

The Implications of the Critical Period on Adult Foreign Language Learning

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Abstract— The Critical Period Hypothesis (CPH) is a theory generally referred to in attempts trying to shed some light on the possible reasons why adults, unlike children, often meet the task of learning a foreign language with such great difficulty and different degree of success. The theory was originally proposed by Penfield and Roberts in 1959 but it owes its widespread popularity to Lenneberg and his work that occurred some years later in 1967. What must be pointed out is that initial research that led to the development of the CPH only included first language acquisition but has subsequently been extended to the acquisition of a second language. It may be noted that ever since the theory was first put forth it has raised a great deal of controversy since researchers in the field of language acquisition seem to be unable to reach a common ground in efforts to pinpoint the underlying causes of the CPH, its offset point and language capacities affected by the CPH. Nevertheless, there are researchers who claim that the theory lacks credibility due to its manifold interpretations. The paper sets out to provide some insight into the most relevant scientific research trying to explain why children tend to achieve perfect mastery of a second language whereas the same task is met by adults with general lack of success.

Index Terms— adult foreign language learning, critical period, language acquisition.

I. INTRODUCTION

Foreign language learning is generally thought to be a time-consuming process which negatively correlates with the age of learning onset. Accordingly, most people hold the view that there are few if any late learners who achieve native-like proficiency which is consistent with "the younger the better" generalization. There is considerable research evidence suggesting that the ability to acquire a second language is limited by age constraints. This widespread belief has led to the fact that adult language learners frequently feel discouraged or renounce even trying to learn a foreign language. Empirical evidence undoubtedly shows that young learners perform better in the long run but this does not necessarily mean that adults have little or nothing to hope for since there are exceptions to this general rule which include adult bilinguals who started learning well into adulthood.

II. THE CRITICAL PERIOD HYPOTHESIS

Attempts to explain why children inevitably achieve perfect mastery of a second language while adults tend to show considerable differences in the degree of success, rest upon a theory that there is a critical period for language acquisition. The term *critical period* is used to denote a time during which language learning is a relatively easy task with uniform success. After this period, which is believed to end at the onset of puberty, there are poor chances, if any, for an average learner to achieve native-like fluency. Originally proposed by Penfield and Roberts [14], the Critical Period Hypothesis (CPH) is generally considered to have a 'father' in Lenneberg and his work that occurred some years later [10].

Penfield based his conclusions on research studies that compared recovery prognosis of adults and children who suffered from injury or disease damage of speech areas in the dominant hemisphere, and then met with a different degree of success transfer of speech mechanisms from the injured hemisphere to the healthy minor hemisphere. Considerable body of experimental data suggests that language functions can subsequently become fully developed in other parts of the brain, adjacent to the place of injury, provided that the tissue is damaged prior to the onset of puberty. Once the critical period is over, "the damage results in permanent irreversible impairment" [7]. In terms of learning languages, after the age of nine, brain loses its neural plasticity and growth potential, consequently becoming too rigid to allow successful language learning to occur. While

conducting his research independently, Lenneberg comes to similar conclusions and makes a step forward by proposing not only the point at which the critical period ends, but also claims that it has its starting point at the age of two. Based on then-current scientific research, as the underlying cause for the critical period he offers the process of lateralization, during which specialized capacity for language functions develops in the dominant hemisphere of the brain. He indicates that lateralization process begins around the age of two and is thought to be completed by the age of thirteen or around puberty. During this cerebral lateralization process, language functions such as speech comprehension, speech production and verbal memory become fully developed and fixed within the left hemisphere of the brain, thus becoming less susceptible to acquiring new skills after adolescence.

Lateralization theory seen as one of the possible explanations of the CPH has been further extended to having more than one completion point for different language functions. Functions that seem to be time-sensitive to a much greater extent than others are those of phonetic/phonological character. This view, held by a number of researchers such as Molfese [13], Seliger [18], Scovel [17], Long [11], etc., supports the idea that CP for phonetics/phonology comes to its offset much earlier than those for morphology, syntax and semantics. Different authors propose different termini for particular domains of language but it can be concluded that if being exposed to L2 after the age of 12 one could never acquire native-like accent.

Apart from decreased cerebral plasticity and lateralization, there are other possible causes that underlie the CPH proposed in literature that also find ground in neurobiology. According to Seliger [18], within the process of lateralization the process of localization takes place, during which, specific language functions become localized in the dominant hemisphere. The one being localized by puberty is phonological one, while those in relation to morphology and syntax undergo the process later in life, hence allowing related language skills to be developed to native-like levels after the critical period for phonetics/phonology is over. Modern brain-imaging technology has revealed that in early bilinguals activity in a single brain area is detected for both languages whereas there are two distinct but adjacent areas of activation in late bilinguals. Yet, it still remains inconclusive what effects those different spatial representations in the brain have on the level of second language proficiency.

There are researchers who while favoring the CP concept deny its connection with neurobiology but rest upon some evidence of cognitive-developmental character. Krashen [9] and Felix [5] emphasize the importance of the formal operations stage arguing that general problem-solving cognitive structures arising at this stage of brain development stand in the way of innate language learning mechanisms thus hindering L2 acquisition by adults. This innate capacity operates through access to Universal Grammar (UG), "a mental matrix for language skills" based on formal similarities among natural languages [10], still available to children due to their cognitive immaturity. According to Felix's Competition Model [5], intact UG system starts competing with the developing cognitive mechanisms which eventually "take the victory". As a result, adults are denied access to UG and hence lose the ability to learn languages instinctively. This further implies that adult language learning is fundamentally different from child language development. Bley-Vroman [3] firmly takes this standpoint claiming that adult language learning is controlled by general human cognitive learning capacities whereas child language acquisition is in control of domain specific acquisition system which allows their unconscious internalization of knowledge. The position that different processes underlie child language acquisition and adult language learning offers a rather plausible explanation for the fact that adults meet this task with such different degrees of success against uniform success in children. The use of certain mature cognitive mechanisms instead of innate language faculty is not only inappropriate in terms of learning languages but makes it virtually impossible. Bley-Vroman even suggests that "... the rare success may have the same 'pathological' status for adult acquisition as the rare failures in first language acquisition are considered to have" [3].

It may be noted that researches see the lack of adult use of language acquisition device to have different explanations. Some maintain the idea that language learning faculty remains intact, but as children mature "... its function is impeded by child's increasingly sophisticated cognitive abilities" [12]. On the other hand, there are those who favour the "use it then lose it" version claiming that once the language learning faculty has been used for first language acquisition, in evolutionary sense it is no longer economical to retain it since it has served its purpose [12]. Finally, there are researchers who argue that the language learning faculty atrophies because after first

language acquisition is completed, this device is no longer used [1]. This, so called "exercise hypothesis" promotes the idea that people wouldn't be deprived of their innate language learning mechanisms if they continued to use them through adulthood.

There is yet another perspective from which the CPH is frequently viewed in terms of its underlying causes, placing the affective-motivational factors in its centre. Krashen [9] proposes the concept of "affective filter" which prevents the input of a second language to which the learner is exposed to reach the language acquisition device due to the onset of formal operations stage. It is rare for this learner-internal filter to exist in children but in adults it is strong enough to prevent native-like attainment. This hypothesis draws on undeniable influence of factors such as motivation, attitude, self-image, ego and alike on adult language learning. These factors are seen as anxiety provoking and are often associated with the sense of shame or feeling of uneasiness especially when it comes to speaking a foreign language in front of other people. Children, unlike adults, are not afraid of making mistakes or being judged by others hence affective factors are considered to play a far less inhibiting role in children language development than it is the case with adult language learning.

Another researcher working in this framework is Guiora [19], who was the first to propose the notion of "language ego", claiming that ego boundaries become stiff during the maturation process. The consequent state of mind is not appropriate for foreign language learning since this task "requires the taking on of a new identity and that in order for this to happen, language ego boundaries have to be permeable, which, typically, they are not in the adult" [19]. In his attempt to explain age-related differences in connection with language learning, Schumann [16] introduces the Acculturation Model according to which an individual is more likely to learn a foreign language if social and psychological differences between L1 and the target language are not seen as far apart. These conclusions are based on his findings that children are less prone to express hostility towards foreign cultures than adults.

As it was already mentioned above, multiplicity of CPs arises not only from the perspective of possible age-related factors seen to interfere with successful language learning, or exact age when they come into prominence but also from the standpoint of specific domains of language these factors are expected to affect. The idea that pronunciation is a language function most affected by the CP has been around ever since the hypothesis was introduced. Lenneberg in his initial claims found the critical period to affect all language aspects, which is consistent with the views of Long and Hyltenstam and Abrahamsson [8], whereas researchers such as Scovel [17] restricted its implications to the acquisition of accent. Scovel's conclusions implied that pronunciation is a single language function that has a neuromuscular basis and hence a 'physical reality' which prevents learners who start to learn a second language later than around age 12 to speak it without a foreign accent. Flege [6] finds explanation for foreign accents in late L2 learners in the fact that once they have established their L1 sound categories, it is difficult for them to perceive L2 sounds with disregard to those belonging to L1 sound system, especially in the case of L2 sounds that are similar to L1 sounds. Findings like this indicate that the ability to pronounce a second language in a native-like manner is affected or limited by the aging process to that extent that even when learners are able to produce utterances with perfect pronunciation they still do not have native-like control of prosodic features such as intonation, stress and other phonological nuances [15]. As it seems, adults are no longer subject to the same biological endowment as children for acquiring fluency and naturalness in the domain of pronunciation.

Another question raised by researches is whether there is a CP for morphosyntactic competence. Assuming that there is, it is attributed to the intuitive capacity for language that is found in children (UG) but to which adults no longer have access. This built-in grammar enables children to acquire the grammar of whatever language or languages they are exposed to intuitively by natural means and not consciously or deliberately as adults do. Even though children's second language grammar system is influenced by UG, it cannot be hastily concluded that second language and first language acquisition are to be seen as identical, because it is inevitable fact that children's second language development is also influenced by their first language. As it was already mentioned, there are experts who suggest that more general cognitive processes start taking over from UG as children mature. When it comes to UG accessibility in adults, some researchers claim that those learners who started learning second language after puberty have absolutely no access to UG and that such learning is supported by general problem solving mechanisms which are not seen to be affected by the aging process [3]. On the other hand, some of them find maturational

constraints to affect only particular UG aspects leading to different mental representations of syntax in late second language learners such as Hawkins [19]. Another view in no relation to UG is offered by DeKeyser [4] who believes that after puberty it is no longer possible to successfully learn languages through implicit mechanisms only because these language acquiring capacities are the only ones maturational constraints apply to. According to the related research, it is yet not clear whether and to what extent adult learners have capacities deriving from UG available to them.

Yet, in contrast with manifold versions of CPH theories, researchers agree about one thing, which is that vocabulary acquisition is not predicted to cease with age. This equally applies to first language acquisition as well as the acquisition of second or subsequent languages. It can be noted that both native speakers and foreign language learners process semantic information in the same way and throughout life. This consistency can be explained by the fact that the neural circuitry which has the role in processing semantic information and acquiring vocabulary comes in on early in life and remains unaffected by the aging process.

III. CONCLUSION

As Singleton [19] points out, what challenges the credibility of the CPH is the fact that since the theory was first put forth in the 1960s there have been a vast number of interpretations proposing a number of CPH termini, varying CPH explanatory accounts as well as different domains of language the CPH-related effects apply to. The timing of the critical period offered by researchers ranges from one year of age to adolescence, whereas the variations extend to possible explanations of the CPH as they are sometimes found in neurobiology, some find supporting evidence of cognitive-developmental character, while there are those who attribute the CPH to affective-motivational factors. Another CPH critical point refers to the capacities affected by the critical period varying from language acquisition generally, some claiming that it affects either innate or non-innate elements only, to those arguing that after the critical period is over it becomes impossible to learn a language successfully through implicit mechanisms only. This diversity of proposals concerning the CPH can lead to a conclusion that "quite apart from the accumulating empirical evidence against the idea that language acquisition is constrained by a CP, the very fact that there are such manifold and mutually contradictory versions of the CPH of itself calls into serious question the notion of a CP in this domain" [19].

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