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Susceptibility to interference affects the second and the first language*

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Memory is an integral part of language processing. Given this, a better understanding of how people learn, represent and process language requires considerations of the principles of memory that support language comprehension. Cunnings' paper (Cunnings, 2016) does just this. The core of his proposal is that second language (L2) processing that is non-target like can be explained in terms of memory operations rather than by invoking a shallow processor (cf. Clahsen & Felser, 2006).

Specifically, Cunnings suggests that the ability of speakers to efficiently process linguistic input in the L2 relies on their ability to retrieve information from memory; critically, susceptibility to interference from the first language, and not memory capacity per se, drives the perceived differences between L1 and L2 processing. We welcome the interdisciplinarity of Cunnings' approach and believe that his proposal will serve as a bridge to link the memory literature to second language research. Our goal here is to elaborate on Cunnings' insights to consider differences among bilinguals[1] that result as a function of the context of language use and of exposure to linguistic input.

Cunnings discusses evidence indicating that L2 speakers with extensive exposure to a second language perform retrieval operations at similar points in the sentence as L1 speakers. But studies indicate that this very same exposure can change processing strategies in the native language (e.g., Dussias & Sagarra, 2007). One discovery that has shaped our understanding of bilingualism is that once speakers are sufficiently proficient in the L2, not only does the native language influence the second language, but the second language comes to influence the first language (e.g., Kroll, Dussias, Bice & Perrotti, 2015). Evidence of change to the first language has been observed at the earliest stages of L2 learning (e.g., Bice & Kroll, 2015), and recent findings show that extended exposure to the second language is not the only context that can bring about L1 change; short-term exposure can also change processing routines in the L1. To illustrate, in a recent eyetracking study investigating relative clause ambiguity resolution (Dussias, Perrotti, Carlson & Morales, 2016), native Spanish speakers who became proficient L2 speakers of English during adulthood were pre-tested to classify them as "high attachers" or "low attachers" while they read temporarily ambiguous relative clauses in their L1 (e.g., *Miguel localizó a la amiga del peluquero que era griega de origen*/'Miguel located the friend of the hairdresser who was Greek by origin'). Next, they were exposed to a five-day intervention study during which they read short paragraphs containing relative clauses in which the syntactic ambiguity was resolved opposite to their natural attachment preference. L2 speakers who favored high attachment in their L1 Spanish received a low attachment treatment, and those who favored low attachment received a high attachment treatment. Within each group, half of the participants were randomly selected to receive the intervention in Spanish and the other half in English. Participants returned to the lab after the intervention study to participate in two subsequent eyetracking experiments, one that assessed the immediate effect of the intervention and one that assessed the effect of the intervention a week after it was completed. The findings showed that those participants who originally preferred high attachment switched to a low attachment preference after the intervention and maintained the low attachment preference by the second posttest. Similarly, participants who originally showed a low attachment strategy switched to high attachment. Critically, whether the intervention was in Spanish or in English did not affect the pattern of results, suggesting that processing strategies, even in the entrenched L1, can change with relatively limited exposure to linguistic input. What these findings indicate is that L2 speakers must be tested not only in their L2 but also in their L1 if we are to determine the nature of the information that is actually retrieved from memory during L2 processing.

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[1] We adopt a broad definition of bilingualism to include speakers who actively use two or more languages, regardless of whether those languages were acquired in early childhood or later in life.

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The bilingual experience is necessarily complex, and the evidence suggests that the constant interplay between the two languages involves a dynamic set of adaptive changes across the lifespan (e.g., de Bot, Lowie & Verspoor, 2007). The fundamental permeability across the two languages makes early and late L2 learners similar to one another. It also makes cross-language interactions bidirectional, changing the way that bilinguals process each of the two languages, and creating different language profiles for bilingual and monolingual speakers in their shared language. The bidirectional influences render the bilinguals' two languages functionally distinct from the native language of monolingual speakers (Grosjean, 1989). Cunnings' proposal seems to assume a static view of the L1, but given the recent evidence, it is important to understand how the modulation of the native language, a phenomenon observed in highly proficient L2 speakers, may function to enable L2 learners to achieve successful outcomes.

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