Cross-linguistic influence on the interpretation of ambiguous wh-questions: L1 transfer but no L1 attrition

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Cross-linguistic influence in syntactic processing among bilinguals is well attested, yet only few studies have investigated the influence of *L2 on L1* sentence processing among sequential bilinguals in long-term immersion settings (expats/"attriters"; Schmid & Köpke, 2017). Recent behavioural and ERP studies have shown mixed results from expats' (neuro-)cognitive processing of morphosyntax in their L1. While Bergmann et al. (2015) reported native-like processing of morphosyntactic violations even after decades of L2 exposure, Dussias and Sagarra (2007) found a shift in RC attachment preferences in the L1 after long-term L2 immersion. More recently, Kasparian and Steinhauer (2017) found expats treated *grammatical* constructions in their L1 as violations if their L2 word-order-equivalents were *ungrammatical*, with the strength of violation effects modulated by length of L2 exposure and proficiency. Based on these findings, we hypothesize that expats' processing of structurally *ambiguous* sentences in the L1, whose word-order-equivalents in the L2 are *unambiguous,* will also show L2 influence. Specifically, we predict that L1-German/L2-English expats would preferentially interpret a globally ambiguous *wh*-question in their L1 German with the only interpretation available for its English word-by-word translation. Due to differences in main verb position in (1a&b), this predicts a bias towards a subject-question in the present (1a), and an object-question in the perfect tense (1b). Such differential biases were previously shown in an offline picture-pointing experiment with beginning-level L1-English learners of L2-German (Grüter, 2006). In a visual-world eye-tracking experiment, we test whether evidence of such effects also emerges going from a dominant L2 to the L1, and we directly compare L1-to-L2 and L2-to-L1 effects.

L1-German speakers in the U.S. ('expats', n=21; mean length of residence: 14.5yrs, LexTALE English *M*=88, LexTALE German *M*=89, median daily use of German: 10-20%), L1-German speakers in Germany ('L1ers', n=29), and L1-English learners of L2-German in the U.S. ('L2ers', n=22) listened to questions like (1a&b) while looking at visual scenes as in Fig.1, with the instruction to click on the animal representing the answer to the question. GLMER analyses of click responses (Fig.2) revealed a main effect of tense (*b*=-1.3, *p*=.001), with more subj-wh interpretations in the present vs. perfect. The effect was modulated by interactions with Group L1:L2 (*b*=-1.3, *p*<.001) and expat:L2 (*b*=-1.0 , *p*=.006), but not L1:expat (*b*=-.3 , *p*=.4). These findings show significantly greater change in bias by tense among L2ers (→L1 influence on L2), and no differences between expats and L1ers (→no L2 influence on L1). Click RT was comparable in L1ers (*M*=2966ms) and expats (*M*=2960ms), and longer in L2ers (*M*=3703ms, *p*<.01). In order to probe for potential temporary indices of cross-linguistic influence and/or uncertainty, we examined participants' looks over time, grouping together looks to the animal they clicked on in that trial ('Response'), to the animal constituting the other possible response ('OtherOption'), and looks elsewhere, including the animal named in the question (Fig.3). No consistent differences emerged between looking patterns in the expat vs. L1 groups between the onset of the noun ('Katze') and mean click RT. Notably, looks to the ultimate response increased sharply after NP onset in all groups, while looks to the OtherOption decreased and remained low, thus showing no evidence of syntactic competition in these globally ambiguous questions (cf. van Gompel et al., 2005).

In sum, while the predicted effects of cross-linguistic influence emerged in the L2ers' responses, no such effects were observed in the expats' offline or online behavior. Moreover, neither their off- nor online performance was modulated by length of exposure, L2 proficiency (LexTALE English), or language dominance (LexTALE English minus LexTALE German). Thus despite clear L1-to-L2 effects in the English learners of German, we observed remarkable resilience to cross-linguistic influence from an L2 to the L1 in the context of interpretive preferences for globally ambiguous sentences in the L1. These findings are in line with Schmid & Köpke's (2017) claim that L1 attrition effects in syntactic processing are limited in post-puberty L2 learners.

(1) a. **Was leckt die Katze?** (= subject-q or object-q)
what lick.3SG the cat
'What licks the cat?' (=subject-q) *or* 'What does the cat lick?' (=object-q)

b. **Was hat die Katze geleckt?** (= subject-q or object-q)
what have.3SG the cat licked
'What has the cat licked?' (=obj-q) *or* 'What has licked the cat?' (=subj-q)

Fig1. Sample visual scene.

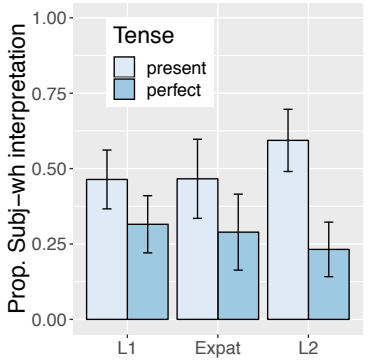

Fig2. Mean Click responses (95% CIs)

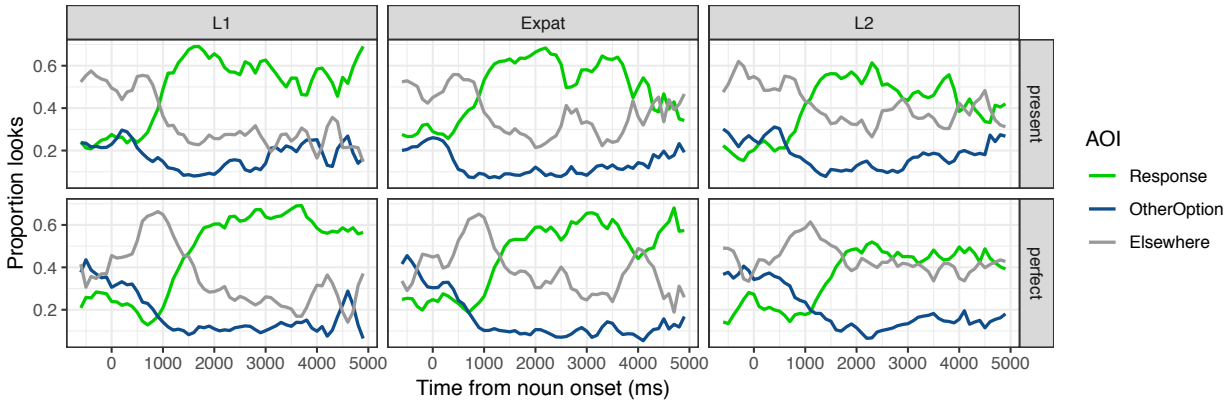

Fig3. Proportion looks to the animal clicked on (Response = agent or patient), the non-chosen option (OtherOption = patient or agent), and elsewhere on the screen (including the animal named in the question), by group and tense. 0 = noun onset (e.g., 'Katze')

REFERENCES

Bergmann et al. (2015). Prolonged L2 immersion engenders little change in morphosyntactic processing of bilingual natives. *NeuroReport*.

Dussias & Sagarra (2007). The effect of exposure on syntactic parsing in Spanish–English bilinguals. *Bilingualism: Language and Cognition.*

Grüter (2006). Another take on the L2 initial state: Evidence from comprehension in L2 German. *Language Acquisition*.

Kasparian & Steinhauer (2017). When the second language takes the lead: Neurocognitive processing changes in the first language of adult attriters. *Frontiers in Psychology.*

Schmid & Köpke (2017). First language attrition and bilingual development. *Linguistic Approaches to Bilingualism*.

Van Gompel et al. (2005). Evidence against competition during syntactic ambiguity resolution. *Journal of Memory and Language*.