

# STATE OF THE ART DISCUSSION ON THE INFLUENCE OF AGE ON SLA

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*Abstract:* The influence of age on second language learning/acquisition (SLA) has been widely discussed. The critical period hypothesis as proposed by Lenneberg (1967) considered SLA to be deprived after puberty due to hemispheric specialization of functions and loss of brain plasticity. Recent literature, however, shows that adults are capable of acquiring an L2 even though age presents different levels of impact in different areas of language, and pronunciation seems to be the most affected.

*Keywords:* SLA; critical period; pronunciation.

**T**he role that age plays in second language learning/acquisition (SLA) has been the central topic of many studies in SLA for the last four or five decades. The notion of a critical age for learning was brought to this field by Penfield and Robert in 1959 when they claimed that the age of nine was a limit in terms of successful language learning because of physiological constraints such as progressive loss of brain plasticity (BEEBE, 1988; SINGLETON, 2005). However, it was Lenneberg, in 1967, who proposed an onset for learning at the age of two when lateralization should start; thus, it was suggested a critical period (CP) for language learning beginning at two and ending with the beginning of puberty, which was believed to mark the end of lateralization (ELLIS, 1994; SINGLETON, 2005).

Research comparing children and adult language learners identified both advantages and disadvantages for learners within the CP. It was found that concerning speed of learning adults were faster and concerning ultimate attainment

children were able to reach higher levels of proficiency (GASS; SELINKER, 2001; NIKOLOV; DJIGUNOVIC, 2006). Even though children were not identified as better learners at first, in the long run the results corroborated the existence of an age effect. The hypothesis of a CP has been tested in terms of onset and offset, language domain, and its actual existence.

The offsets or terminus ages proposed by Penfield and Robert (age nine) and by Lenneberg (puberty) were not widely accepted without further research. From the late seventies to the early nineties, most studies carried out with the intent of determining the CP terminus were primarily aimed at phonetics/phonology because it is the language domain which seems to be more affected by age; the results, however, were very inconsistent. For instance, Molfese (1977 as cited in SINGLETON, 2005) found an offset for phonetics/phonology at the age of one whereas Scovel (1988 as cited in SINGLETON, 2005) found it at the age of twelve. Ruben (1997 as cited in HYLSTENSTAM; ABRAHAMSSON, 2003) identified an onset for phonetics/phonology at the age of six months and offset at the age of one. Ruben also found an offset of four for syntax and of fifteen or sixteen for semantics. Hyltenstam and Abrahamsson (2003) claim that there is a unified CP terminus shortly after birth for all capacities and conclude that L2 learners never achieve nativelike proficiency.

Scovel (1988 as cited in BIRDSONG, 2006) claims that pronunciation is the only area of language learning which is actually affected by a CP. The author states that it happens for neuromuscular reasons. It is important to point out that nowadays there is no consensus in relation to the exact causes of a CP. As mentioned above, Penfield and Roberts state the cause of a CP is loss of brain plasticity; Lenneberg points to lateralization; Scovel refers to neuromuscular-driven articulatory difficulties; and, there are also non-neurobiological explanations such as Krashen's (1985) "affective filter". There are many other neurobiological, cognitive-developmental, and affective-motivational explanations for the existence of a CP (see SINGLETON, 2005 for a review of these studies).

Up to this point, we have seen that neither causes nor onsets and offsets nor language domain for a CP have left the field of controversy. The only consensus in the area is that age affects language learning and pronunciation seems to be the most affected skill. A more moderate idea of a CP can also be found in the literature – the sensitive period (SP) – after which learning is not simply impossible but only harder; with the idea of a SP comes the belief that there are different SPs for different skills or domains (BEEBE, 1988; ELLIS, 1994). Several researchers, however, do not believe that there is a critical or sensitive period. Below, I will review some studies which clearly indicate that there may not be a CP, just a progressive reduction of general cognitive capacity with age (see BIRDSONG, 2006 for a clear explanation on how the brain loses its capacity with age).

According to Bongaerts (2005), because the commonality between all assumptions made by the proponents of the CP is that it has a starting age and an ending age, its reflections on SLA are

*1. there should be a discontinuity in the slope of the decline in L2-proficiency situated around the terminus of the critical period, and 2. no second language learners starting after the terminus of the critical period should demonstrate achievement of native-like levels of ultimate L2-attainment (BONGAERTS, 2005, p. 259).*

Thus, in order to discard the idea of a CP it is necessary to show a lack of discontinuity in the slope of the decline in proficiency after the end of the CP and the possibility of nativelike attainment by adult L2 learners.

Patkowski (1980 as cited in BONGAERTS, 2005 and FLEGE, 1988) tested the discontinuity in L2 pronunciation proficiency after the age of acquisition of fifteen. The author reported a sharp discontinuity on the slope providing evidence for a CP. However, many other studies were carried out disconfirming Patkowski's findings. Oyama (1976), Birdsong and Mollis (2001 as cited in BIRDSONG, 2006), Flege, Munro and Mackey (1995), and Flege, Yeni-Komshian and Liu (1999) are examples of studies which have shown a systematic decline of proficiency with age – that is, no sharp discontinuity.

The possibility of nativelikeness by L2 learners – the second reflection cited by Bongaerts – has been extensively shown in the literature. For instance, in their famous study with 240 Italian learners of English, Flege, Munro and Mackey (1995) found that 6% of those who were older than twelve when they immigrated to Canada achieved nativelike pronunciation. Bongaerts et al. (1997) showed that Dutch late-learners of English could pass by native speakers and in fact some of them obtained higher rates from four British judges than some of the native speakers – probably due to regional dialect. Marinova-Todd (2003 as cited in BONGAERTS, 2005) found one French, one Slovak and one Russian learner of English who immersed in English at 21 years of age or more and performed at nativelike level on tasks concerning pronunciation, vocabulary, morphosyntax, and language use. Finally, Palliers and colleagues (2003 as cited in BIRDSONG, 2006) studied eight Koreans who were adopted by French couples in Paris at ages three to eight. The subjects were not exposed to Korean after their adoption and assumed French as their native language which was shown by their performance and lack of different brain activation when listening to Korean as shown by functional magnetic resonance imaging (fMRI). Thus, after the age of eight they had not only acquired nativelikeness in French but also lost their L1.

Therefore both linearity in the correlation between age and L2 proficiency and cases of late learners achieving nativelikeness are indicators for a minor role of age in language acquisition than that attributed by the CP hypothesis. Corroborating this conclusion, Moyer (2004 as cited in BONGAERTS, 2005) investigated several variables such as type of motivation, educational experience, language experience, and age and found that age of acquisition was *one* among many factors determinant of ultimate attainment.

Several other studies not aiming at showing that late learners can achieve nativelike pronunciation but simply testing the possibility of new category formation or change in cue-weighting have found promising results. Bradlow et al. (1997), for instance, found that Japanese speakers late-learners of English could learn the distinction between /r/ and /l/ in both perception and production; Wang and Munro (2004) found that Mandarin speakers learners of English could perceive the difference between vowels that were absent from their L1 system; Guion and Pederson (2007) found that English late-learners of Mandarin learned to attend to differences in tone which was a novel perceptual dimension; Callan et al. (2003) showed that not only performance could demonstrate that Japanese late-learners of English can learn to discriminate between /r/ and /l/ but also fMRI indicates different areas of brain activation

before and after training. Birdsong (2006), in fact, stated that phonetic training and L2 exposure may yield high correlations with L2 pronunciation ultimate attainment irrespective of age of acquisition.

The good results obtained from training corroborate the claims of Flege's (1995) Speech Learning Model (SLM) and Escudero's (2005) Second Language Speech Perception model which state that adults can acquire non-native sound categories and L2 experience and L2 exposure will serve as the means for nativelike proficiency. Even though the SLM recognizes that children are more likely to attain nativelikeness, it acknowledges the fact that it might be harder, but adults *can* achieve it as well.

Even with the great amount of evidence against a CP, several researchers still support it. For instance, as a reply to Birdsong's (2006) review and discussion on the studies concerning the non-existence of a CP, Coopmans (2006) counterarguments claiming that what actually matters is not where late L2 learners can get but how L1 and L2 acquisition processes differ. Coopmans (2006, p. 51) believes that "part of the solution [for the problem of language acquisition] will be found in postulating Universal Grammar (UG) as a theory of an innate language faculty". His claim brings us to an issue often associated with the CP hypothesis – the amount and availability of access L2 learners have to the UG. Some researchers see the larger probability of access to UG that children may have as an explanation for a CP.

Schumann (2006, p. 315), another researcher who believes in the CP hypothesis, provides one explanation for the late-learners who achieve nativelikeness in an L2. He claims that "differences in brains are very important when considering critical period issues in [Second Language Acquisition] SLA". Schumann uses Einstein's brain as an example. He states that Diamond and colleagues (1985 as cited in SCHUMANN, 2006) compared Einstein's preserved brain and age-matched controls and found several differences between Einstein's brain and the others. For instance, some structures such as the parietal operculum did not exist, others had different placement and shapes, and his brain was also 15% larger than in controls. Schumann (2006) claims that there are areas in the brain that process language but no specific areas for language. He concludes claiming that differences in the brain can give some late-learners advantage; thus, for these learners, the CP hypothesis would not apply and they would not be adequate as counterevidence for a CP.

Within one year there is going to have passed half a century since Penfield and Robert first claimed that there was a CP for language learning. In this nearly fifty years, a great bulk of the research in SLA was aimed at investigating the CP Hypothesis. The main issues were:

1. onset and offset – no consensus was actually reached, even though most researchers agree that puberty could be a likely offset;
2. language domains – most researchers agree that pronunciation is more affected by age than other language domains;
3. existence – no consensus has been reached so far concerning a period, but age is believed to be an important factor in SLA.

Concerning the existence of a CP, the claim that Schumann makes that differences in the brain are responsible for late-learners' success could be tested

with fMRI. My hypothesis is that his claim would not be confirmed – that is, the “key” to some learners’ success might not be neurophysiologic but experiential – amount of L2 exposure and usage – and motivational – willingness to sound like native speakers.

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Resumo: *Discute-se muito sobre a influência da idade na aquisição de segunda língua e língua estrangeira (L2). O período crítico conforme proposto por Lenneberg (1967) considerava que a aquisição ou aprendizagem de L2 era prejudicada depois da puberdade por causa da especialização e perda de plasticidade cerebral. Estudos recentes, no entanto, demonstram que adultos são capazes de adquirir uma L2 embora a idade tenha diferentes níveis de impacto em diferentes áreas da L2, sendo a pronúncia a mais afetada.*

Palavras-chave: *L2; período crítico; pronúncia.*