

L2 Syntactic Adaptation in Comprehension: Evidence of Implicit Learning

Eunjin Chun, Shulin Liu, & Si Chen (The Hong Kong Polytechnic University)

eunjin.chun@polyu.edu.hk

Research suggests that native speakers quickly adapt to syntactic structures of linguistic input during comprehension and implicit learning mechanisms (e.g., error-based learning) underlie their syntactic adaptation (Fine et al., 2013). However, only a few studies have so far investigated L2 speakers' syntactic adaptation in comprehension and such studies provided mixed findings. In a study using ambiguous relative clauses (RCs) in German (NNV RCs), Nitschke et al. (2014) found that L2 speakers of German who initially preferred subject RCs changed their parsing bias toward object RCs after exposure to object RCs in the prime phase. On the other hand, in a priming study using temporarily ambiguous reduced RCs (e.g., "The architect selected by the manger was educated at Yale"), Wei et al. (2018) found priming effects in Chinese learners of English, only when the prime-target pairs shared the verbs (i.e., faster reading times for the disambiguating region in the targets than in the primes). More recently, Kaan et al (2019) investigated Spanish-L1 and English-L2 speakers' syntactic adaptation in the reading paradigm using two types of temporarily ambiguous structures: filled-gap constructions in *wh*-clause (e.g., "The builder wondered what the worker repaired the leak with before going home") and *and* coordination ambiguities (e.g., "The servant cleaned the table and the floor was cleaned by the maid"). Their results, however, showed no adaptation effect toward any type of these structures.

As such, inconclusive findings from prior studies leave many questions open. In particular, no adaptation effects or lexically dependent priming effects in L2 comprehension lead to a fundamental question of whether L2 speakers are able to adapt to abstract syntactic structure during comprehension because lexically dependent priming effects, as pointed out by Harsuiker & Bernolet (2017), may be attributable to L2 speakers' strategy using explicit memory, not relating to abstract syntactic processing. The current study therefore investigated whether L2 listeners are able to adapt toward a complex syntactic structure (e.g., RC attachment) during speech comprehension, and if so, what mechanism underlies their adaptation. First, L1-Chinese and L2-English participants' RC attachment bias was measured at the pre-test using ambiguous RCs. Then, at the exposure stage in a block design, two groups of L2 learners (25 participants in each group) who showed low attachment (LA) bias at the pre-test listened to 56 sentences of low attachment (e.g., "I know the cat of the woman that will wear the shoes", LA group) and high attachment (HA; e.g., "I see the cat of the woman that will wear the collar", HA group), respectively. After the exposure stage, L2 learners' adaptation for each structure type (i.e., change in their LA interpretations) was measured using 9 ambiguous RCs at the immediate post-test (the post-test 1 on Day 1) and at the delayed post-test (the post-test 2 on Day 2; see Fig. 1 for the flow of the entire experiment).

In order to understand L2 learners' adaptation, we structured a logistic linear mixed-effects model on LA interpretations separately for each group. According to the results, the HA group showed significant adaptation (i.e., decrease in LA interpretations) at the post-tests on Day 1 (pre-test vs post-test 1: $b = -1.73$, $SE = 0.30$, $z = -5.86$, $p < .0001$) and Day 2 (pre-test vs post-test 2: $b = -2.46$, $SE = 0.30$, $z = -8.28$, $p < .0001$) whereas the LA group did not show any significant effect (see Fig. 2). These results provide empirical evidence that L2 speakers are able to adapt toward abstract syntactic structures while comprehending L2 speech. More importantly, adaptation effect for the initially less preferred structure (HA) and long-lasting adaptation effect observed on Day 2 suggest that the error-based implicit learning mechanism may underlie L2 syntactic adaptation in comprehension.

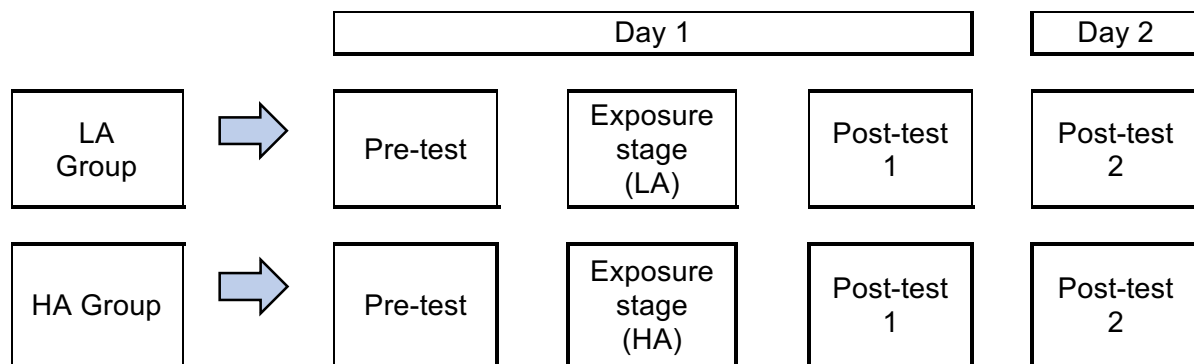


Fig 1. The flow of the experiment

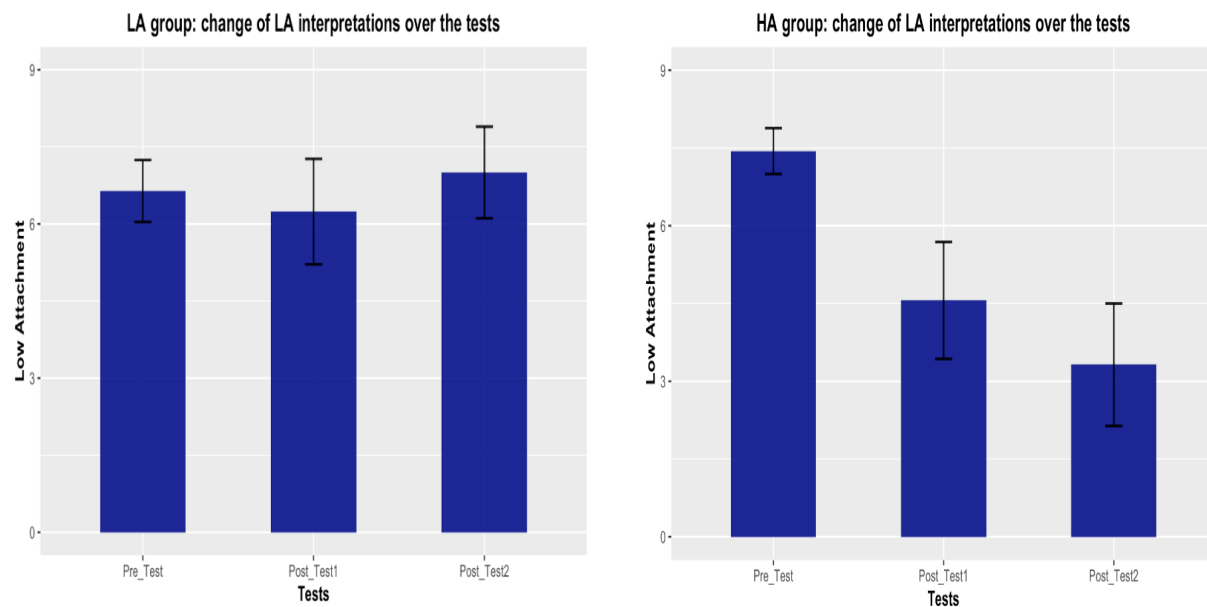


Fig 2. Change of LA interpretations over the tests; Error-bars: SE

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