

EDITORIAL

# Critical periods for language acquisition: New insights with particular reference to bilingualism research

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One of the best-known claims from language acquisition research is that the capacity to learn languages is constrained by maturational changes, with particular time windows (aka ‘critical’ or ‘sensitive’ periods) better suited for language learning than others. Evidence for the critical period hypothesis (CPH) comes from a number of sources demonstrating that age is a crucial predictor for language attainment and that the capacity to learn language diminishes with age. To take just one example, a recent study by Hartshorne, Tenenbaum and Pinker (2018) identified a ‘sharply-defined critical period’ for grammar learning, and a steady decline thereafter, based on a very large dataset (of 2/3 million English Speakers) that allowed them to disentangle critical-period effects from non-age factors (e.g., amount of experience) affecting grammatical performance. Other evidence for the CPH comes from research with individuals who were deprived of linguistic input during the critical period (Curtiss, 1977) and were consequently unable to acquire language properly. Moreover, neurobiological research has shown that critical periods affect the neurological substrate for language processing, specifically for grammar (Wartenburger, Heekeren, Abutalebi, Cappa, Villringer & Perani, 2003).

In bilingualism research, the CPH has received a somewhat mixed response, with some researchers plainly denying that critical periods constrain language acquisition (e.g., Bialystok & Kroll, 2018) and others having ‘little doubt’ that language acquisition is subject to critical period effects (Meisel, 2013: 71). It is true that early onsets of bilingual first language acquisition (during childhood) do indeed typically yield better linguistic skills than later ones, in line with the CPH. On the other hand, individuals with early onsets of acquisition of a particular language are typically also younger when they learn that language and have a longer time of exposure than individuals with a later onset of acquisition. Given these potentially confounding factors, supposed critical period effects might be open to alternative interpretations.

Our KEYNOTE ARTICLE (Mayberry & Kluender, 2018a) offers a new challenging perspective on the CPH by relying mainly on studies of the acquisition of sign languages, the specific learning circumstances of which

offer a unique opportunity to disentangle genuine critical-period effects from non-age factors affecting linguistic performance. Mayberry and Kluender specifically compare linguistic outcomes of the acquisition of sign languages in post-childhood L2 learners with that of post-childhood L1 learners. Their most striking finding is that late L1 learners perform significantly worse in morphology, syntax and phonology than late L2 learners. This contrast appears to be unrelated to non-linguistic cognitive or motivational factors but is attributed instead to very late L1 learners having developed an incomplete brain/language system during childhood brain maturation. L2 learners, on the other hand, have already established a fully-fledged brain/language system during this period. Mayberry and Kluender conclude from the more substantial age-of-acquisition effect in adult L1 than in adult L2 learners that there is a critical period for the acquisition of a first language only, whereas L2 development is affected by other factors.

Fifteen commentaries, most of which were specifically selected to represent different views on the CPH from the perspective of bilingualism research, accompany the keynote article. Many commentators praise the keynote article for drawing attention to the acquisition of sign languages, which through comparisons of late L1 and L2 learners contributes important insights for our understanding of a critical or sensitive period for the acquisition of language. Woll (2018) reports an additional case of late L1 acquisition of (British) Sign language, a deaf person with very late exposure to L1, who exhibits severe difficulties with syntax and phonology despite intact cognitive skills, in line with the findings reported in the keynote article. On the other hand, Mayberry and Kluender’s (2018a) claim that maturational factors (viz. critical or sensitive periods) do not affect L2 acquisition has received a less positive response from many commentators. Several commentators point to evidence indicating age-of-acquisition effects on L2 speakers’ linguistic skill and to models of L2 acquisition that account for the role of maturational constraints implicated by the CPH (Abrahamsson, 2018; DeKeyser, 2018; Hyltenstam, 2018; Long & Granena, 2018; Newport, 2018; Reh, Arredondo & Werker, 2018;

Verissimo, 2018). As opposed to these researchers, some commentators question the role of critical or sensitive periods for language not only for L2 but also for L1 acquisition (Bialystok & Kroll, 2018; Flege, 2018). Other commentators highlight specific limitations of the proposed account and of the data presented in its support. Birdsong and Quinto-Pozos (2018) note that what is missing from Mayberry and Kluender's comparison of late L1 vs. L2 signers is a role for bilingualism, arguing that comparing bilinguals with monolinguals will always reveal differences regardless of the age of L2 acquisition. Emmorey (2018) questions the keynote article's claim that if L2 outcomes were fully under the control of a critical period, they should not be as variable as they are and affected by cognitive or motivational factors, by pointing out that this variability does indeed extend to L1 learners. Lillo-Martin (2018) points out that there may be domain-specific splits with respect to critical periods, with different age cutoffs for different linguistic phenomena, a possibility that is not considered in any detail in the keynote article (see also Verissimo, 2018). Finally, Bley-Vroman (2018) and White (2018) use the evidence presented in our keynote article to address the question of whether or not domain-specific learning mechanisms are available to adult language learners; see also Clahsen & Muysken (1986; 1989).

In their response, Mayberry and Kluender (2018b) highlight points of agreement, clear up misunderstandings, admit current limitations of their proposal, and welcome suggestions for future research. Most importantly, however, in the face of the commentaries Mayberry and Kluender (2018b) modify their original claim of a critical period for L1 acquisition only. They now sympathize with the idea that there are critical periods for both L1 and L2 acquisition, but with less severe AoA effects on late L2 acquisition than on delayed L1 acquisition, due to L2 speakers having learnt another language early in life; see Hyltenstam (2018) and Newport (2018).

We hope our readers will enjoy the keynote article together with the commentaries and the authors' response as well as the interesting regular research articles and research notes presented in the current issue.

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