV.3SG	the	instructions	you	would.AUX.3SG	solve.INF	the	problem

2c)	*Se	você	segui-sse	as	instruções,	você	**resolve**	o	problema.
	if	you	follow-IPFV.SBJV.3SG	the	instructions	you	solve.PRES.IND.3SG	the	problem

'If you followed the instructions, you would solve the problem.'

Results

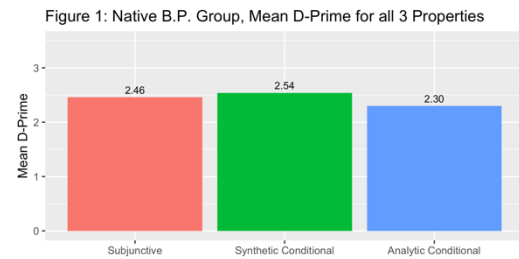Figure 1: Native B.P. Group, Mean D-Prime for all 3 Properties

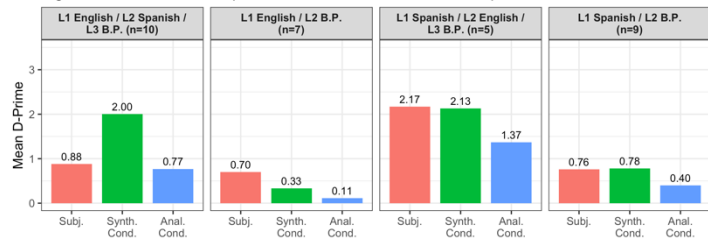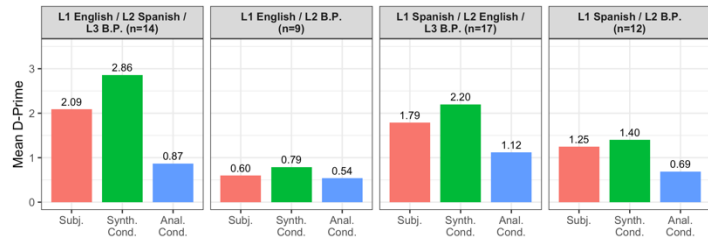Figure 2: Non-Native Groups, Mean D-Prime at ≤1 Year of Acquisition

Figure 3: Non-Native Groups, Mean D-Prime at >1 Year of Acquisition

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The interaction of target language, prior languages, and structure type in the L3 acquisition of verb placement

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We investigated patterns of cross-linguistic influence (CLI) in placement of lexical verbs in L1 Norwegian learners with L2 English acquiring L3 German or French. In main declarative clauses, lexical verbs move to C in Norwegian and German (V2 word order), to I in French, and they remain *in situ* in English. Previous research has found transfer of both V2 and non-V2 in similar language combinations (Bohnacker, 2006; Håkansson et al., 2002; Stadt et al., 2016, 2018a, 2018b, 2020a, 2020b).

L3 learners of German (N=154) or French (N=125) in their first, second, fourth of fifth year of L3 study (age 16-17) completed a written acceptability judgment task in both L2 and L3. The task included topicalized declaratives (TOP; 1a-d) and subject-initial declaratives containing short adverbs (ADV; 2a-d) with verbs in second or third position, respectively. We calculated *discrimination scores* for each structure type by subtracting each participant's mean score on non-target items from their mean score on target items.

Findings show acceptance of both V2 and non-V2 for all structures, i.e., no indication of wholesale transfer of either previous language. However, French learners discriminated more clearly between target and non-target word orders in TOP compared to ADV, while the opposite pattern was found for the German learners. Across both L3s, discrimination between target and non-target word orders was clearest for TOP in French (see Figure 1).

Our results can be explained in part by the fact that target-like performance for some of the structures is compatible with two possible underlying analyses. For TOP in French, surface structure is compatible with an analysis with short movement (to I) but also one without verb movement. Similarly, target-like surface structure for ADV in both German and French is compatible both with verb placement in C and in I. Crucially, there is positive evidence of verb movement to C in the German but not in the French input, which may explain the less clear discrimination for French learners on ADV compared to the German learners, as French learners may be less likely to entertain a hypothesis of verb placement in C. Finally, target-like word order in TOP in German is compatible with only one analysis, i.e., verb placement in C. This may explain the German learners' less clear discrimination for this structure compared to ADV.

We further note that our results may seem to indicate a stronger role for English compared to Norwegian as a source of CLI. However, we argue that this is not a result of typology or order of acquisition, but rather indicates a preference for avoiding verb movement. English does not display verb movement in the target structures, while Norwegian does. We propose that when L3 learners have experience from previous languages with both (long) verb movement and with no movement, they may tend to default to the option with no (or shorter) movement. We thus suggest that economy interacts with other factors in determining source language for CLI in L3 acquisition.

1)   a. *On Mondays* <u>I</u> **eat** fish.   (*Topicalized element*, <u>subject</u>, **verb**)
        b. *På mandager* **spiser** <u>jeg</u> fisk.
        c. *Le lundi*, <u>je</u> **mange** du poisson.
        d. *Montags* **esse** <u>ich</u> Fisch.

2)   a. <u>I</u> *always* **eat** at 7 o'clock.   (*Adverb*, <u>subject</u>, **verb**)
        b. <u>Jeg</u> **spiser** *alltid* klokka 7.
        c. <u>Je</u> **mange** *toujours* à 7 heures.
        d. <u>Ich</u> **esse** *immer* um 7 Uhr.
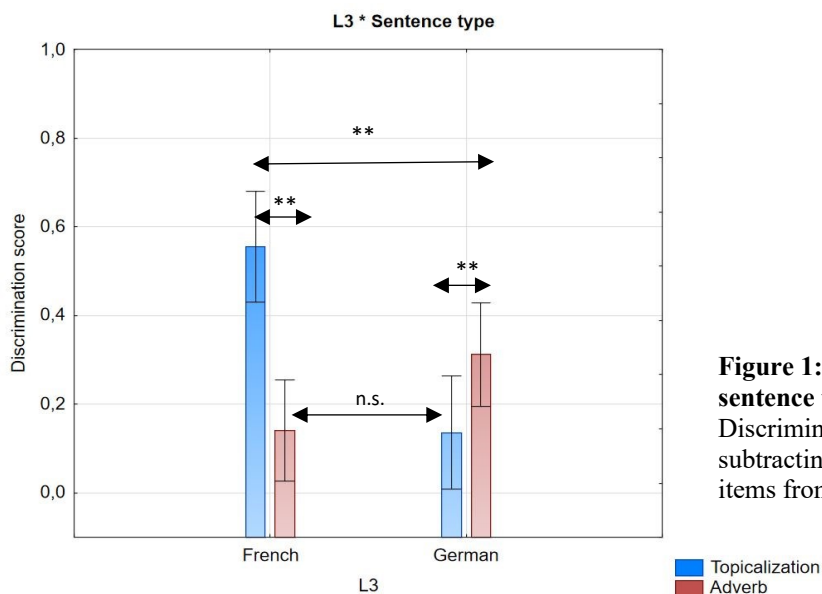
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L3 acquisition of perfective and imperfective aspect: the influence of structural similarity, L2 and L3 proficiency

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Abstract
In the last 30 years, there has been an increased interest in how previous linguistic knowledge affects L3 acquisition. It has been shown that many different factors (e.g., typology, recency, L2 status) influence the transfer process (e.g., Rothman et al. 2019). Additionally, some authors have demonstrated that the proficiency level in the L2 and the L3 plays a major role (Bardel and Sánchez 2020; Sánchez 2015). However, empirical evidence in the framework of tense-aspect-studies is still scarce. Although the influence of the L1 in L2 acquisition of Romance past tenses has been extensively investigated (e.g., Amenós Pons et al. 2019; Diaubalick and Guijarro-Fuentes 2019), there are only a few studies that have focused on the influence of the L1 and the L2 in L3 acquisition of Spanish (e.g., Eibensteiner 2019; Foote 2009; Salaberry 2005; Vallerossa et al. 2021).

In the present study, we therefore investigate the acquisition of perfective and imperfective aspect by 109 German-speaking learners of L3 Spanish with previous linguistic L2 knowledge in English. We hypothesize that form-meaning-mappings from L2 English will be transferred to L3 Spanish (German has no grammatical means to express aspect), which will result in positive transfer if the form-meaning-pairings between the L2 and the L3 are similar (i.e., in perfective and progressive periphrasis contexts). We additionally claim that positive L2 influence is related to advanced understandings of aspect in the L2 and that, in general, it will be found primarily within low levels of global L3 proficiency. Data were elicited by means of a language background questionnaire, a c-test for global proficiency measures in the L3, an oral retelling of two picture-based narratives, and two semantic interpretation tasks to measure the participants' knowledge of aspect in the L2 and the L3.

The findings provide empirical evidence for positive L2 English transfer if form-meaning contiguity between the L2 and the L3 exists (i.e., perfective and progressive periphrasis contexts). In the conditions without form-meaning contiguity (i.e., the association of the Imperfect with progressive, continuous, and habitual meanings) no positive effects were found. The positive influence of aspectual knowledge in L2 English seems therefore be related to form-meaning similarities. With regard to the influence of L3 proficiency, perfective meaning seems to be transferred already in low-intermediate proficiency levels, whereas the transfer of progressive meaning is restricted to upper-intermediate L3 levels.

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Crosslinguistic influence in L3 acquisition: Evidence from artificial language learning

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A widely discussed issue in L3/Ln acquisition is whether transfer/crosslinguistic influence (CLI) at early stages is dependent on overall typological similarity (cf. the Typological Primacy Model, TPM, Rothman 2011, Rothman et al. 2019), or whether this influence can be selectively sourced from the L1 and/or the L2 depending on linguistic property-specific similarities (cf. the Scalpel Model, Slabakova 2017, and the Linguistic Proximity Model, LPM, Westergaard et al. 2017, Westergaard 2021a, b).

For proponents of the former position, the source language is selected based on overall typological similarity to the L3, following a hierarchy of cues where the lexicon is the most salient, followed by phonology, morphology and syntax. Thus, L3 learners of French or Italian who have English and Spanish as their previously acquired languages are expected to transfer the Spanish grammar wholesale at the initial stages (Rothman & Cabrelli-Amaro 2010). The LPM and Scalpel model, on the other hand, argue that CLI is due to co-activation of both previously acquired grammars. This means that, while superficial similarity may have an effect very early in the learning process, property-by-property structural similarity should be an important factor from early on.

Focusing on this issue, we designed a picture-sentence matching task employing a mini-artificial language as an L3. We followed the subtracted language groups design and tested two groups of participants: Norwegian-English and Norwegian-Russian bilinguals (n = 23 for each group). The L3 was constructed using Norwegian lexical roots combined with case marking suffixes, as in Russian. After a short training phase, where the participants were exposed to correct examples of both SVO and OVS sentences (see examples 1-2), they were asked to decide if similar sentences accurately described pictures on a screen. Stimuli were correct/incorrect SVO and OVS sentences (see examples 3-6). Incorrect sentences used the wrong case (NOM on the object or ACC on the subject).

Our predictions were the following (see Figure 1): If lexical similarity prompts transfer from Norwegian for both groups (as per the TPM), no difference between the groups was expected. However, if case-licensed flexible word order can be selectively supported by any previous language (as argued by the LPM), Russian-Norwegian bilinguals should have an advantage over Norwegian-English bilinguals, who have no case-marking language in their repertoire.

As shown in Figure 2, our results show a higher accuracy for the two critical conditions for the Russian-Norwegian group, indicating that these learners are sensitive to the structural similarity between the L3 and Russian at an early stage, even though the L3 is lexically similar to Norwegian. This supports models of L3/Ln acquisition which assume that CLI is property by property from either or both previously acquired languages and that structural similarity is an important factor.

In this talk we also report on a follow-up study with Norwegian-Greek bilinguals (n=20), which tested whether this influence is dependent on the L3 structure in question being morphologically similar to the previously acquired language or whether a more abstract similarity has the same effect, more specifically whether case in the previously acquired language has to be marked as suffixes (as in Russian – and the L3) or whether case on prenominal articles (as in Greek) is sufficiently similar to the L3 to cause CLI. Our results indicate that in a situation of reduced exposure (10 training items), abstract structural similarity alone (not enhanced by similarity in the overt realization of the property) is not enough to trigger a facilitative effect in the acquisition of grammatical case: Greek-Norwegian participants performed on a par with the Norwegian, and not the Russian-Norwegian group.

(1) *Sebra-il tegner sopp-su.*
    Zebra-NOM draw mushroom-ACC
(2) *Hatt-su holder rev-il.*
    Hat-ACC hold fox-NOM
(3) *Kylling-il spiser mais-su*
    Chicken-NOM eat corn-ACC

(4) **Baker-su spiser suppe-il.*
    Baker-ACC eats soup-NOM
(5) *Laks-su spiser sel-il.*
    Salmon-ACC eats seal-NOM
(6) **Mark-il spiser fugl-su.*
    Worm-NOM eats bird-ACC

Figure 1: Predictions according to the TPM and the LPM

Picture: A rabbit finding a carrot	Case	WO	NOR	NOR-RUS NOR-GRE (TPM)	NOR-RUS (LPM)	NOR-GRE (LPM)
A. Rabbit-NOM finds carrot-ACC	correct	SVO	Accept			
B. Rabbit-ACC finds carrot-NOM	incorrect	SVO	Accept	Reject	Reject?	
C. Carrot-ACC finds rabbit-NOM	correct	OVS	Reject	Accept	Accept?	
D. Carrot-NOM finds rabbit-ACC	incorrect	OVS	Reject			

Figure 2: Accuracy scores across conditions and groups (blue arrows indicate significant differences between the groups within conditions).
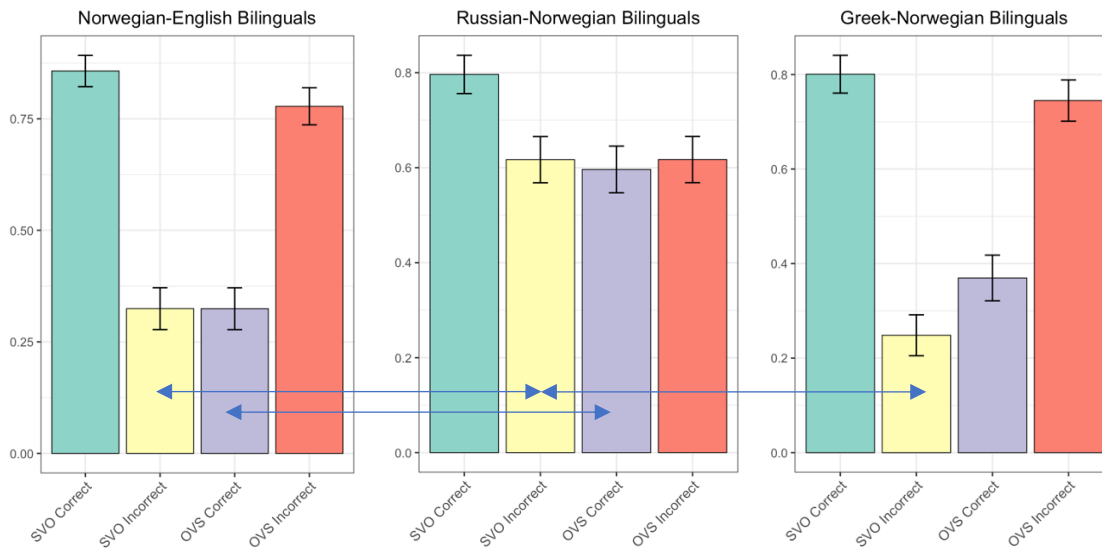
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Cross-linguistic Interactions and Development of L3 Spanish Labial Stops among L1-Korean L2-English Speakers

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Over the last two decades, there has been an increasing interest in L3 phonology (see Cabrelli Amaro, 2012; Cabrelli Amaro & Wrembel, 2016). However, the focus of research in this domain has been directed at specific stages of development (e.g., for initial stages, Llama, Cardoso, & Collins, 2010; Liu & Lin, 2021; Onish, 2016) and has independently explored either production (e.g., Llama et al., 2010; Llama & Cardoso, 2018; Tremblay, 2007; Wrembel, 2014; Wunder, 2011) or perception (e.g., Onishi, 2016; Wrembel, Marecka, & Kopečková, 2019). Another limitation that has characterized current research is the focus on Indo-European languages. To address some of these gaps and broaden the scope of the current literature, we report here findings from a study that considers both perception and production data from L1 Korean/L2 English/L3 Spanish learners at different stages of L3 learning.

Given the different configurations and cue primacy of the stop contrasts in the three languages, the study looks at developmental adjustments in voicing cues (VOT and F0 values) in L3 word-initial labial stops, /p/ and /b/. Our sample consists of 40 native speakers of the Seoul-dialect of Korean (Female: 24, Male: 16) who acquired English as their L2 at (near-) native levels and have learned Spanish as their L3. Participants completed: 1) a cross-language discrimination task and a series of identification tasks as measures of perception; 2) the different language versions of the Elicited Imitation Task (Ortega, Iwashita, Norris, & Rabie, 2002) to assess language proficiency; and 3) a wordlist reading task and a picture-naming task as measures of production.

Our findings showed that L3 learners at all levels of proficiency were quite accurate at distinguishing, specifically, the Spanish /p/-English /p/ pair and the Spanish /b/-Korean lenis /p/; however, this ability did not translate into accurate production for low-proficiency learners. For VOT, L2 English affected production of both target sounds, with effects that faded away with increasing L3 proficiency, albeit slowly in the case of /b/. For F0, no correlations were found with L3 proficiency, in general. Regarding the relationship between perception and production, significant correlations between them were observed in some cases, yet more direct links between perception and production were identified among intermediate and advanced learners.

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Bilingual children with developmental language disorder have L3 learning advantages

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One of the bilingual advantages often reported in the literature on typically-developing children involves advantages in foreign language (L3) learning at school (e.g., Hopp et al., 2019; Keshavarz & Astaneh, 2004; Maluch et al., 2015; Rauch et al., 2011; Sanz, 2000). However, it is unknown whether similar advantages hold for bilingual children with developmental language disorder (DLD). In this talk we will present two studies comparing the performance of monolingual and bilingual primary-school children with and without DLD learning English as a school subject in the Netherlands.

The participants of **Study 1** were monolingual (N=49) and bilingual (N=22) children with DLD in the last three years of special primary education (age 9–12). The bilingual participants spoke a variety of home languages. The English tests included a Receptive Vocabulary Task, a Translation Task, a Grammaticality Judgement Task and a Grammar Test. The Litmus Sentence Repetition Task (SRT) (Marinis & Armon-Lotem, 2015) was used as a measure of proficiency in Dutch (majority/school language). Samples of semi-spontaneous speech were elicited in both English and Dutch using the Multilingual Assessment Instrument for Narratives (MAIN, Gagarina et al., 2012). The narratives were analysed for grammatical accuracy, lexical diversity (N word types) and syntactic complexity (mean length of C-unit and use of elaborate noun-phrases). The results for Dutch revealed no differences between monolinguals and bilinguals on the MAIN measures, but monolinguals performed significantly better on the SRT. In contrast, bilinguals outperformed monolinguals on all English measures, except grammatical accuracy of narratives where no differences between the two groups were found.

Study 2 compared the extent of the bilingual advantage in English learners with DLD and their typically-developing (TD) peers. The participants were 69 primary-school children (Grade 4-6), including 14 TD monolinguals, 18 TD bilinguals, 24 monolinguals with DLD and 13 bilinguals with DLD. The bilingual participants spoke a variety of home languages. The test battery included the same tests as in Study 1 (except Grammaticality Judgement Task and Receptive Vocabulary Test). The MAIN narratives were analysed for fluency (N tokens), lexical diversity (N types) and complexity (mean length of C-unit). Differences in age, length of English instruction, amount of out-of-school exposure to English, verbal working memory, declarative memory and procedural memory were controlled for in the analyses. The results revealed no group differences for the Dutch narrative measures. On the Dutch SRT, monolinguals outperformed bilinguals, and TD children outperformed children with DLD. The bilingual advantage was found for all English measures, and this advantage was equally strong in TD children and children with DLD.

The results of the two studies converge: Although bilinguals have lower proficiency in the school/majority language (Dutch), they outperform monolinguals on almost all measures of L3 English proficiency. This is the first study to demonstrate that foreign language learning advantages – thus far reported only for bilingual learners with typical language development – also

hold for bilingual children with DLD. These findings contribute to the literature on cognitive advantages of bilingualism in children with DLD (Boerma, 2017; Park et al., 2019).

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Subcortical restructuring as a function of multilingualism

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Learning a language is akin to learning a skill, and subcortical structures adapt with increasing language experience and expertise (Berken et al., 2016; Burgaleta et al., 2016; Hervais-Adelman et al., 2018; Pliatsikas et al., 2017). However, the trajectory and limits of these restructuring remain unclear. In support of the Dynamic Restructuring Model (Pliatsikas, 2020), previous findings on bi/multilinguals appear to reflect a process of renormalisation where volumetric expansions that occur during the early stages of additional language learning are followed by contractions to baseline volumes upon acquiring greater adeptness at the skill (DeLuca et al., 2019; Elmer et al., 2014). We obtained T1-weighted images from 14 English monolinguals from the UK, 14 English-Malay bilinguals and 14 English-Malay-Chinese/Tamil/Japanese/Korean trilinguals from Malaysia, and 14 quadrilinguals from the Czech Republic. The volumes of five subcortical structures documented to be implicated in language control and processing were compared across the groups. The results revealed group differences for all five structures – the caudate nucleus, nucleus accumbens, putamen, globus pallidus and thalamus. Each structure exhibited complex patterns that suggest expansions and renormalisations which differ in trajectory for each group. These results highlight the dynamic process of subcortical restructuring, and more specifically supports the notion of structural renormalisation with increasing language experience.

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Phase shifts in multilingual phonological development: The case of coda obstruents

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This longitudinal study investigates the process of individual multilinguals' phonological development and explores whether this is of linear and incremental or more of a discontinuous nature. Testing some of central tenets of the Complex Dynamic Systems Theory (CDST) of language acquisition, it examines developmental changes in the realisation of (underlyingly) voiced coda obstruents in L2 English and L3 Polish of L1 German-speaking adults (aged 22-32 years) during their first year of instructed L3 learning. It is hypothesised that distinct phase transitions as important signatures of language development will be discernible in the early stages of L3 phonological learning, and that the transitions will differ in timing and shape across individuals (cf. van Dijk & van Geert, 2007).

A total of 20 weekly sessions of data collection were carried out for three participants: two females (REBA03 and ROGI18; English AOL = 11 and 10 years, respectively) who recently took Polish classes to be able to better communicate with their partners' Polish families, and one male participant (SYLÜ08, English AOL = 8 years) who took Polish before going to Poland as part of an Erasmus exchange. These learners were chosen from a larger pool of participants on a related research project because they had initially demonstrated a number of non-target-like pronunciations in both of their foreign languages, which made changes in their phonological system more likely. Concerning the phonological feature under scrutiny, the multilinguals' L2 English retains a voicing contrast in syllable-final positions, while final obstruents are devoiced in their L1 German as well as L3 Polish (Smith et al., 2009; Rubach, 1984).

A total of 1063 tokens were elicited (REBA03: n = 391, ROGI18: n = 343, SYLÜ08: n = 329) in L2 free speech and L3 delayed repetition, picture naming and free speech tasks, and analysed with respect to two selected parameters established in Smith et al. (2009) on final obstruent (de)voicing: duration of the closure portion of the final voiced obstruent (in ms), and duration of the release portion or burst (in ms). Using bootstrapping change-point analyses (Taylor, 2021), the results show that all participants evinced some phase-wise changes, although clear inter-individual differences were found. While REBA03 demonstrated fluctuations in the realisation of L2 English final obstruents during the 20-week period and made little distinction between her L2 and L3 on this phonological feature, ROGI18 and SYLÜ08 evidenced significant phase shifts in the realisation of their L3 final obstruents. ROGI18 consistently distinguished between her L2 and L3 productions in the target-like direction (English voiced consonants showing shorter closure and burst duration than Polish unvoiced consonants word finally), and SYLÜ08 increasingly so as his stay abroad proceeded. Yet, no parallel developmental changes in the production of English and Polish coda plosives and fricatives could be identified in any of the learners. The findings of the present study suggest that a multilingual's phonological development can be simultaneously continuous and discontinuous, and that their foreign language subsystems do not develop in complete alignment, at least at the beginning of additional language learning.

Results of significant change point analyses
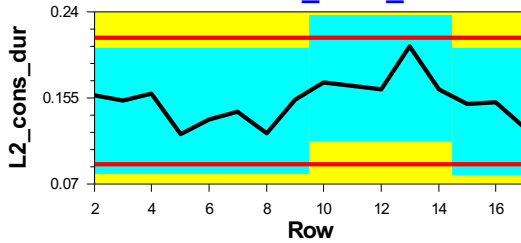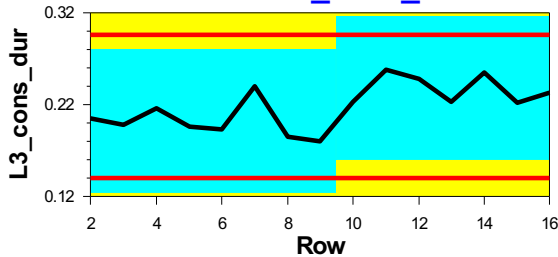
REBA03

Plot of L2_cons_dur

Table of Significant Changes for L2_cons_dur

Confidence Level for Candidate Changes = 50%, Confidence Level for Inclusion in Table = 90%, Confidence Interval = 95%, Bootstraps = 1000, Without Replacement, MSE Estimates

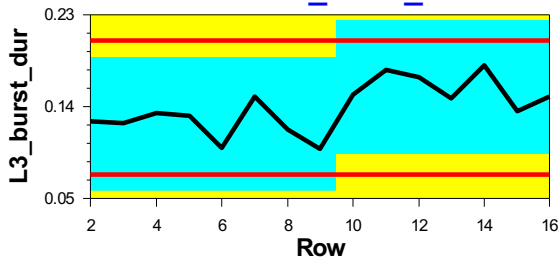| Row	Confidence Interval	Conf. Level	From	To	Level
10	(7, 10)	98%	0.14239	0.17439	1
15	(11, 15)	93%	0.17439	0.14185	2

ROGI15

Plot of L3_cons_dur

Table of Significant Changes for L3_cons_dur

Confidence Level for Candidate Changes = 50%, Confidence Level for Inclusion in Table = 90%, Confidence Interval = 95%, Bootstraps = 1000, Without Replacement, MSE Estimates

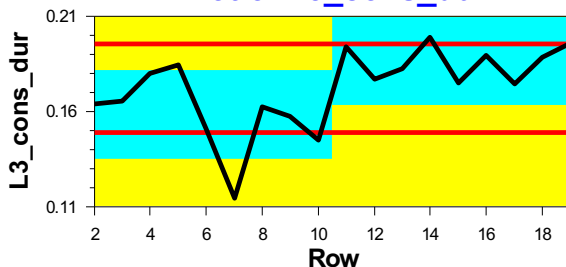| Row	Confidence Interval	Conf. Level	From	To	Level
10	(7, 13)	94%	0.202	0.23775	1

Plot of L3_burst_dur

Table of Significant Changes for L3_burst_dur

Confidence Level for Candidate Changes = 50%, Confidence Level for Inclusion in Table = 90%, Confidence Interval = 95%, Bootstraps = 1000, Without Replacement, MSE Estimates

Row	Confidence Interval	Conf. Level	From	To	Level
10	(8, 12)	97%	0.12302	0.15899	1

SYLÜ08

Plot of L3_cons_dur

Table of Significant Changes for L3_cons_dur

Confidence Level for Candidate Changes = 50%, Confidence Level for Inclusion in Table = 90%, Confidence Interval = 95%, Bootstraps = 1000, Without Replacement, MSE Estimates

Row	Confidence Interval	Conf. Level	From	To	Level
11	(3, 11)	99%	0.15854	0.18653	1

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How does L3 syntax develop? Some evidence from L3 Mandarin grammars

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Unlike most recent L3 studies, which focus on modelling transfer or cross-linguistic influence (CLI) at the initial stage(s) of the L3 (cf. Rothman, González Alonso & Puig-Mayenco, 2019; Schwartz & Sprouse, 2021; Slabakova, 2017; Westergaard, 2019), the present study is devoted to more detailed questions of what is transferred at initial stages and how the L3 syntax develops throughout the acquisition course, by investigating the L3 acquisition of Mandarin syntax by English-Cantonese bilinguals and English-speaking learners at both low and high proficiency levels.

Both Mandarin and Cantonese use sentence-final particles (SFPs) and allow multiple SFPs from different CP layers to co-occur, with some syntactic and semantic restrictions (Matthews & Yip, 1994; Paul, 2015). Three SFPs are involved in this study: *le* [+ change of state], *ba* [+confirmation seeking] and *ma* [+information seeking]. The temporal-aspectual SFP *le* must precede a question SFP on surface (e.g., [*le ba*] and [*le ma*]), because *le* locates at the lowest CP layer. The combination of [*le ba*], but not [*le ma*], has a counterpart in Cantonese, which is [*laa3 gwa3*]. The two interrogative SFPs, however, cannot co-occur ([*ma ba/*ba ma*]) because they are at the same CP layer. A fill-in-the-blank task was designed to test whether participants can form correct SFP clusters and reject illicit SFP combinations in Mandarin. A total of 174 people participated in the study, including a control group of 28 Mandarin native speakers and three types of Mandarin learners (L1 English- L2 Mandarin (EM), L1 English-L2 Cantonese-L3 Mandarin (ECM) and L1 Cantonese-L2 English-L3 Mandarin (CEM) learners) at two Mandarin proficiency levels (Low and High).

As shown in Figures 1, 2 and 3, the learner groups present different patterns in the three conditions. For the cluster of [*le ba*], the two L3 beginner groups pattern together and outperform their L2 counterparts ($p = .04$), which is strong evidence of facilitative transfer from Cantonese, the structurally more similar language. This finding supports the L3 models that proposes the source of transfer/CLI is from the typologically/structurally closer language such as the TPM and the LPM. At the high level, the L2 and L3 patterns converge ($p = .29$) although they are not native-like ($p = .003$). The other licit cluster, [*le ma*], is the easiest one for both L2 and L3 beginners ($p = .23$). No significant difference has been found between the NS pattern and the high level L2/L3 groups' patterns ($p = .38$), even though this cluster has no equivalent in either Cantonese or English. The difference observed between the acquisition results of the two licit clusters is due to structure frequency: [*le ma*] has 11821 occurrences in the CCL corpus while [*le ba*] has 7460. Regarding Type 3, the illicit combination of the two interrogative SFPs, although both the L2 and L3 groups show indeterminacy at the beginner stage ($p = .13$), the L2ers outperform their L3 counterparts ($p < .001$) and behave in a native-like way at the high proficiency level ($p = .34$). We believe that this is attributable to the complex mapping between Cantonese and Mandarin SFPs. It is very common that multiple Cantonese SFPs corresponds to one Mandarin SFP due to the huge gap between their SFP numbers, and therefore, some features and functions might be mistakenly transferred into the L3 Mandarin from Cantonese. L3 beginners who speak Cantonese tend to overuse/overproduce a certain Mandarin SFP because of a wrong mapping. Our data of the high-level learner groups show that, the unlearning of a certain structure can be more arduous than a learning process.

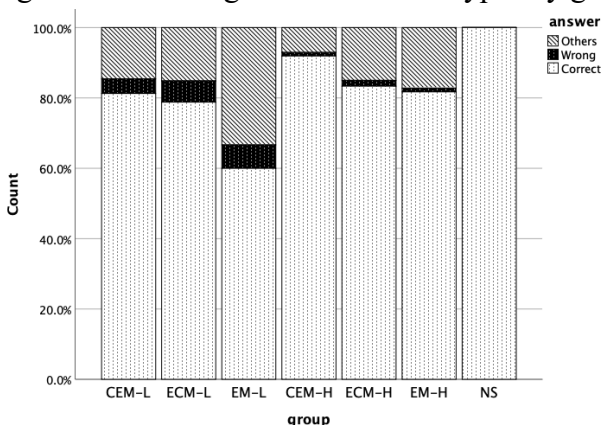Figure 1. Percentages of the answer types by groups on [*le ba*]

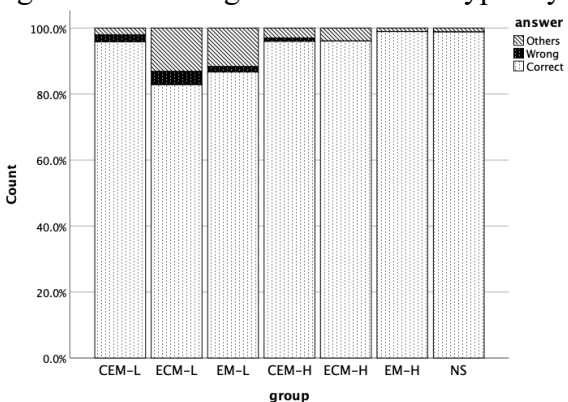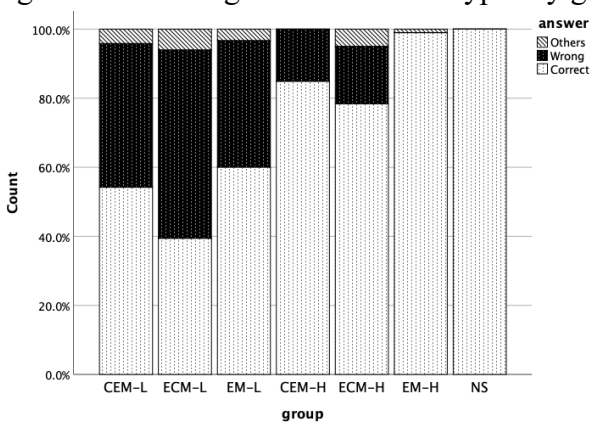Figure 2. Percentages of the answer types by groups on [*le ma*]

Figure 3. Percentages of the answer types by groups on [**ma ba/*ba ma*]

L3 English in the German secondary school context:
Longitudinal development of bilingual heritage speakers' multilingual repertoire

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Multilingual experience can be considered a significant asset. However, since the earliest studies in the field (e.g., Jones & Stewart, 1951; Peal & Lambert, 1962), the relevant literature has produced mixed results regarding potential advantages such as increased cognitive ability and metalinguistic awareness. Moreover, studies investigating the influence of bilingualism/multilingualism on the acquisition of additional languages produced partially conflicting findings (e.g., Edele et al., 2018; Hopp et al., 2019). The present study, part of a comprehensive research project on multilingual development in the German secondary school context, aims to contribute to a growing body of research examining the impact of heritage bilingualism on third language (L3) acquisition.

This longitudinal study aims to investigate i) the possible relationships among a set of linguistic and extra-linguistic factors, namely proficiency in (L2/L3) English, reading comprehension in the majority language (German) and the heritage languages (Turkish/Russian), cognitive ability, language background, socio-economic status and ii) how some of these develop or change over time. The study focuses on three waves of data collection carried out between January 2016 and July 2017. We rely on data gathered from 374 bilingual (Russian-/Turkish-German) and 600 monolingual (German) students (total N=974) attending grades seven to ten in eight federal states in Germany. The analyses were conducted using multiple linear regression to examine the relationships between L3 English proficiency and the above-mentioned variables. We tested a conceptual model of L3 English proficiency for each of the three measurement points separately to track longitudinal changes across several stages of additional language acquisition and investigate the strength and contribution of each variable to the model of L3 proficiency both in the general (i.e., featuring both monolingual and bilingual cohorts) and bilingual samples.

Overall, we predicted that cognitive ability remains a strong and significant predictor over time. Moreover, the impact of heritage language proficiency was expected to decrease and the influence of German proficiency to increase. This assumption was based on bilingual students' status as unbalanced bilingual heritage speakers, with German as their dominant and most frequently used language, and because German is the instructional language in schools. Consequently, we anticipated that monolingual and bilingual students converge from measurement points one to three due to the accumulated time of learning English in the German secondary school context. The results confirm the impact of cognitive ability and the influence of German proficiency on L3 English. Both are significant across the three waves, yet the impact of the latter is highest in the first wave and comparably lower in the other two waves. In addition, language background is only statistically significant in the first measurement point. Finally, the impact of heritage language proficiency on L3 proficiency is found to be merely marginally significant in the first wave but not significant in the second and third waves.

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Individual differences in L3 performance at the onset of primary school: English acquisition by Catalan-Spanish bilingual children in a formal instruction setting

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With much of the work on L3 development focused on the role of cross-linguistic influence on the development of an L3 in early childhood (Hopp et al., 2018; Sánchez, 2011), less attention has been paid to individual differences at the early stages of L3 development. An understanding of how sources of individual differences may affect L3 development in bilingual children with homogenous linguistic backgrounds is crucial in supporting multilingual development.

We investigate the development of L3-English vocabulary and grammar during the course of Grade 1 in various primary schools in Catalunya (Spain) to address three questions: 1-What is the range of abilities in L3-English at the onset of primary schooling?; 2-Controlling for the age of onset (AoO) of English, are richer English environments and a higher socioeconomic status (SES) associated with better English skills at the very onset of primary schooling?; 3-What effect does increased exposure at school have over time, once richness of the English environment, SES, and AoO are controlled for?

Participants include 167 early Catalan-Spanish bilingual children in Grade 1 (M_{age} = 6;4; SD_{age} = 0;3) from 14 different schools. Receptive lexical abilities were assessed using PPVT-5 (Dunn, 2019) and receptive grammatical abilities were assessed using the TROG-2 (Bishop, 2003). Parents provided information on maternal education (used as a proxy for SES) and the child's language history and use with an online questionnaire. Data was collected during the first and last terms of Grade 1 (Fall 2021 and Spring 2022).

Regarding RQ-1, results showed a wide range of variation in the English vocabulary and grammar abilities at Times 1 and 2 (Figures 1A and 1B), which were moderately and positively correlated at T1 (r=.717, p<.001) and at T2 (r=.623, p<.001). RQ-2 was addressed using two independent generalized linear mixed-effects regressions (GLMER; one for vocabulary and one for grammar). The fixed factors included years of maternal education, whether the participant attended extracurricular activities in English or not, and the average number of hours watching TV and reading in English per week. We included English AoO as a covariate. A random intercept was fit for school. The results of the two regressions found that the number of hours spent watching TV in English was the most robust predictor of higher performance in the two abilities (Figure 2A-2B). Maternal education was also a strong predictor of English grammar performance, and trended towards significance for vocabulary. Finally, access to extracurricular activities also predicted better performance in grammar. RQ-3 was addressed with two GLMERs. Time 2 vocabulary and grammar scores were predicted by the same set of predictors as in RQ-2, together with the participant's Time 1 score and the number of hours of English instruction at school between Times 1 and 2. It was found that once other sources of variability had been accounted for, more hours of English instruction predicted better performance for vocabulary at Time 2, but not for grammar.

Results showed that the large variation in receptive L3-English abilities at the onset of primary schooling can, in part, be attributed to variations in the proximal and distal environments children have. Decreasing exposure to the social languages (Catalan/Spanish) in detriment of English appears to benefit English vocabulary, but not grammar.
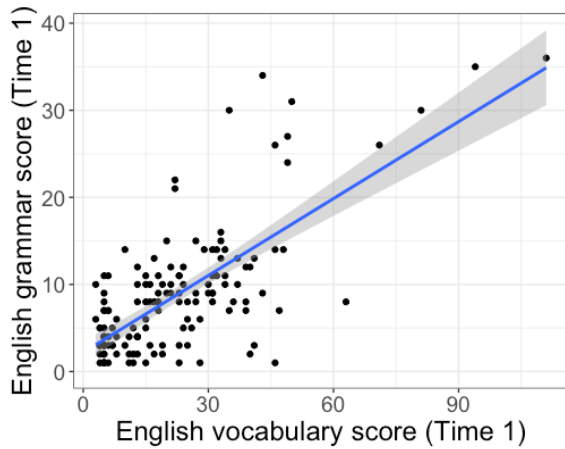
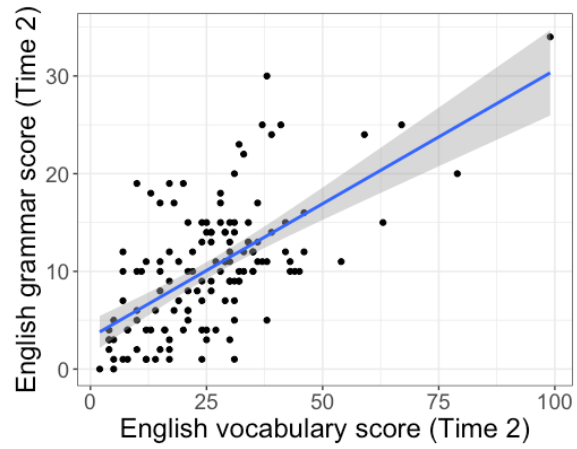Figure 1A. Participants' vocabulary and grammar scores at Time 1.

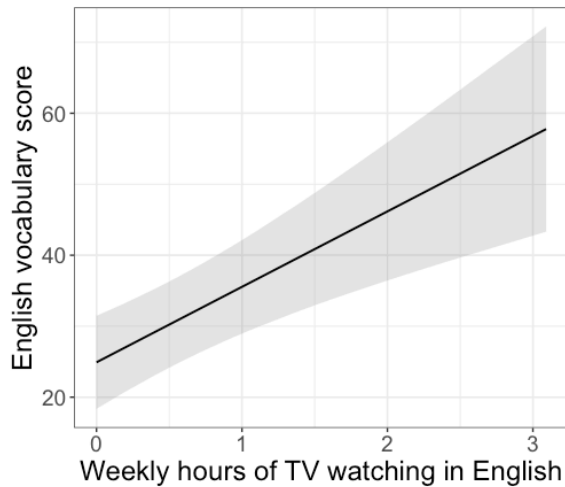Figure 1B. Participants' vocabulary and grammar scores at Time 2.

Figure 2A. Predicted probabilities of English vocabulary scores given the weekly hours of TV watching in English
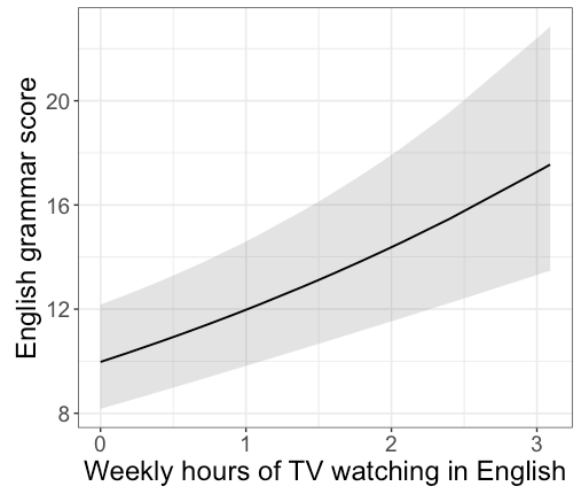
Figure 2B. Predicted probabilities of English grammar scores given the weekly hours of TV watching in English

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Minority language students' transition from primary school bilingual programs to regular foreign language lessons in secondary schools in Germany

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In Germany, the transition from primary to secondary school is regarded as very challenging for foreign language (FL) students, due to changes in teaching strategies and assessment practices and a shift from an oracy to a literacy focus, all of which may affect students' long-term FL proficiency development and success (e.g. Jaekel et al., 2021). In this study, we will explore the linguistic development and the attitudes of a particular subgroup of students, i.e., students who were enrolled in a German-English bilingual program in primary school, and who attended regular English lessons from grade 5 onwards in secondary school (Steinlen et al., i. pr.). The focus will be on minority language students who usually learn the majority language German as an L2 and English as the first foreign language taught at school as an L3. These students deserve particular attention because according to, for example, Genesee & Fortune (2014, p. 196), students from an "ethnically and linguistically diverse background [...] including minority ethnic groups" are often considered 'at-risk' students.

More specifically, we will address the following research questions: Is there a difference between students' attitudes towards bilingual learning in primary school and English-as-subject lessons in secondary school, depending on whether their L1 is German or not? Are there any differences between the L1 and L2 German students regarding their performance in English language tests in secondary school?

Our sample includes 315 fifth graders (of whom 25% have a minority language background) from more than 73 secondary schools in Bavaria, Germany. The students completed a questionnaire on their attitudes towards both bilingual learning in primary school and English-as-subject lessons in secondary school. In addition, we tested a subsample of 30 students (of whom 25% again had a minority language background) on their English reading and listening skills by using subtests of the Primary School Assessment Kit (Little et al., 2003).

Preliminary results indicate that irrespective of their language backgrounds the students rated the primary school bilingual program as well as their English-as-subject lessons in secondary school very positively. Moreover, L1 and L2 German students performed equally well in the English tests. These results support the assumption that children from ethnically and linguistically diverse backgrounds do not generally constitute an at-risk group in foreign language classrooms, because they can and, apparently, often do achieve similar results in L3 tests as their majority language peers (e.g. Steinlen, 2021).

Finally, we will discuss the results obtained in our study in the light of various models pertaining to transfer in L3 acquisition, and we will consider some practical implications of our findings for the foreign language classroom.

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Lexical Crosslinguistic Influence in L3 Spanish by Tagalog-English bilinguals

Janina Camille Vargas & María del Pilar García Mayo

Crosslinguistic influence (CLI) has emerged as a topic of interest in the field of third language acquisition (L3A) due to the increasing focus on multilingual learners. Research has considered many different issues, such as the roles of typology/psychotypology, the influence of the L2, and L2 proficiency. Thus, the present study focuses on two less-studied factors, language dominance and L3 proficiency, in the lexical CLI in the oral and written output by 52 Tagalog–English early bilinguals with Spanish as their L3. They were grouped according to their language dominance based on the findings from the Bilingual Language Profile, and according to their Spanish proficiency. The experimental tasks included a written and an oral picture description task, followed by an exit questionnaire, wherein they expressed their perception about the similarities and differences between the languages in question. Instances of lexical CLI were identified according to the classifications used in previous studies. The results suggest that language dominance is not a significant predictor of the source language of the participants' lexical CLI production. However, the results do indicate that proficiency plays a significant role in the number and type of lexical CLI production. In other words, the number of lexical CLI produced decreased as L3 proficiency increased.

Acquisition of Direct Object Clitic in Spanish as a Third Language

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Spanish, Korean, and English vary significantly with respect to how they express objects. In Spanish, referential objects can be explicitly realized as a full DP in post-verbal position. However, if they are specific referents salient in the discourse, they generally surface as a preverbal object clitic. Generally, objects cannot be null in Spanish. On the other hand, Korean is an SOV, null object language, with no object clitics. Korean allows both full DP objects and demonstrative pronouns, but when the referent is salient in the discourse, it is preferable to have a null object or to repeat the full DP rather than to substitute it with a pronoun. Lastly, English, an SVO language, strictly requires overt objects, as full DPs or pronouns if they have already been referenced, and like Spanish, they are rarely omitted. This study aims to examine the interlanguage of L2/L3 Spanish learners. Our research questions are: 1) Do L1 Korean-L2 English-L3 Spanish learners and L1 English-L2 Spanish produce object clitics in Spanish to the same extent? 2) Do L1 Korean speakers show higher acceptability for null objects than L1 English speakers?

More null objects elicited by the L1 Korean group in comparison to the L1 English group can imply higher influence from L1 Korean (L1 transfer hypothesis). If both groups demonstrate influence from English, this would be evidence of Cumulative Enhancement Model (Flynn, et al., 2004), Typological Primacy Model (Rothman, 2011; 2015) or L2 status effect (Falk & Bardel, 2011). If proclitics are relatively preferred by L1 Korean or if strong pronouns are elicited by L1 English, it could be interpreted as Linguistic Proximity Model (Westergaard, 2019). As for the second question, if there is a stronger tendency by Korean learners to accept null objects than English learners, this would be evidence for a representational problem, as opposed to a superficial, performance-based effect (see Mateu, 2015).

The experiment was conducted online, using PCIbex (Zehr & Schwarz, 2018) to administer an Elicitation Task and a Truth-Value Judgment Task (TVJT). Participants also completed a language background questionnaire and a cloze task consisting of 20 multiple-choice questions to assess their level of Spanish (based on the DELE *Nivel Intermedio*). The Elicitation Task provided participants with a short story and a picture (Figure 1), and asked them "What is x doing to y?", prompting them to use object clitics (Castilla & Pérez-Leroux, 2010). There were 16 trials, balanced for animacy and number. Participants' verbal responses were audio-recorded and later analyzed. Data from 21 L1 English learners, three L1 Korean learners, and five monolingual native speakers of Spanish have been analyzed. All participants, especially Koreans, strongly preferred full DPs, with 12.57/16 (L1 English), 14.67/16 (L1 Korean), and 12.6/16 (L1 Spanish) of such responses. There were a few clitic responses by L1 English (0.48/16) and L1 Spanish (2.8/16) speakers but none by L1 Korean speakers. Null objects were rarely produced by all groups. This shows that L2 English is more likely to be the source of transfer, rather than L1 Korean.

In the TVJT, participants were asked to judge whether the given sentence correctly describes the picture. The task was designed so that the target sentences acquired a transitive interpretation if null objects were allowed. That is, *El niño bota*, 'the boy bounces' could be accepted when matched with a picture in which a boy is bouncing a ball if the participant's grammar allows null referential objects (Grüter, 2005). The results (Table 1) show both L1 English (2.26/6) and L1 Korean speakers (3/6) tend to incorrectly accept verbs without clitics in transitive scenarios, i.e., they ignore the clitic. Furthermore, L1 English speakers falsely accept null object sentences using transitive verbs more so than L1 Korean speakers. That is, even though Koreans accept null object sentences, it may not be due to L1 transfer. It is rather likely to be the result of clitics being disregarded overall. Their responses in

the transitive scenario support this view. Both L1 English and L1 Korean speakers rejected many grammatical sentences with transitive verb and clitic.

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Figure 1. Screenshot examples of the Elicitation Task and the Truth Value Judgment Task

Table 1. Average Correct Responses in Truth Value Judgment Task. Key condition is in bold.

Sentences	Scenarios	L1 English (n = 23)	L1 Korean (n = 3)	L1 Spanish (n = 5)
Intransitive	Intransitive (True)	5.64/6	6/6	5.6/6
	Transitive (False)	**2.26/6**	**3/6**	**4.8/6**
Transitive	Transitive (True)	3.35/6	4.33/6	5.6/6

|	Intransitive (False)	4.83/6	4.67/6	5.4/6

Cross-Linguistic influences in visual word processing: evidence of cognate effects in different-script trilinguals

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Here we examine patterns of lexical cross-linguistic influences (CLI) among trilingual speakers of three completely non-overlapping orthographies (Arabic/Hebrew/English). There is currently ongoing theoretical debate over the degree to which L3 processing is influenced by representations in the L1, the L2, or both (Sanz et al., 2015; Bardel & Falk., 2007; MacWhinney, 2005). Participants in this study were 63 undergraduate university students who are native Arabic speakers (L1), are partially immersed in a Hebrew speaking environment (L2), and who learned English (L3) in a formal setting. Each participant performed a visual semantic decision task, on pairs of prime-target words in English, their L3. Prime types included double cognates (14 L1-L3 cognates and 14 L2-L3 cognates), 14 triple cognates (L1-L2-L3) and 42 control, non-cognate word. This contrast across cognate types allows us to compare the degree to which each of the languages modulates L3 processing. Of note, because the three languages do not share a script, cognates shared phonology and meaning, but not orthographic representations. Results demonstrate that targets preceded by cognate primes were responded to significantly more quickly than targets preceded by control primes ($F(1)$=8.25, p=0.005), and marginally more accurately (p=0.071) (see Figure 1). However, no significant difference was observed across the different cognate priming conditions (double vs. triple cognates) in either RT or accuracy. These findings lead to two important conclusions. First, the observed prime-type effect demonstrates that lexical CLI is not limited by either script overlap or by typological similarity across languages. Specifically, none of the languages in this study share the same script, and the two earlier acquired languages (Arabic and Hebrew) are typologically different than English (Semitic languages versus an Indo-European language). Second, the lack of a difference across the cognate conditions supports the proposal of the Unified Competition Model (MacWhinney, 2005, p. 55) that "whatever can transfer, will". Specifically, the priming evident in the Hebrew-English double cognate condition, emphasizes the role of CLI from L2, in the absence of CLI from L1, during L3 processing. To conclude, the current findings demonstrate how CLI in L3 processing can be driven by phonological form and meaning similarity even in cases of typological and orthographic differences.

Panel A
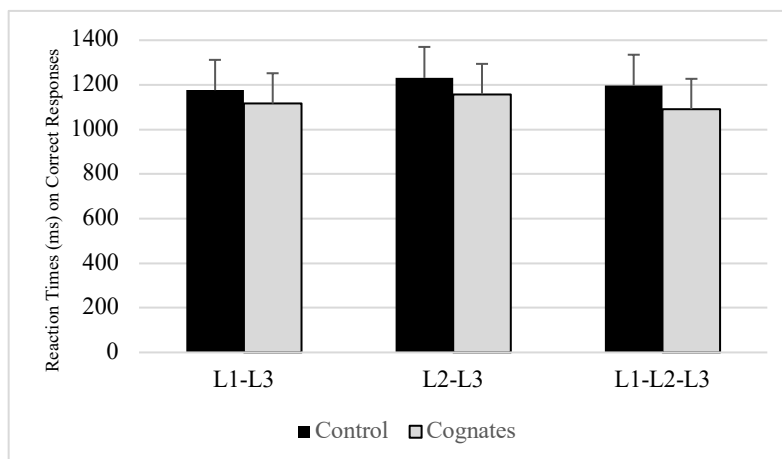
Panel B
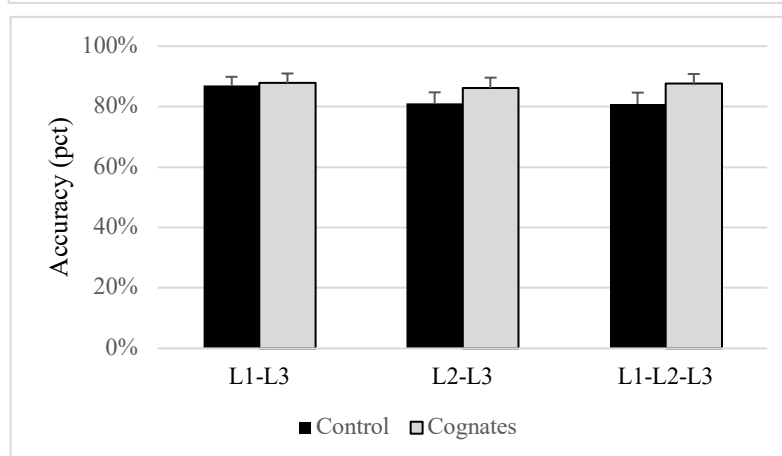
Figure 1: The effect of Prime Type on Reaction times (Panel A) and Accuracy (Panel B) (estimated means, error bars represent SE)

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L3 acquisition of Quebec French (QF) tense and lax vowel contrast by L1 Mandarin-L2 English learners: a contrastive hierarchy approach
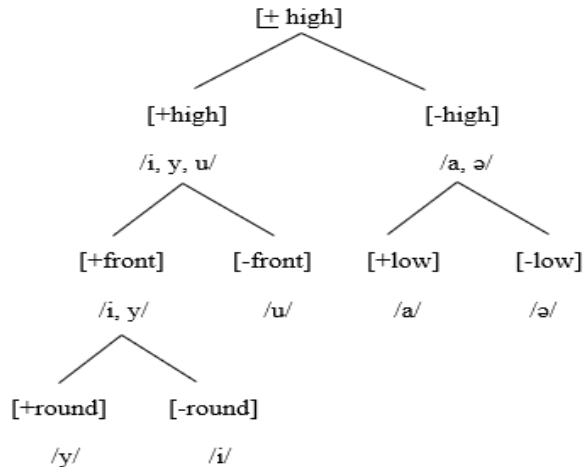
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University of Victoria

The linguistic proximity model (LPM) (Westergaard, 2021) has been widely used to explain language phenomena in L3 acquisition, mostly in morphosyntax and phonetics. However, the investigation of the LPM in L3 phonology remains a neglected area. The current study aims to add to our understanding of multilingual phonological acquisition. Specifically, I look at the L3 learning of Quebec French (QF) tense and lax vowels. My hypothesis is: Mandarin speakers will be able to select the L1 phonological features [±front] and [±round] (used to distinguish /y/ from /u/ or /i/), and the L2 English [±tense] feature (used to distinguish /i/ from /ɪ/) to acquire the L3 tense and lax vowels allophonic contrast [y, ʏ]: [ʏ] is not found in either Mandarin or English.

The phonology model I adopt is contrastive hierarchy theory, a representational and learning model proposed by Dresher (2009). According to Dresher, phoneme inventories are best understood in relation to contrastive feature specifications, assigned in language-specific hierarchies by the Successive Division Algorithm (SDA). In the SDA, features are assigned to divide the inventory into smaller binary subsets until each phoneme is uniquely specified. The selection of the features is determined in part by examining the phonological processes in a given language (Dresher, 2009).
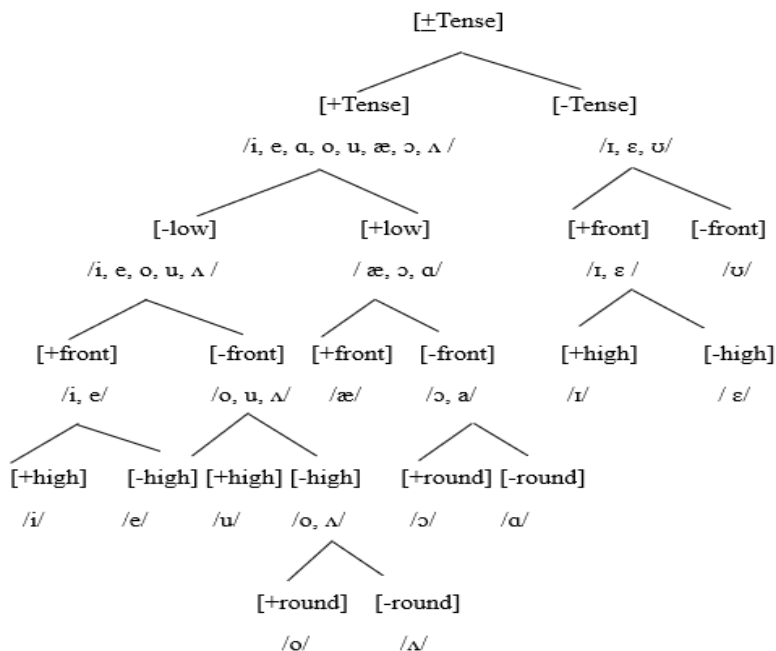
This study examines the perception of the L3 QF tense/lax vowel allophonic contrast [y, ʏ] by L1 Mandarin-L2 English learners at the high intermediate level of QF proficiency. Eleven native Mandarin speakers and seven native Quebec French speakers were recruited. The Chinese speakers' English proficiency level was measured by IELTS (average score 7.0). Their QF proficiency level was measured by a self-rated background questionnaire (intermediate and advanced levels based on instructional hours). An ABX discrimination task (with 1500ms ISI) was conducted by embedding [y, ʏ] in CVC syllables ([bVb], [bVp], [dVd], [tVd], [sVz], [zVz]) in 24 trials. Distracter contrasts including the vowels /i/-/u/ were added randomly into those trials. This yields a total of 30 trials. Using the Mann-Whiney U test, the results indicate that there is no significant difference (R = 0.25, $p > 0.32$) between the control group of native QF speakers and the experimental L3 QF group. Both groups perform above 94% accuracy: Mandarin speakers 94.3% versus QF speakers 97.0%.

In terms of potential transfer (or transfer potential), as shown in Figures 1 and 2, Mandarin has [±front] specified on rounded vowels ([±front] >[±round]) so /y/ is specified as [+front, +round]. In L2 English, [±tense] is ranked at the top of the hierarchy to differentiate tense from lax vowels (Durand, 2005). These data suggest that the bilingual Mandarin/English learners of L3 QF, transferring [±front] >[±round] from L1 Mandarin and [±tense] from L2 English, are able to successfully parse the L3 QF tense and lax vowels [y, ʏ]. Overall, my findings support the LPM's view of transfer and suggest that learners are able to select phonological features from both previous language sources to represent L3 target sounds, which is a novel finding.

(1) Mandarin vowel feature hierarchy (Wu, 2021)

```
                            [± high]
                    ┌──────────┴──────────┐
                [+high]                [-high]
                /i, y, u/               /a, ə/
          ┌───────┴───────┐       ┌───────┴───────┐
      [+front]        [-front]  [+low]         [-low]
       /i, y/           /u/       /a/            /ə/
     ┌────┴────┐
 [+round]   [-round]
   /y/         /i/
```

(2) English vowel feature hierarchy (Kwon, 2021)

```
                              [±Tense]
                      ┌──────────┴──────────┐
                  [+Tense]                [-Tense]
          /i, e, ɑ, o, u, æ, ɔ, ʌ /       /ɪ, ɛ, ʊ/
          ┌───────────┴───────────┐     ┌──────┴──────┐
       [-low]                  [+low]  [+front]    [-front]
    /i, e, o, u, ʌ /          / æ, ɔ, ɑ/  /ɪ, ɛ /     /ʊ/
     ┌─────┴─────┐        ┌──────┴──────┐   ┌────┴────┐
  [+front]   [-front] [+front] [-front] [+high]  [-high]
   /i, e/    /o, u, ʌ/    /æ/    /ɔ, ɑ/    /ɪ/      / ɛ/
  ┌───┴───┐  ┌───┴───┐        ┌───┴───┐
[+high][-high][+high][-high][+round][-round]
  /i/   /e/   /u/  /o, ʌ/   /ɔ/      /ɑ/
               ┌────┴────┐
          [+round]  [-round]
             /o/       /ʌ/
```

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Linear and nonlinear relations between input and developmental outcomes in Cantonese, Mandarin and English in multilingual 3-year-olds in Hong Kong

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Previous studies have found that in early bilingual development, the proportion of input from each of the languages in the child's total input ('input proportion') is a strong predictor of developmental outcomes in that language (e.g., Hoff et al., 2012). However, in some cases additional input beyond 50-60% does not seem to further facilitate development, suggesting non-linear input-outcome relations beyond the 50% threshold (Thordardottir, 2011; 2015). To our knowledge, little has been done to examine input-outcome relations in toddlers who are learning three languages, one of which is typologically distant from the other two.

This study fills the gap by examining input-outcome relations among 61 three-year-olds in multilingual Hong Kong. All children were born to parents who were ethnically Chinese, speaking Cantonese and/or Mandarin as their L1(s), and English additionally. The children were exposed to the three languages to varying degrees at home. By the time of our study (3;0), some had developed productive competence in only Cantonese (n = 22), others in Cantonese and English (n = 32), still others in all three languages (n = 7). Input and outcome measures were collected through parental questionnaire and the Peabody Picture Vocabulary Test (PPVT-4) administered with the child's primary English input provider, as well as the Communicative Development Inventories (CDIs) completed through individual interviews with the child's primary input provider in each language for all languages the child had developed productive competence in. Descriptive results are shown in **Table 1**.

Analysis revealed **medium linear correlations** between input proportion in a language ((1) in Table 1) on the one hand, and two or three outcome measures in the same language ((4) to (6) in Table 1) on the other. Nevertheless, two additional non-linear patterns emerged at between-subject and within-subject levels:

i) nonlinear quadratic regression models show that input proportion of a language accounts for additional 20% of the variance in CDI vocabulary score in that language after socioeconomic indictors (mother's education, family income) and input quality indicators ((2) & (3) in Table 1) are controlled for; crucially, the quadratic models are **stronger** than corresponding linear models (ΔR^2 = .175, English data shown in **Figure 1**);

ii) close-to-balanced outcomes between the two Chinese languages (Mandarin and Cantonese) in the seven trilinguals regardless of input ratio between two languages (shown in **Figure 2**); this is probably due to the 'input-poor' Chinese language (Mandarin in the cases of Kelly, Andrea, Biga; Cantonese in Claire & Wozai) profiting from positive transfer from the 'input-rich' Chinese language in catching up with the other, consistent with the input-outcome patterns found in a trilingual toddler in a longitudinal study (Leo Corpus, Mai & Yip, 2022) and also the hypothesis that typological or structural similarity plays a prominent role in language transfer in trilingual grammars (Rothman, 2015).

Caretaker-child interaction based on standard toys was also recorded; transcription and data analysis are on-going.

Table 1. Descriptive statistics of the input and outcome measures (n = 61, child age 3;0)

		Cantonese		Mandarin		English	
		Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*
(1)	Input proportion	.66	.25	.03	.12	.23	.20
(2)	Input quality composite[a]	4.91	.21	4.39	.73	3.58	.58
(3)	English input provider PPVT-4[b]	-	-	-	-	132.72	29.39
(4)	Parent-rated child proficiency[c]	4.49	.60	1.92	.84	3.61	.99
(5)	CDI vocabulary score	678.15	112.12	511.43	193.27	507.08	106.22
(6)	CDI complexity score	73.93	9.74	64.29	15.15	19.28	8.01

Notes. [a] weighted arithmetic mean based on primary input provider's self-rated proficiency and proportion of input from individual provider; [b] raw score (administered from Set 4); [c] on a 5-point scale from 1 ('cannot understand') to 5 ('can say complex sentences and respond fluently').
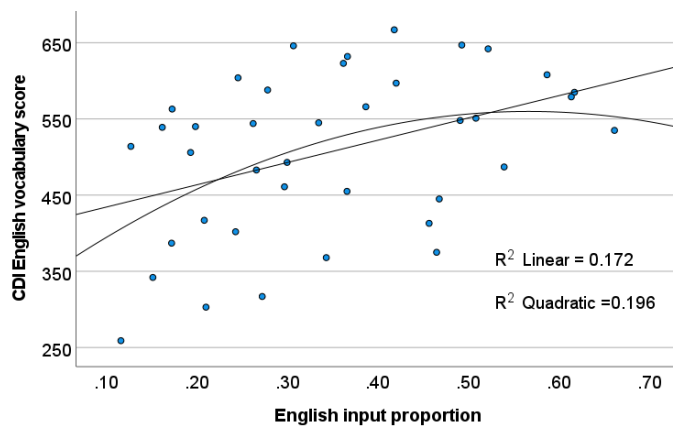
Figure 1: Input-outcome relation in English among the English-speaking children (n = 39).
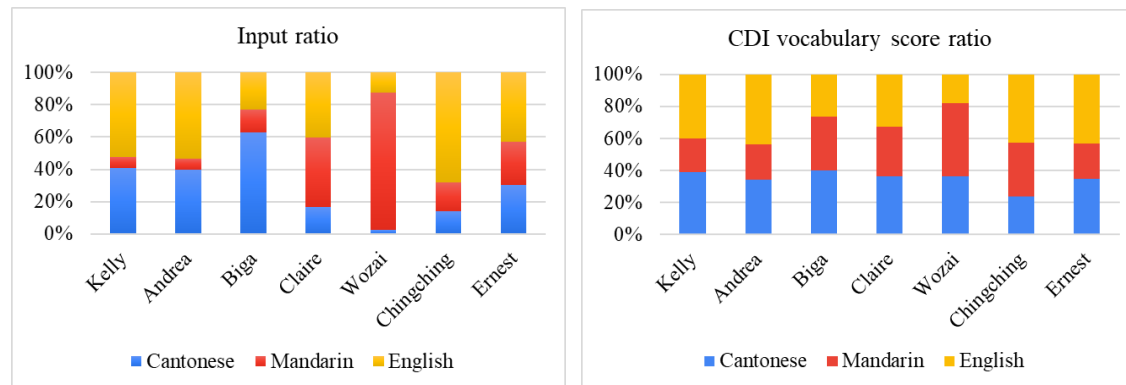
Figure 2. Input-outcome relation in the trilingual children (n = 7).

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L3 morphosyntactic sensitivity: Online versus metalinguistic processing

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The question of how adult learners process grammar in a non-native language has been investigated thoroughly in second language (L2) research, but is relatively underexplored in third language (L3) research. Here, we examine how L3 morphosyntactic processing is manifested in online versus offline measures and whether it may reveal differential effects, since the former reflects real-time and automatic processing, while and latter is open to conscious inspection and reflects overt metalinguistic decision making (Marinis, 2010). We ask, in addition whether language proficiency may modulate syntactic sensitivity.

Suggestive evidence for a possible divergence between online and offline measures comes from our previous recent work (Abbas et al., 2021) in which cross linguistic influences (CLI) among trilingual speakers were examined. In that study participants read grammatical and ungrammatical sentences that belong to different conditions of syntactic overlap while their eye movements were recorded, and then performed a post sentence grammaticality judgment. The results demonstrated dissociation patterns between the measures. For instance, interference from L1 was only marginal in the grammaticality judgment, but it was robust during an earlier measure of reading time. Nevertheless, because offline and online measures were concurrently collected, this experimental design could have influenced natural reading and activated greater metalinguistic awareness. Thus, in the current study we return to this issue with a refined design, by separating the online and offline tasks in order to maintain cleaner measures.

Thus, in the current study 104 Arabic-Hebrew-English trilingual university students are tested in their L3, English. All native Arabic speakers in Israel are trilinguals due to their social-educational context, and therefore, the current study carries the potential to be more generalizable to typical multilinguals in today's global society. Participants are native Arabic speakers who started studying L2 Hebrew (as the majority societal language in Israel) in the 2nd grade, and L3 English (as a foreign language) in the 3rd grade. To measure L3 morphosyntactic performance, we utilize recording of eye-movements during reading grammatical (n=20) and ungrammatical sentences (n=20), and a separate offline grammaticality judgment task on the same stimuli. Ungrammatical sentences included a violation of verb-time expression agreement, or of quantifier-noun agreement. We chose these structures because these are shared across the trilinguals' acquired languages, minimizing the potential influences of cross-language interference (Isurin, 2005), and have been shown to elicit comparable performance from native English monolingual speakers (Abbas et al., 2021). A comparable set of different grammatical sentences included the same grammatical constructions (see examples for experimental materials in Table 1). In addition, participants' proficiency profile in English was assessed using subjective and objective measures (see Table 2). We examine differences between online and offline L3 morphosyntactic processing of different-script trilinguals, and how these might be related to participant's proficiency in the target language.

Table 1. *Examples of experimental materials*

Construction	Grammatical	Ungrammatical
Verb-time expression agreement	Next Wednesday, Victoria and her friends will swim at the local indoor pool.	Last night, all of my friends *order a cup of coffee after dinner.
Quantifier-noun agreement	The next train will leave in ten minutes from the train station nearby.	Yesterday morning, Cathy took five *magazine from the library to read

Table 2. L*anguage proficiency assessment tasks*

Measures of Language Proficiency
- Multilingual Naming Test- MINT (Gollan et al., 2012)
- Self-rated proficiency (a modified version of the LEAP-Q, Marian, et al., 2007).

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Cross-linguistic influence in L3 and L2 German

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This longitudinal study investigates early stages of third language acquisition (L3A). At present, most L3A research focuses on cross-linguistic influence (CLI), i.e., whether properties are transferred based on linguistic proximity (e.g., Westergaard et al. 2017), typological primacy (e.g., Rothman 2015) or further factors. In our study, while also investigating CLI at initial stages, we focus on L3 development. Our research questions are (i) whether morphosyntactic properties are transferred wholesale or property-by-property, (ii) which factors lead to CLI at an early stage, and (iii) which factors determine CLI in L3 development.

The L3 German learners (N=45) who participated after 28, 94 and 146 German lessons at school are 15-17-year-old L1 Norwegian speakers with high proficiency in L2 English. Furthermore, we are currently collecting data from L2 German learners who are matched based on age at testing, length of exposure, and proficiency in German. We compare L3 German to L2 German learners, which allows us to assess whether CLI obtains from one language or both. The L2 German comparison group is restricted to native speakers of English because native speakers of Norwegian typically acquire L2 English before acquiring German and are thus not L2 but L3 learners.

We conducted an acceptability judgment task (AJT) with five conditions, two of which are structurally similar to Norwegian (adverb placement in subject-initial declaratives, V2 in non-subject initial declaratives), one to English (obligatory articles in generic contexts that allow article omission in Norwegian), one to both English and Norwegian (prenominal placement of possessive determiners, while postnominal placement is also possible in Norwegian), and one to none of the two languages (object-verb word order) (see Figure 1). We included six ungrammatical and six grammatical items per condition. A mini-AJT with the five conditions was conducted in L2 English.

In L3 German, we found a significant main effect of test time, grammaticality and condition (see Figure 2). At early stages, we found a high degree of individual variation. The early-stage data suggests that CLI occurs property-by-property and that structural similarity is a determining factor rather than lexical similarity, order of acquisition or language dominance. Accuracy is increasing significantly over time for three conditions: Possessive condition with facilitation from L1 AND L2, object-verb condition with non-facilitation from L1 AND L2, adverb condition with non-facilitation from the L2 and facilitation from the L1.

The conditions vary with regards to frequency, complexity and markedness. The increase in the object-verb condition can be explained by learning and overcoming non-facilitation from both languages due to high frequency and salience of this word order. For the possessive condition, non-facilitation from L1 Norwegian is overcome early as there is also facilitation from Norwegian (and English). For the adverb placement condition, non-facilitation from L2 English is overcome early as it may have been weakly acquired in L2 English (mean accuracy: V-Adv: 88.8%, X-V-S:

92.4%, DetN: 97.1%, PossN: 97,8%, OV: 96,4%), which is in line with Westergaard (2003), who found that this word order is acquired late in L2 English by L1 Norwegian speakers.

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| Condition	Norwegian	English	German	
Adverb Placement (V-Adv)	V-Adv (-V2) *Lisa tegner aldri bilder.*	Adv-V (+V2) *Lisa never draws pictures.*	V-Adv (-V2) *Lisa malt nie Bilder.*	GER = NOR ≠ ENG
Non-subject-initial Declaratives (XVS)	XVS (+V2) *I dag besøker Paul faren sin.*	XSV (-V2) *Today Paul visits his father.*	XVS (+V2) *Heute besucht Paul seinen Vater.*	
Det. Use in Generic Contexts (Det N)	Ø N *Jeg har hus.*	Det N *I have a house.*	Det N *Ich habe ein Haus.*	GER = ENG ≠ NOR
Possessive Det. Placement (Poss N)	Post- and prenominal *Glasset mitt er grønt.*	Prenominal *My glass is green.*	Prenominal *Mein Glas ist grün.*	GER = ENG (+NOR)
Object-Verb (OV)	VO *Marie har bakt brødet.*	VO *Mary (has) baked the bread.*	OV *Marie hat das Brot gebacken.*	GER ≠ ENG + NOR

Figure 1: Overview of the 5 conditions
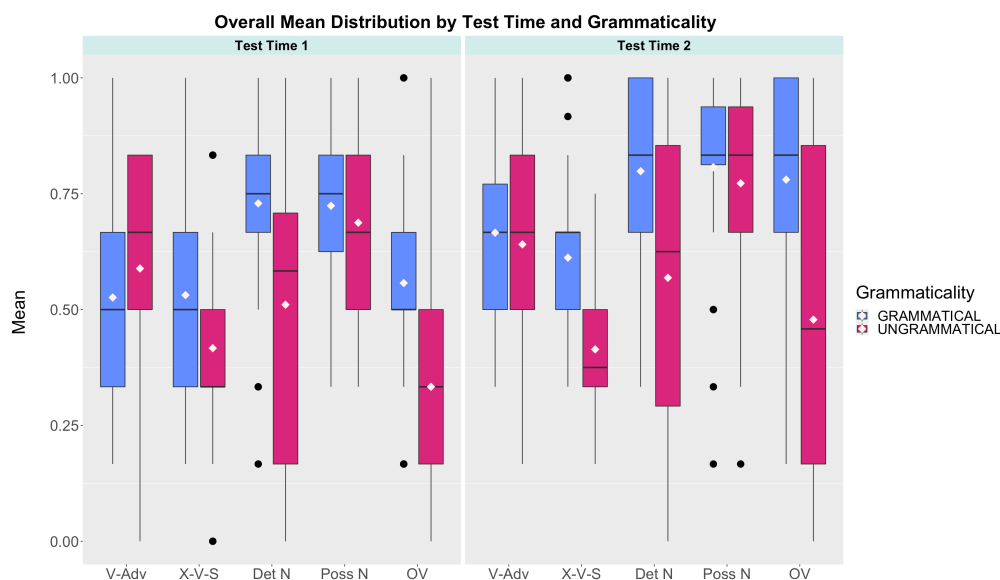
Figure 2: L3 German - Overall means by test time and grammaticality

Using a Translanguaging Framework to Examine Language Production in a Trilingual Person with Aphasia

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Multilingual individuals with aphasia - an acquired language impairment due to brain lesion – often exhibit difficulties, such as word-retrieval difficulties, in all their languages. Typically, language assessments in multilingual people with aphasia (MPWA) assess preserved and impaired abilities in each language separately. Whereas pragmatic skills of language choice are often preserved, speakers may engage in language mixing when they experience word retrieval difficulty (e.g., Goral, Norvik, & Jensen 2019). Language mixing is the norm among many multilingual people and recent approaches to studying the phenomenon include *translanguaging*, a framework highlighting the use of all languages in one's repertoire (e.g., Otheguy, García & Reid 2015). We asked whether scoring the language output of a MPWA will differ when we count accurate responses in only the target language versus when we applied a translanguaging framework, counting accurate responses regardless of the language in which they were produced.

We analyzed data from a trilingual woman with chronic aphasia. Her first language was Farsi, which she acquired at home and continued to use with her family. Her second language was German, acquired upon moving to Germany at age 6. Her third language was English, to which she was exposed briefly in early childhood and then learned as a foreign language at school in Germany. In her twenties she moved to the United States where she has been immersed in English. Following a stroke in her left cerebral hemisphere at age 28, she experienced difficulty communicating in all her languages, with English being the most preserved.

The data we report here derive from testing in her three languages. We examined data from two word-level tasks: object naming and action naming, and two sentence-level tasks: picture description and answering Wh-questions. We scored each task twice: once considering responses in the target language only and once considering responses in all languages. Our results demonstrated that overall her performance was best in English, her L3, followed by German, her L2, and least successful in her first-acquired Farsi. When tested in English, she rarely used words in her other two languages. When tested in German and Farsi, she often produced words in English, typically when she experienced word-finding difficulties. We found overall better performance when responses in all languages were considered compared to monolingual scoring. We also observed greater differences in the picture-based production tasks, especially for action naming, than in the answering Wh-questions task (see Table 1).

These findings demonstrate that when retrieval of specific target words is challenging, the participant recruited her complete language repertoire to produce a best response. However, when the task was less constrained, she attempted to use the target language and invoked her other languages less often. We interpret our results to suggest that using a translanguaging approach to assessment of language production in MPWA provides a useful measure of their communication abilities.

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Table 1

	Farsi (L1)	**German (L2)**	**English (L3)**
Action Naming (max 27)			
Correct (Target Language)	5	9	22
Correct (Either Language)	10	13	22
Object Naming (max 30)			
Correct (Target Language)	10	16	27
Correct (Either Language)	11	23	27
Sentence Construction (max 21)			
Correct Verb (Target Language)	4	8	18
Correct Verb (Either Language)	9	11	18
Correct Object (Target Language)	11	16	18
Correct Object (Either Language)	12	17	18
Accurate Description (Target Language)	2	6	15
Accurate Description (Either Language)	2	10	15
Answering WH Questions (max 18)			
Interpretable (Target Language)	12	16	18
Interpretable (Either Language)	14	18	18
Answers the Question (Target Language)	7	13	17
Answers the Question (Either Language)	9	16	17

CLI induced vowel reduction in L3 Polish

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Dominance in unbalanced bilinguals has been associated with language proficiency (e.g. Birdsong 2006) or language use (Pavlenko 2004) and may contribute to variation in production (e.g. Guion, Flege and Loftin 2000) also in the L3 (e.g. Gabriel and Rusca-Ruths (2014). In the current study, language dominance was conceptualized as a global construct based on both proficiency and use measured with the Bilingual Language Profile (BLP) (Birdsong et al. 2012). The impact of L3 proficiency on the developing L3 is said to be more noticeable at the initial stage of L3 acquisition (e.g. Hammarberg 2001; Wrembel 2010). This direction of CLI appears to decrease as L3 proficiency increases (e.g. Wrembel 2010).

The aim of the study was to investigate whether L3 Polish vowels undergo CLI- induced reduction in early unbalanced Ukrainian-Russian bilinguals and whether the reduction patterns reflect CLI from Ukrainian or Russian. Another aim was to investigate the influence of L3 Polish proficiency and language dominance in bilinguals on the source of CLI to the L3. Ukrainian-Russian bilinguals were asked to read L3 Polish words with Polish vowels /ɔ, a, ɛ, ɨ, u, i/ (N=126 tokens) in stressed and unstressed syllables in a controlled phonetic environment after /p/. The unstressed syllables were limited to the position immediately before the stressed syllable. Word-initial and word-final context were excluded. Ukrainian and Russian vowels in analogical contexts were also investigated to confirm standard pronunciation of vowels and vowel reduction in both languages.

In Russian, first degree reduction reduces the vowel system to three vowels [a,u,i] in the pre-tonic position immediately before stress (Kasatkin 2006; Kniazev and Pozaritskaya 2005). In Ukrainian the unstressed /u/ reduces to [ʊ], /ɔ/ to [o] and /a/ has an allophone [ɐ] whereas unstressed /ɛ,ɪ/ approach [e]. Polish does not reduce vowels in unstressed positions. CLI from Russian in L3 Polish would be visible in a tendency to reduce the vowel inventory in unstressed positions whereas CLI from Ukrainian should manifest by means of a tendency to centralize the unstressed vowels.

The participants were 21 Ukrainian-Russian early unbalanced bilinguals residing in Poland for 4 to 7 months prior to recording. Their language dominance was measured by means of an adapted version of the (BLP) A standardized placement test was used to establish the level of proficiency in Polish (Burkat et al. 2008) (A2, A2+ and B1 levels). The recordings were carried out in a quiet room with the use of a Røde NT1 condenser microphone attached to a computer with a Focusrite Scarlett 2i2 2Gen audio interface. The task consisted in reading the Polish words as they appeared on Powerpoint slides. The recordings were done in two sittings, one for Polish and one for Ukrainian and Russian. The vowel formants (F1,F2) were measured at vowel midpoint by means of a PRAAT script (Lennes 2003) and t-tests were run to investigate the differences between the stressed and unstressed vowels in L3 Polish.

Initial results showed a tendency to centralize the unstressed vowels by means of both formants rather than reduce the vowel inventory. The results will be further investigated in the search for influence of language dominance and L3 proficiency. The analysis of data from a Polish native speaker control group will allow to measure the exact extent of vowel reduction.

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Vowel perception in L2 and L3: Acoustic and perceptual similarity of English and Norwegian vowels to Polish vowel categories

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This study attempts to compare L2 English and L3 Norwegian vowel assimilation to L1 Polish vowel categories. The perceptual similarity is juxtaposed with acoustic similarity, and lip rounding and duration are examined as factors which may potentially skew the perception results.

Previous research has been dominated by the focus on the L2: perceptual assimilation patterns (Best and Tyler 2007, Tyler et al. 2014), and the relationship between vowel perception and acoustic parameters (Escudero, Simon, Mitterer 2012). In the present contribution we broadened the scope to cover L3. We contrasted perceptual similarity and acoustic similarity operationalized as the Euclidean distance. The hypothesis claims that the smaller the Euclidean distance between two vowels, the bigger the likelihood of assimilating a given English/Norwegian vowel to a Polish category. We also incorporated lip rounding and duration differences as the factors which are likely to influence the assimilation patterns.

24 subjects with L1 Polish, L2 English and L3 Norwegian, (mean age 19.86), who learned English as L2 (for 12.23 years on average) and Norwegian as L3 for two months in an instructed setting, participated in the study at the first testing time, which constitutes the main focus of the analysis. 15 participants retook the test after five months and 14 participants -- after nine months. They were asked to assimilate 10 English and 16 Norwegian monophthongs embedded in nonce words /dVd/ to six Polish vowel categories (orthographic labels, as Polish vowel orthography is transparent) and rated their goodness of fit on a 7-point Likert scale. We examined the relationship between assimilation rates of English/Norwegian vowels to each Polish category, and the Euclidean distance between the reference vowels for Polish (Weckwerth and Balas 2019) and the English/Norwegian vowels presented in the perception experiment.

The analysis using a negative binomial model for count data (the number of times a given non-native vowel was assimilated to a Polish category as response variable) has shown that the larger the Euclidean distance, the fewer assimilations are predicted. The hypothesis concerning the influence of lip rounding and duration differences on assimilation has not been confirmed. A stronger effect of the Euclidean distance has been found in L3 than in L2. A mixed effects linear model of Likert rating as a function of centered and standardized Euclidean distance, language and their interaction (with a by-participant random intercept) has shown that the larger the Euclidean distance, the lower the goodness ratings and that English vowels are rated higher than Norwegian vowels. Further research will be needed to determine whether the latter result is due to unfamiliarity with L3 vowels or the presence of marked front and central rounded vowels in Norwegian. The predicted effect of the Euclidean distance on assimilation count in both languages was the strongest at the first testing time. The conclusion for L3 phonology is that perceptual targets are largely modulated by the Euclidean distance, but they are influenced by other phonetic features and the perceptuo-acoustic similarity patterns are restructured during the first year of L3 learning.

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Multilingual Development of German Grammatical Gender

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While examination of CLI of grammatical gender in a trilingual context remains in its infancy, research to date on the subject focuses exclusively on early stages of L3/Ln acquisition (i.e. Brown, 2020; Długosz, 2022; Ecke, 2022). This project examines multilingual CLI of grammatical gender at later stages of L3/Ln development, and how this relationship between the languages if a multilingualchanges as German proficiency increases.

The project involved a German grammaticaly judgement task in the form an online Qualtrics survey (Qualtrics, 2022), which was made openly available online, German students of all proficiently levels and langauge backgrounds were encouraged to participate. The key questions of the task related to grammatical gender, and participants also completed a German noun gender assignment task, LexTALE vocabulary tests in German (Lemhöfer & Broersma, 2012) as a measure of proficiency and the multilingual LEAP-Q sociolinguistic background questionnaire (Marian, Blumenfeld, & Kaushanskaya, 2007).

The data set included responses from 90 participants for whom German was their L2, L3, L4 or L5. 30 of these participants had no knowledge of any other gendered langauges besides German. While, unsurprisingly, a series of mixed effects logistic regression models consistently found German proficiency to be the best predictor of success in identifying German grammatical gender errors, a variety of other factors were found to impact participant responses, even for participants with high German proficiency. These factors included the number of other gendered languages known by the participant, age of German acquisition, and knowledge of linguistics. The findings emphasize the critical value of extensive linguistic background information in multilingual research.

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Models as WCF: their impact on L2 writing

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WCF is the response a teacher, a researcher or a peer provides a writer in reaction to an error and it involves depth of linguistic processing which may account for subsequent L2 learning via the process of restructuring their interlanguage (Santos et al., 2010). Such effects would seem to stem from the Depth of cognitive processing (DoP) they entail. Modelling is a type of Corrective Feedback (CF) which triggers noticing and has been proved to positively affect learner progress (Hanaoka, 2006a; 2006b; 2007). The current study analyzes the effect ofa written task on progress in written production (immediate effects) and vocabulary acquisition (immediate and delayed effects) through a task-based modeling treatment seeking to trigger noticing. We have applied a pre-test/post-test design in order to examine gains following a a narrative of a cartoon story. To that end, around 20 Catalan/Spanish bilingual EFL adolescent learners (aged 15) have completed the task in one session taking over 60' minutes. In Stage 1 participants write the first version of their written production on the basis of a visual prompt. In Stage 2 a Target Like (TL) model is presented to them and 2 types of noticing are prompted: a Guided Modelling (GM) where they compare, classify and reflect on the differences between their production and the model and an Unguided Modelling (UM) where they only read the model and noticing is not articulated. In stage 3, participants re-write a second version of their written texts, no longer having the TL model nor their notes (in GM and UM).

Given that the depth of understanding of the noticing in the GM condition is higher, we expect for it to trigger more progress in both written production and vocabulary acquisition compared to the UM condition. Finally, we expect modeling to have an immediate effect on vocabulary acquisition while retention is not expected to occur.

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Acquisition of noun phrases with kind reference in L3 Italian

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UK university students learning Italian as a foreign language often have previous knowledge of another Romance language (e.g., Spanish). These learners can potentially rely on the L1 and L2 grammars to parse the L3 input. Spanish and Italian share lexical and structural similarities. One such domain concerns the expression of generic meaning. Generic descriptions can refer to all the species members (kind reading: *Tigers are becoming extinct*) or instances of a species being involved in habitual events (characterizing reading: *Lions roar*) (Krifka et al., 1995). Importantly, the syntactic realization of both generic meanings varies crosslinguistically and depends on the presence or absence of determiners. Whilst English bare plural subjects can have kind/characterizing readings (Chierchia, 1998; Dayal & Sag, 2020), Spanish and Italian generic subjects require definite articles (Longobardi, 1994). Hence, Spanish and Italian pattern similarly in this respect. Nonetheless, Spanish and Italian pattern differently in another construction. Spanish allows bare singular objects with number neutral interpretation in a restricted verb class (e.g., *Tengo coche*), where the object refers to one or more car(s) (Espinal, 2010). To express this meaning, English and Italian require overt determiners. Thus, for each property, two of the languages investigated pattern together, to the exclusion of the third one.

Our research investigates transfer effects from the background languages to the L3 (Italian), testing the current acquisition models. At the initial stages, wholesale and property-by-property transfer models predict positive influence from Spanish on generic subjects but diverge on number neutral objects. According to the Typological Primacy Model (TPM) (Rothman, 2015; Rothman et al., 2019), on this property, wholesale transfer from Spanish will be non-facilitative. For the Scalpel Model (SM) (Slabakova, 2017) and the Linguistic Proximity Model (LPM) (Westergaard, 2021), structural similarity between English and Italian will be beneficial. Spanish negative transfer on bare objects is expected by both TPM and LPM/SM, albeit more pronounced with wholesale transfer.

We tested 60 adult L3 Italian learners with English and Spanish alternatively as L1/L2. To address the role of use and input exposure, which for the SM can affect the L3 development, we recruited the L1 English (N = 30) in England and the L1 Spanish (N = 30) in Spain. These settings could favour the L1 English on objects and the L1 Spanish on subjects. Comprehension and use of generics were assessed in the L2 and L3 by means of an Acceptability Judgment Task, a Form–to–Meaning Task, and an Elicited Oral Production Task. The tasks were administered online in individual sessions.

A linear mixed model (R package *lme4*) was run on the Italian judgements, expressed on a 1–4 Likert scale. Significant differences ($p < .001$) were found between acceptable and unacceptable kind-referring subjects, as well as number neutral objects. Overall, these results suggest hybrid transfer, with facilitative effects from Spanish on subjects and English on objects. L3 proficiency is a predictor only in interaction with condition; that is, the trilinguals' performances on each property get better as proficiency in Italian increases. Individual data also show that, in both groups, some learners expressed indeterminate judgments. This was calculated by establishing a 1.0 threshold difference in ratings between (un)acceptable structures within contexts. Specifically, 26.67% of L1 English and 43.33% of L1 Spanish did not distinguish between subjects, while 53.33% of L1 English and 56.67% of L1 Spanish between objects. These data point to negative transfer from English (on subjects) and Spanish (on objects). Hence, more L3 input may be needed to notice similarities between background and target language. Taken together, these findings support the SM/LPM predictions about increasingly facilitative property-by-property L3 transfer. On the other hand, in this population, language setting affects acquisition only marginally.

Table 1. Trilinguals' proficiency levels in the L3 and L2

	L1 English	L1 Spanish
Proficiency levels in the L3 (Italian)	Advanced = 16 Intermediate = 11 Elementary = 3	Advanced = 14 Intermediate = 11 Elementary = 5
Proficiency levels in the L2 (Spanish, English)	Advanced = 26 Intermediate = 3 Elementary = 1	Advanced = 20 Intermediate = 9 Elementary = 1

Proficiency levels = advanced (above 80%), intermediate (60–79%), elementary (below 59%)

Table 2. Linear Mixed Effects Model performed on the Italian AJT data

Formula	lmer(RatingZscores ~ Condition * Group*cL3.Proficiency + (1|Subject) + (1|Item), data = ItaTrilJudCon)
Dependent variable	Rating Z score
Predictors ($p < .001$)	Condition5–4 (definite plural subjects–bare plural subjects) Condition7–6 (definite singular objects–bare singular objects) Condition5–4:cL3.Proficiency Condition7–6:cL3.Proficiency

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What source language do we rely on when speaking in L3? Investigating the modulating role of executive control on cross linguistic interference in L3 syntax production

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Introduction: Production of a non-native language is considered a challenging task, especially when the non-native language has two competitors. There is very little research on cross linguistic interference (CLI) in production processes such as speaking and writing, compared to comprehension processes, especially in the domain of syntax. The literature on CLI in trilinguals has identified more potential scenarios of transfer from previous linguistic knowledge than in bilinguals. To simplify, trilinguals speaking in their third language (L3), need to manage CLI from the first language (L1) and the second language (L2), whereas bilinguals speaking in L2 need to manage CLI only from L1. The current study examined CLI in L3 syntactic production, and asked what source of previous linguistic knowledge do we rely on when speaking in L3, is it the L1, the L2, or both?

The second aim of the present study was to explore the potential modulating role of executive control abilities to CLI in L3 production. The increased need to manage CLI in L3 especially in the challenging task of syntax production are expected to require greater executive control abilities, but very little is known about the role of executive control in L3 production processes. Thus, in the current study we ask whether individuals with better executive control abilities are better at managing CLI in L3 syntax production.

Method: Participants were 60 Arabic-Hebrew-English trilingual undergraduate students. They completed an elicited imitation task, in which they were required to repeat sentences that they heard in L3. The stimuli were grammatical and ungrammatical sentences eliciting different syntactic structures within four conditions of CLI (interference from L1 and L2, interference from L1, interference from L2, control). Responses were recorded, transcribed and coded for accuracy. Target structures were coded as sensitive/unsensitive to violations in ungrammatical sentences, and as preserved/not preserved in grammatical sentences. In addition, participants completed a battery of executive control tasks including inhibition, shifting, and working memory.

Results: To answer the first research question, preliminary analysis showed a significant interaction between condition and grammaticality of the sentence. In ungrammatical sentences, participants were least sensitive to violations when the interference was from L2 compared to other conditions. Similarly, although not significant, participants were less sensitive to violations when the interference was from L1 compared to control and to when the interference was from shared structures between L1 and L2. In grammatical sentences, both conditions, interference from L1 and interference from L2, were significantly different than control and interference from shared structures between L1 and L2. Regarding the second research question, preliminary analysis using shared variance between all measures of executive control showed no significant modulating role of executive control to CLI in L3 production.

Conclusion: The results demonstrate transfer from both sources of previous linguistic knowledge during L3 production, and suggest that the interplay between L1 and L3 and L2 and L3 is dynamic across different linguistic contexts.
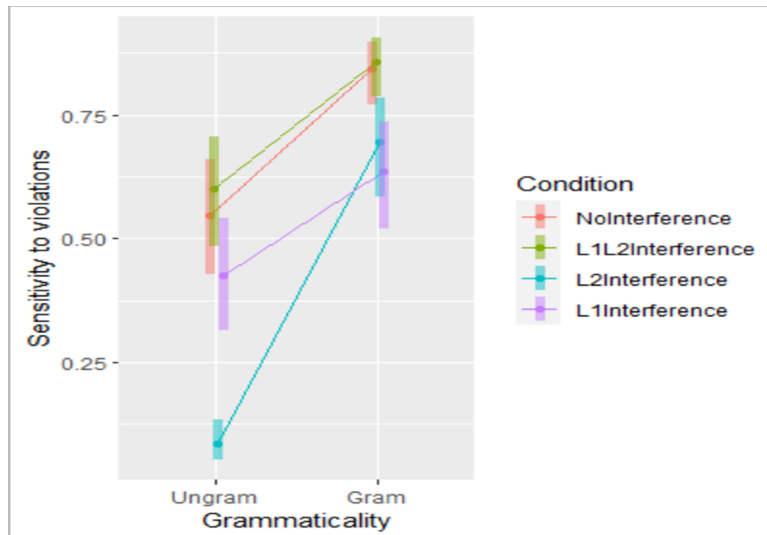
Figure 1: Interaction between Condition and Grammaticality.

A longitudinal view of Mandarin-English bilingual development of L3 Spanish stop consonants: language aptitude, metalinguistic knowledge and language use

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Previous studies on L3 phonology focused on the initial stages (e.g., Tremblay, 2007; Llama et al., 2010; Wrembel, 2011); also, since Hammarberg & William's (1993) seminal case study, few longitudinal studies have been conducted that trace how L3 sounds develop as proficiency increases. As a result, little is known about multilingual phonological development at different stages. To fill in this gap, the present study traces the VOT production of L3 Spanish stop consonants by L1 Mandarin-L2 English bilinguals at different levels of L3 proficiency. Our goal is to uncover developmental patterns as well as individual trajectories, and the way in which individual factors - language aptitude, L2 and L3 use, and metalinguistic knowledge - shape both.

To this end, data were collected monthly (September 2021 – January 2022) from 30 Spanish majors at a university in Beijing; their L3 Spanish proficiency spans from beginning to advanced. Participants were recorded reading word lists containing voiced and voiceless stop consonants in Mandarin, English and Spanish; stop tokens were coded for voice onset time (VOT) in word initial position. Participants also completed the LLAMA language aptitude tests (Meara & Rogers, 2019), a language use survey and a metalinguistic knowledge survey on pronunciation generalizations.

Multilevel mixed effect models (MLM) were fit separately for voiced and voiceless VOT. Results showed that Time had a significant effect on voiced but not voiceless VOT. At the Group level, voiced VOT demonstrated a descending trend over time, while voiceless VOT showed a flat pattern. At the Individual level, however, a high level of variability in developmental trajectories was observed (see Figure 1). Spanish proficiency, a control variable, was a significant predictor for voiced but not voiceless VOT (β = -0.42, p = .002), showing development of negative VOT (prevoicing) as L3 proficiency increases.

Regarding the effect of language aptitude, language use, and metalinguistic knowledge, for voiced VOT, scores of two LLAMA aptitude sub-tests: LLAMA E (β = -0.34, p = .04) and LLAMA B (β = 0.32, p = .03) emerged as significant predictors. In particular, stronger phonetic coding ability, as operationalized by higher LLAMA E scores, was associated with lower voiced VOT, suggesting more target-like prevoicing. Stronger association memory, as operationalized by higher LLAMA B scores, was associated with higher VOT values. At the same time, LLAMA D scores (sound recognition ability) showed a significant interaction with Time (β = -0.04, p = 0.006) – higher LLAMA D scores were linked to more rapid development of prevoicing. For voiceless VOT, MLM modeling revealed LLAMA E (β = -0.25, p = 0.004) and LLAMA B score (β = 0.24, p = 0.002) as significant predictors; also identified, a significant interaction between LLAMA B score and Time (β = -0.03, p = 0.01). No significant effects were identified for L2 and L3 language use nor for metalinguistic knowledge.

Our study uncovers different developmental trajectories for L3 Spanish voiced and voiceless VOT, and highlights the roles of different language aptitude components in shaping those trajectories. The findings contribute to a longitudinal view of individual differences in multilingual phonological development.

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Figure 1. Individual paths of voiceless (vl) and voiced (vd) VOT
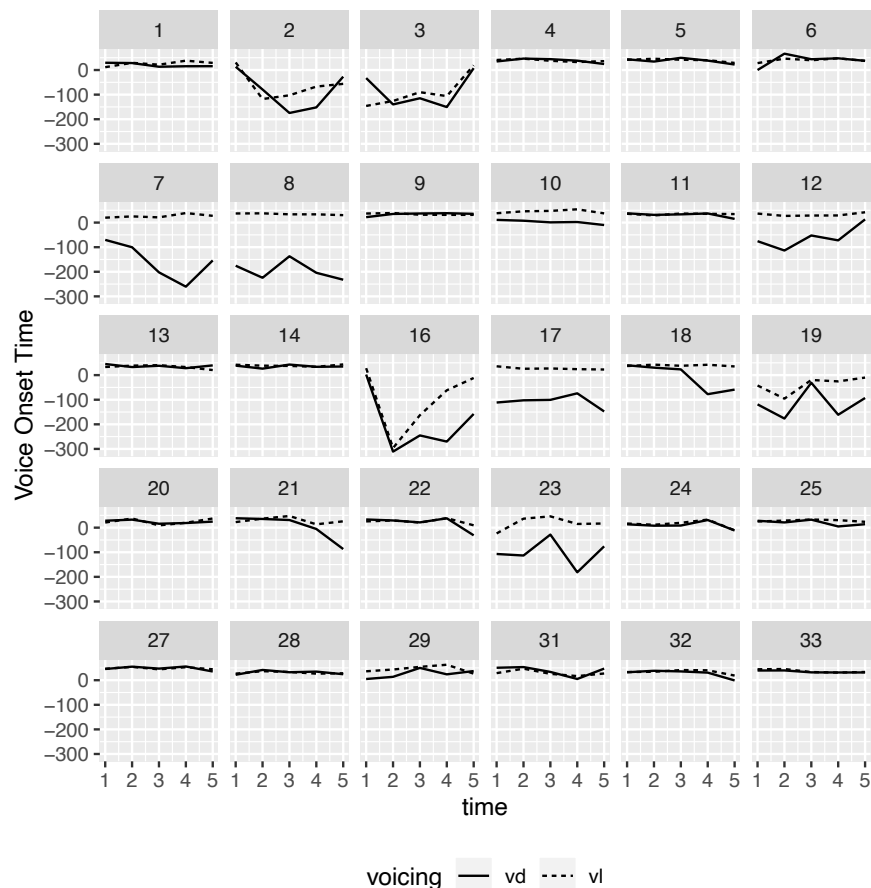
Exploring the effect of linguistic similarity in third language acquisition

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We present an artificial language learning experiment that contributes to novel insight about the relative influence of linguistic similarity between pre-existing grammars and a third language (L3). Using an artificial language allows us to explore the very beginning of the acquisition process and to have full control over the stimuli. We isolated the effect of crosslinguistic influence from learning by testing a property that the learners had not been exposed to in the L3. Our participants were Norwegian–English sequential bilinguals ($N = 120$). They were randomly assigned to one of four different L3s (Languages A–D). Importantly, the L3s differed in terms of morphosyntactic and lexical similarities to Norwegian and English, as follows:

- Language A: Norwegian-based lexicon and neutral morphosyntax.
- Language B: English-based lexicon and neutral morphosyntax.
- Language C: Norwegian-based lexicon and English-based morphosyntax.
- Language D: English-based lexicon and Norwegian-based morphosyntax.

The neutral morphosyntax in Languages A/B refers to Subject-Verb-Object (SVO) word order (example 1), which is found in both Norwegian and English. Crucially, this cue does *not* contribute to the establishment of one of the previously acquired languages as more similar to the L3 than the other. In Language C, we *also* exposed the participants to *do*-support (example 2)—a feature that exists in English, but not in Norwegian. This means that the learners of Language C were exposed to incongruent morphosyntactic and lexical cues, with the morphosyntax being more similar to English and the lexicon to Norwegian. In Language D, the additional morphosyntactic cue to SVO word order was post-nominal possessives (example 3). Norwegian accepts both pre- and post-nominal possessives, but English *only* accepts pre-nominal possessives, i.e., there was a morphosyntactic mismatch between the L3 and English. Again, this shows incongruency between the lexical and morphosyntactic cues, as the former was based on English and the latter on Norwegian.

After exposure to the artificial L3, we collected forced-choice acceptability judgements of non-subject-initial declarative clauses that varied in verb placement (example 4). The word order in (4a) is shared with Norwegian and the word order in (4b) with English. Examining the participants' acceptability judgements should reveal the preferred source of crosslinguistic influence and cannot be a result of learning. There were 18 sentence pairs in total: 12 fillers and six non-subject-initial declaratives.

The participants' choices are shown in Figure 1. We fitted a binomial mixed-effects model to the data and found a significant main effect of lexical cues and an interaction between lexical cues and incongruency (Figure 2). This suggests that bilinguals are sensitive to these cues in the input after minimal exposure to the target language. The effect of lexical similarity was particularly strong. This may be attributed to the early access to information about (pseudo)cognates and similar sounds in a new language. The results support similarity-driven models of L3 acquisition that argue for linguistic similarity between the L3 input and pre-existing grammars as the main driving force behind crosslinguistic influence.

(1)   *I*   **eaf**   wesh   ons   Daytue.
      I   **eat**   oranges   on   Tuesdays
      'I eat oranges on Tuesdays.'

(2)   *Ej*   **do**   <u>neit</u>   beudro knurk.
      I   **do**   <u>not</u>   like   grapes.
      'I do not like grapes.'

(3)   *Thamey*   **miz**   ef   Manene.
      Name.DEF   **my**   is   Manene
      'My name is Manene.'

(4)   a.   Pån   dagman   **knetter**   *ej*   aporo.
            On   Monday   **eat**   *I*   apples
      b.   Pån   dagman   *ej*   **knetter**   aporo.
            On   Monday   *I*   **eat**   apples
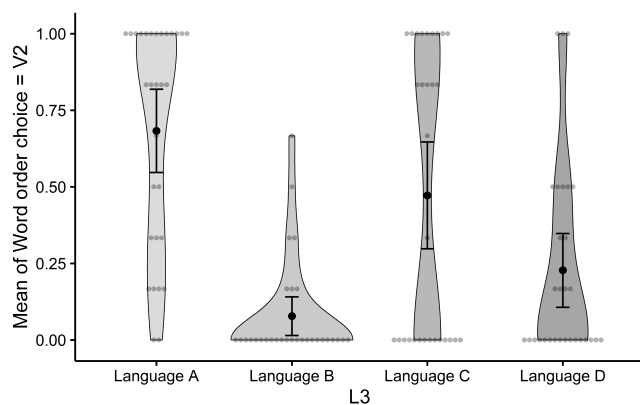
Figure 1: Mean proportion of V2 responses by group
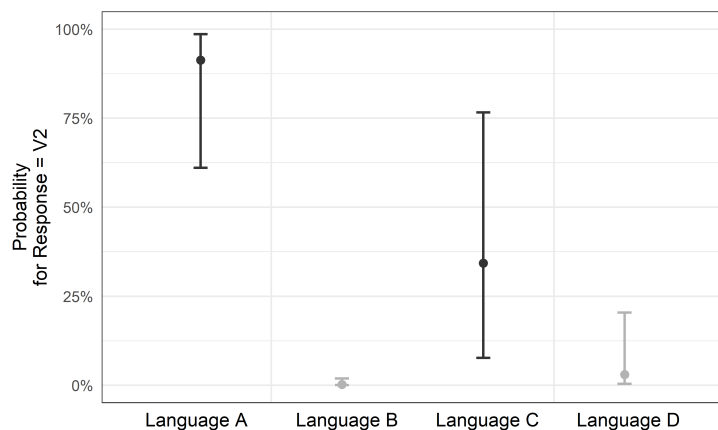
Figure 2: Probability of selecting V2 word order by the type of artificial language

A Fully Combined Design of the Categorization of Unknown Language Vowels by Spanish-English Bilinguals

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In the growing field of third language acquisition, various models aim to predict how individuals with two language systems (the L1 and L2) approach and acquire a new, third language. Distinct models have been proposed as a result of empirical work done largely in studies in L3 morphosyntax. These models propose that various linguistic factors may explain patterns observed in L3 learners, including language status (Bardel & Falk, 2007), perceived psychotypological similarity between languages (Rothman, 2015), or underlying structural similarity (Westergaard et al., 2017; Slabakova, 2017). Importantly, all of these views have gained some support in the L3 morphosyntax literature (Puig-Mayenco et al., 2020; Rothman et al., 2019), but the impact of each of these factors in L3 phonology remains an open question.

The present study adds to this lack of work done in L3 perception by examining both monolingual and bilingual categorization of vowel sounds in two languages that they do not speak in order to determine whether a) order of acquisition or b) cross-linguistic similarity (typology) better predicts the categorization of L3 sounds. The group design was chosen to operationalize order of acquisition, where the choice to expose bilinguals to two distinct novel languages was chosen to investigate whether cross-linguistic acoustic similarity impacts categorization. In particular, a fully combined design of Spanish and English bilinguals completed a vowel categorization task, similar to those done in studies in bilingual phonology (Best & Tyler, 2007). In the task, participants listened to an L3 vowel sound and were given English and Spanish orthographic vowels in carrier words. Their task was to match the played sound to either an English or Spanish sound by pressing a key on their keyboard. Following each selection, participants rated their selection on a continuous 1-5 scale. There were 4 vowel conditions (Spanish-like /o/, English-like wedge, both /i/, and neither /y/) in both German and French. These new languages were chosen due to the typological proximity between each language pair. The carrier words in English were *feel*, *fought*, *fun* and *fool*, and the Spanish carrier words were *fin*, *son* and *su*.

199 participants took part in the study, who made up 4 total groups: L1 English–L2 Spanish (n = 55), L1 Spanish–L2 English (n = 59), English monolingual (n = 59) and Spanish monolingual (n = 29). The results of a series of Bayesian Multinomial regression models suggested that bilinguals categorize L3 vowels using both L1 and L2 categories according to the acoustics of the input. There was no evidence of a clear bias for either the L1 or L2 when an L3 vowel exists in both the L1 and L2. Additionally, the bilingual English participants differed from English monolinguals in their categorization of new language sounds. These results have implications for both the PAM-L2 and L3 models, by showing that the language learners are not solely guided by their native language, and have access to both L1 and L2 categories when accounting for novel language sounds.

Syntactic CLI in a longitudinal study on L3 Norwegian among L1 Polish – L2 English speakers

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In this presentation we report on the syntactic results of a longitudinal study of crosslinguistic influence among L1 Polish speakers of L2 English and L3 Norwegian acquired in an instructed setting. We focus on the interaction between selected syntactic phenomena (see examples below) and the development of language proficiency over the span of 8 months. By investigating the influence of variables such as TIME and CONDITION on the process of acquisition, we also contribute to the discussion on the source of cross-linguistic influence and patterns of change over time in the light of currently proposed models, such as the Typological Primacy Model (e.g. Rothman et al. 2019), or the Linguistic Proximity Model (e.g. Westergaard et al. 2017; Westergaard 2021).

The L3 Norwegian learners (n=24, mean age 20) first participated in the study after 8-9 weeks of first exposure (T1), the second data collection (T2) took place after 24-26 weeks and the third one after 35-36 weeks of exposure. We tested the applicable conditions (e.g. articles only in English and Norwegian) in all three languages in separate blocks administered over two days. An acceptability judgment task was designed with 4 conditions (and 8 sub-conditions), two of which showed similarity between Polish and Norwegian (pronominal binding and the position of adverbs of frequency) and two between English and Norwegian (definite and indefinite articles). The L3 AJT included 10 experiment items per condition with additional distractor sentences (50 total), the L1 / L2 AJT each included 6 items per condition plus distractors (30 total). Each experimental item was introduced by a background sentence; two lists were created so that each participant would only see one sub-condition for each experimental item. Responses were collected using a 5-point Likert scale. The participants completed the Language History Questionnaire (Li et al. 2006) and proficiency tests in L2 and L3 to assess their proficiency at each testing point. Additionally, an L2 control group (with L1 English, L2 Norwegian) was tested to help us isolate the role of L2 English for the experimental group of L3ers.

We set out to examine whether and to what extent the Polish=Norwegian and English=Norwegian conditions are (non-)facilitative in the acquisition of L3 Norwegian. The data were analyzed using ordinal logistic regression modeling, with TIME and CONDITION as predictor variables. The results did not show clear L1 facilitation for constructions present in all three languages (pronominal binding, pre-/post-verbal adverbs); however, some L2 facilitation was found for definite and indefinite articles. Our data also confirmed greater learnability for definite than indefinite articles. Additionally, we compared the performance of our experimental group to an L1 English – L2 Norwegian control group. However, higher Norwegian proficiency in the control group yielded inconclusive results.

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Examples of conditions (simplified, no context sentences):

1a $Jan_{1/?2}$ znalazł $swoje_1$ /$jego_2$ klucze. (Polish)   (*pronominal binding*)
         Jan   found   self   his   keys

1b $John_1$ found $his_{1/2}$ keys. (English)

1c $Jan_{1/*2}$ fant   nøklene $sine_1$ / $hans_2$. (Norwegian)
         Jan   found   keys   self   his

2a   Janek   rzadko czyta   (%$rzadko^1$)   e-booki. (Polish)   (*adverb placement*)
         Janek   seldom   reads   seldom   e-books

2b   John seldom reads (*seldom) e-books. (English)

2c   Øystein   (*sjelden)   leser   sjelden   e-bøker. (Norwegian)
         Øystein   seldom   reads   seldom   e-books

3a   Hunden /   *hund er   veldig liten. (Norwegian) (*def. article*)
         The dog   dog   is   very   small

3b   The dog / dog is very small.

4a   Hun hørte   på   en / Ø   interessant podcast   i   bilen. (*indef. article*)
         she listened   to   an / Ø   interesting   podcast   in   the car

4b   She was listening to an / ~~an~~ interesting podcast in the car.

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[1] Marked but acceptable.

Predictors of foreign accentedness in L3

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Ratings of perceived global foreign accent have been widely applied in second language acquisition (SLA) research, (e.g., Flege 1988; Piske et al. 2001); however, this phenomenon has been less frequently explored from the multilingual acquisition perspective (but see Wrembel 2015). Further, the most recent L3 studies focus mostly on heritage speakers (Lloyd-Smith, Gyllstad, Kupisch 2017; Lloyd-Smith 2021). Previous research on factors contributing to a perception of accentedness has identified the amount of L1 use, the age of arrival in an L2-speaking country and the presence of non-native segmental features in rated samples as the most significant predictors.

The present study forms one part of a large project investigating L3 development longitudinally. It aimed to explore to what extent a holistic assessment of global accent in the third language is correlated with the learners' general proficiency level, oral fluency and fine-grained phonetic performance. The participants were 24 speakers of L1 Polish, L2 English, L3 Norwegian, aged 21, after 8 weeks of intense initial exposure to the L3 in a formal academic setting. They performed a Norwegian placement test as a measure of proficiency and completed the Language History Questionnaire (Li et al. 2006). The language material used in the rating study was the participants reading a Norwegian version of *The North Wind and the Sun* text. Oral reading fluency was expressed as the number of words per minute (wpm). Fine-grained phonetic performance was assessed based on the reading of a word list in L3 including /p, t, k/ stop tokens in stressed onset positions where Norwegian, but not Polish, displays long VOTs.

In the rating study, approximately 20-second-long samples were extracted from the recordings of the read text and normalised for loudness. Twenty-three raters, half of whom were Norwegian native speakers and the remaining half were highly proficient in Norwegian, rated the samples for the degree of foreign accentedness and comprehensibility on a 9-point scale, using a Qualtrics online survey. The survey included 30 randomised samples, featuring the 24 L3 learners and 6 Norwegian controls. The raters had moderate to considerable amount of previous experience with foreign accented speech in Norwegian.

A preliminary analysis shows inverse correlations between Accentedness and Proficiency level (Pearson's r = −0.16); Accentedness and Length (i.e. the slower the speech rate, the stronger the perceived accent) (r= −0.24), and Comprehensibility vs. Length (r= −0.17). There were positive correlations between Comprehensibility and Proficiency (r = 0.11); and the two rating parameters of Accentedness and Comprehensibility (r = 0.185). We also fit linear mixed effects models (via Rbrul, see Johnson 2009) with Norwegian proficiency and the length of utterance as fixed effects, and by-speaker and by-rater random intercepts. For Accentedness, the best model only included Length as a significant factor (t=2.72, p=0.1), while for Comprehensibility, it was VOT value for /t/ (t=-3.196, p<0.05). The findings indicate that overall spoken fluency is the best predictor of the perceived global accent in L3 speech. Ongoing analyses will further verify the hierarchy of variables as proposed by NGTA (Dziubalska-Kołaczyk and Wrembel 2022).

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The Multilingual Picture Database

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The growing interdisciplinary research field of psycholinguistics is in constant need of new and up-to-date tools which will allow researchers to answer complex questions, but also expand on languages other than English, which dominates the field. One type of such tools are picture datasets which provide naming norms for everyday objects. However, existing databases tend to be small in terms of the number of items they include, and have also been normed in a limited number of languages, despite the recent boom in multilingualism research. In this paper we present the Multilingual Picture (Multipic) database, containing naming norms and familiarity scores for 500 coloured pictures, in thirty-two languages or language varieties from around the world. The data was validated with standard methods that have been used for existing picture datasets. This is the first dataset to provide naming norms, and translation equivalents, for such a variety of languages; as such, it will be of particular value to psycholinguists and other interested researchers. The dataset has been made freely available.

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