

The critical period hypothesis: A diamond in the rough

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For several decades now, research on the acquisition of ASL and other signed languages has contributed to our understanding of language acquisition and of age effects in particular. A strong decline in learning capacity with age has been shown in numerous studies with ASL as L1, and the age range for this critical period phenomenon appears to be very similar to what has been observed in even more studies in L2 (for both spoken and signed languages). Mayberry and Kluender (Mayberry & Kluender) argue that the two phenomena are quite different, however, to such an extent that the concept of a critical period is not applicable to L2. Their two main arguments are that L2 learners are less affected by late acquisition than L1 learners and that some L2 studies have not shown the kind of discontinuity in the age-proficiency function that is predicted by the concept of a critical period. As space is very limited, I will limit my comments to these two issues.

How similar is the age-related decline in L1 and L2 acquisition? Mayberry (1993) showed that the shape of the age-proficiency function was similar for L1 and L2 (even though the effect was stronger for L1). In their keynote here, they stress the second point and all but ignore the first one. It may be true that there are coarse anatomical differences between late L1 acquirers on the one hand and early L1 or late L2 acquirers on the other, but that does not mean no fine-grained differences exist between early L1 and late L2 acquirers. In DeKeyser (2012) I showed that, even among the studies controlling for proficiency, the majority found differences between early L2 and late L2 with ERP and neuroimaging. The neuroscience data, then, correspond with the behavioral data: a bigger impact of late acquisition on L1 and a smaller one on L2, but both show essentially the same correlation between age and ultimate attainment. It is more parsimonious, then, to attribute both correlations to the same phenomenon, and to attribute the bigger absolute size of the impact in L1 to the fact that, to use Johnson and Newport's terminology, the critical period has both a maturational aspect (unavoidable because of age, in spite of earlier successful L1 acquisition, demonstrated rather dramatically in their study) and an exercise aspect (which only shows up when the language

making capacity has barely been used early on for L1, demonstrated equally dramatically in several of Mayberry and associates' publications). Let us not make the mistake again that the otherwise so insightful Lenneberg (1967) made by equating the critical period with gross anatomical changes such as lateralization. Often the age effects in L2 show up in some aspects of phonology, morphology, or syntax, and not in others, so it would be surprising if they could be explained by macro-level differences such as different lateralization or more activation in the occipital-parietal lobe and less in the temporal lobe.

The other point I want to discuss briefly is the shape of the age-ultimate attainment function. While I agree that a "bend in the curve" is required if we want to claim there is a critical period, I disagree with the claim that there is no such bend. As Mayberry and Kluender rightly point out, those who have calculated an age-proficiency correlation for age of acquisition and ultimate attainment through the lifespan have always found a strong negative correlation, but this correlation is meaningless; it does NOT mean that there is some type of decline that continues from birth till death. When the same data are submitted to a separate analysis for different age ranges, the correlations can be quite different, as shown e.g. in Johnson and Newport (1989), DeKeyser (2000), and DeKeyser, Alfi-Shabtay and Ravid (2010). This is simply an example of what is known as the Yule-Simpson effect: the global analysis can easily hide starkly different local patterns, even opposite ones; this is why the effect is also called the Simpson paradox (cf. Blyth, 1972).

In connection with this point, I need to refute a claim Mayberry and Kluender make about DeKeyser et al. (2010). When age at testing (confounded substantially with AoA) was partialled out of the correlation between AoA and proficiency, the correlation for the AoA < 18 group remained strong, but for the 18–40 AoA range it became FAR FROM significant (and if it was significant again for the > 40 group, i.e., the > 50 group for age at testing, that is not surprising; it is well known that mental acuity declines over the years after age 50, and this phenomenon has no light to shed on whether there is a critical period in childhood or not).

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Research over the last few decades has peeled away some layers of misunderstanding about the critical period construct. The critical period phenomenon, however, is not like an onion where nothing is left after peeling off layer by layer, but rather a diamond in the rough, which sparkles more brightly after a good conceptual cleaning.

References

- Blyth, C. R. (1972). On Simpson's Paradox and the Sure-Thing Principle. *Journal of the American Statistical Association*, 67(338), 364–366.
- DeKeyser, R. M. (2000). The robustness of critical period effects in second language acquisition. *Studies in Second Language Acquisition*, 22(4), 499–533.
- DeKeyser, R. M. (2012). Age effects in second language learning. In S. Gass & A. Mackey (Eds.), *Handbook of Second Language Acquisition* (pp. 442–460). London: Routledge.
- DeKeyser, R. M., Alfi-Shabtay, I., & Ravid, D. (2010). Cross-linguistic evidence for the nature of age effects in second language acquisition. *Applied Psycholinguistics*, 31(3), 413–438.
- Johnson, J. S., & Newport, E. L. (1989). Critical period effects in second language learning: The influence of maturational state on the acquisition of English as a second language. *Cognitive Psychology*, 21, 60–99.
- Lenneberg, E. H. (1967). *Biological foundations of language*. New York: Wiley.
- Mayberry, R. I. (1993). First-language acquisition after childhood differs from second language acquisition: The case of American sign language. *Journal of Speech and Hearing Research*, 36, 1258–1270.
- 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