

Signers and speakers, age and attainment

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This commentary on Mayberry and Kluender (2017) considers the geometry of the function relating Age of Acquisition (AoA) to L2 attainment, the effects of multilingual exposure on one's native language(s) and, briefly, the role of education in language learning.

On a critical period (CP) account of second-language (L2) ultimate attainment, there should be a discontinuity in the AoA / L2 ultimate attainment function, the inflection point coinciding with a known maturational milestone. Mayberry and Kluender observe that most of the variance in L2 ultimate attainment can be accounted for by a single linear function; including a break point in the function does not represent a significant improvement over linearity. Vanhove (2013) supports this conclusion with additional analyses and advances more appropriate statistical models. Vanhove also notes the need for larger sample sizes. The power desideratum is achieved by Hartshorne, Tenenbaum and Pinker (in press), who examine grammaticality judgments for English sentences in an online survey of 669,498 participants; of these, about a third were English monolinguals and the rest, representing several thousand different native languages, had learned English in immersion or non-immersion settings. For L2 learning ability the authors find something of a “stretched-7” geometry (see also Birdsong & Molis, 2001; Veríssimo, Heyer, Jacob & Clahsen, 2017): a plateau extending past adolescence to AoA 17.4 years, followed by an unbounded decline over all AoA. For L2 ultimate attainment, which Hartshorne et al. examine separately from learning ability, this decline begins around 10–12 years. Roughly similar geometries are observed for immersion and non-immersion learners, with lower overall scores among non-immersion learners. Candidate sources for unbounded declines that begin post-maturationally (as well as individual attainment differences) include age-modulated motivation and opportunities to learn, entrenchment of (or

interference from) the L1, and neurological changes past childhood and adolescence (see Birdsong, in press).

Hartshorne et al. also observe that participants who learned two languages starting at birth do not behave like English native monolinguals: rather, their performance is significantly lower. Monolingual vs. early-bilingual attainment differences relate directly to critical period theory: a putative determinative effect of maturation does not adequately account for AoA-related attainment if ultimate monolingual-likeness is unattested in the two languages of simultaneous bilinguals. Put another way, differences between monolinguals and bilinguals from birth must be due to something other than age.

In this light, additional studies of hearing signers exposed to ASL from birth are important evidence. Following Mayberry and Kluender's proposal about effects of early/native exposure to language, these hearing signers should presumably perform similarly to their deaf native-signing peers on ASL L1 behavioral measures. Yet, noticeable differences in L1 performance between deaf and hearing native signers are reported (Emmorey, Petrich & Gollan, 2013; Supalla, Hauser & Bavelier, 2014). For example, Supalla and colleagues describe results of an ASL sentence reproduction task that reveals more morphological, lexical, and phonological errors by hearing native signers than by deaf native signers.

In addition, Emmorey, Giezen and Gollan's (2016) review of research on cross-modal bilingualism reveals bi-directional influences between signed and spoken languages in comprehension and production, as well as bi-directional activation at the semantic, syntactic and lexical levels. Such findings suggest that, in cross-modal bilingualism, as with unimodal bilingualism, comparisons of from-birth bilinguals with monolinguals will reveal differences, no matter what the age of L2 acquisition. As one source of these differences, it is reasonable to suggest a role for the nature of bilingualism itself, since neither the L1 nor the L2 of active bilinguals, whatever their age

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of acquisition, is monolingual-like in every imaginable respect, but each reflects influences of the other language (see Birdsong, in press).

Accordingly, studying signers to advance understanding of L2 knowledge and processing may require consideration of ALL the languages (and channels of communication) used. This includes L2 writing and speaking for deaf signers, and signing, speaking and writing for native hearing signers, keeping in mind that studies of language processing reveal dual activation during reading tasks for deaf signers (e.g., Morford, Wilkinson, Villwock, Piñar & Kroll, 2011). The full picture of multilingualism among native signers involves exploring an array of factors (education, literacy, dominance relations among languages, etc.) that likely influence attainment and maintenance of languages.

Finally, as Mayberry and Kluender note, studies of L2 in the spoken modality reveal significant effects of education on attainment in L2 (see also Birdsong, 2014; Hartshorne et al., in press). To date, the role of education in L2 ASL has not been widely researched, and systematic comparisons of different educational experiences would be welcome.

References

- Birdsong, D. (in press). Plasticity, variability and age in second-language acquisition and bilingualism. *Frontiers in Psychology*.
- Birdsong, D. (2014). The Critical Period Hypothesis for second language acquisition: Tailoring the coat of many colors. In M. Pawlak & L. Aronin (Eds.), *Essential topics in applied linguistics and multilingualism. Studies in honor of David Singleton* (pp. 43–50). Berlin: Springer.
- Birdsong, D., & Molis, M. (2001). On the evidence for maturational effects in second language acquisition. *Journal of Memory and Language*, 44, 235–249.
- Emmorey, K., Giezen, M., & Gollan, T.H. (2016). Psycholinguistic, cognitive, and neural implications of bimodal bilingualism. *Bilingualism: Language and Cognition*, 19, 223–242.
- Emmorey, K., Petrich, J. A. F., & Gollan, T. H. (2013). Bimodal bilingualism and the frequency-lag hypothesis. *Journal of Deaf Studies and Deaf Education*, 18, 1–11.
- Hartshorne, J. K., Tenenbaum, J. B., & Pinker, S. (in press). A critical period of second language acquisition: Evidence from 2/3 million English speakers. *Cognition*.
- Mayberry, R. I., & Kluender, R. (2017). Rethinking the critical period for language: New insights into an old question from American Sign Language. *Bilingualism: Language and Cognition* doi:10.1017/S1366728917000724
- Morford, J. P., Wilkinson, E., Villwock, A., Piñar, P., & Kroll, J. F. (2011). When deaf signers read English: Do written words activate their sign translations? *Cognition*, 118, 286–292.
- Supalla, T., Hauser, P. C., & Bavelier, D. (2014). Reproducing American Sign language sentences: Cognitive scaffolding in working memory. *Frontiers in Psychology*, 5.
- Vanhove, J. (2013). The critical period hypothesis in second language acquisition: A statistical critique and a reanalysis. *PLoS ONE* 8(7):e69172.
- Veríssimo, J., Heyer, V., Jacob, G., & Clahsen, H. (2017). Selective effects of age of acquisition on morphological priming: Evidence for a sensitive period. *Language Acquisition*. <https://doi.org/10.1080/10489223.2017.1346104>.