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The Critical Period Hypothesis of Second Language Acquisition Theory of Eric Lenneberg's

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Abstract

In second language acquisition, The Critical Period Hypothesis (CPH) holds that there is a **critical time** period for a person to learn a new language with **native** proficiency. This time usually begins around the age of two and ends just before puberty. According to the hypothesis, learning a new language after this critical period will be more difficult and unsuccessful. The crucial phase is the stage of a person's development when their nervous system is primed and sensitive to environmental stimuli, according to developmental psychology. If a person does not receive the appropriate environmental stimuli during this time, their capacity to learn new skills will deteriorate, compromising a variety of adult social functions. If a child does not learn a language during this vital era, they are unlikely to achieve native fluency in their first language. Because of the adaptability of the brain, a person is poised to learn new abilities throughout the critical period. Synapses, or brain connections, are extremely receptive to information. Some researchers refer to the'sensitive period' or 'weak critical period' as a synonym for the critical period. The sensitive phase is comparable to the critical period in that it is characterized by a high level of neuroplasticity and rapid formation of new synapses in the brain. The key distinction is that the sensitive phase is thought to endure longer than puberty, but there are no hard bounds.
Keywords: Critical period hypothesis, Second Language acquisition

1. Introduction

Second-language (L2) learners who begin learning early in life and stay exposed to information and so learn across several years or decades – unquestionably outperform later learners in the long run and in immersion environments. This overall age impact is sometimes used as evidence for a so-called "critical period"(CP) for second-language acquisition, despite the fact that it is misunderstood as an argument in favor of early foreign language training, which occurs in quite different circumstances (SLA). Derived from biology, the CP concept was famously introduced into the field of language acquisition by Penfield and Roberts (1959) and was refined by Lenneberg eight years later. Lenneberg argued that language acquisition should occur between the ages of two and puberty, a period he believed to coincide with the brain's lateralisation process. (Recent neurological research implies that the lateralisation of distinct linguistic functions occurs in different time periods. Most, however, close before puberty by Singleton (2007) However, Lenneberg mostly drew on findings pertaining to first language development in deaf children, feral children or children with serious cognitive impairments in order to back up his claims. For him, the critical period concept was concerned with the implicit "automatic acquisition" in immersion contexts and does not preclude the possibility of learning a foreign language after puberty, albeit with much conscious effort and typically less success.

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The critical period hypothesis (CPH) was embraced by SLA research and applied to second and foreign language learning, yielding a slew of studies. Adult L2 learners are less susceptible to input than child L2 learners, according to the CPH for SLA. The age susceptibility function is thought to be non-linear, which is significant. Beyond this broad definition, the CPH is seen in a variety of ways . This situation necessitates scientists to explain their theoretical positions and assumptions explicitly, but it also has the apparent drawback of critical findings being brushed aside as merely affecting one component of one particular study. This general ambiguity affects two areas in particular: defining the scope of the CPH and formulating testable predictions. It goes without saying that defining the scope and formulating falsifiable predictions are crucial stages in the scientific examination of any hypothesis or theory, but the lack of scholarly consensus on these points appears to be especially severe in the case of the CPH. As a result, this article begins with a quick summary of the many perspectives on these two stages.

Then, after determining the scope of their CPH version and collecting empirical data using reliable methodologies, researchers must thoroughly analyze the data patterns in order to assess the predictions made and draw justified inferences from the findings. However, as I shall explain in great detail, statistical analysis and interpretation of data patterns in CPH research – which includes both critical and supportive studies and overviews – leaves a lot to be desired. Reanalysing data from a recent CPH-supportive study, I illustrate some common statistical fallacies in CPH research and demonstrate how one particular CPH prediction can be evaluated.

2. Literature Review

Defining the critical period hypothesis's application

First, in the literature, the age range for a hypothesized critical time for language acquisition has been defined in a variety of ways. Other academics have set the cut off point at 12, 15, 16, or 18 years of age, although Lenneberg's critical period spanned from two years of age until puberty (which he places at around 14 years of age). Most academics nowadays, unlike Lenneberg, do not designate a beginning age for the key period of language development. Some, on the other hand, believe that the critical period (or a critical period for a specific language domain, such as phonology) could terminate much earlier than puberty (e.g., at age 9 , or as early as 12 months in the case of phonology).

Second, the setting that is crucial to the CPH is still a little hazy. Is the critical period solely applicable to implicit learning processes, such as untutored language acquisition in immersion settings, or does it also apply to (at least partially) taught learning. The majority of researchers agree on the former, but many studies have included people who have received at least some L2 training.

Third, there is no agreement on what the CP's scope is in terms of the domains of language covered. Most experts agree that a CP is most likely to obstruct the acquisition of speech and grammar, hence these are the areas that studies on the CPH focus on.

Finally, rather than focusing on the rate of learning, research into the CPH has concentrated on 'ultimate attainment' (UA), or the 'final' level of L2 proficiency. The CPH cannot hold for the rate variable, according to research. Adult learners appear to progress faster than children in the early stages of L2 acquisition. Though there are theoretical reasons for excluding the rate (the initial faster rate of learning in adults could be due to more conscious cognitive strategies rather than less

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conscious implicit learning, for example), rate of learning could also be considered an indicator of'susceptibility' or'sensitivity' to language from a different perspective.

3.Formulating testable hypotheses

After the extent of the relevant CPH has been established properly, clear and testable predictions must be formed from it. At this point, it becomes clear that there is no consensus on what the implications or actual observable outcome of a CP should be. As previously stated, the end state or 'ultimate attainment' (UA) in L2 acquisition is of importance to CPH researchers because it "determines the upper bounds of L2 attainment" Researchers can study the potential maximum outcome of L2 proficiency before and after the putative key period using the range of possible ultimate attainment states.

Some CPH proponents believe that post-CP learners will be unable to achieve native-like L2 competencies. Finding a single native-like post-CP L2 learner would thus be enough to disprove all of the CPHs who made this prediction. Assessing this prediction is difficult, however, since it is not clear what exactly constitutes sufficient nativelikeness, as illustrated by the discussion on the actual nativelikeness of highly accomplished L2 speakers.

Another major prediction stated by proponents of CPH is that the relationship between age of acquisition and eventual attainment will not be linear throughout one's lifetime. Before discussing how this function would have to look in order to be CPH-consistent evidence, it's worth noting that the ultimate attainment variable is essentially a cumulative measure dependent on the actual variable of interest in CPH research, i.e. susceptibility to language input, as well as other factors like learning duration and intensity (both within and outside a putative CP) and possibly a number of other influencing factor.

To elaborate, as Newport properly points out, the behavioural outcome, i.e. ultimate accomplishment, can be assumed to be integrative to the susceptibility function. Other factors being equal, when susceptibility declines, ultimate accomplishment will decrease. However, falling eventual attainment levels do not constitute persuasive evidence in favor of a CPH on their own. The susceptibility function must therefore be used to estimate the shape of the integrative curve. When other factors are not equal, such as learning length (does learning last till the time of testing or merely for a more or less constant number of years or is it depending on age itself?), the age of acquisition–ultimate attainment function can take almost any shape.

First language acquisition in the critical period

Eric Lenneberg first proposed the Critical Period Hypothesis for language learning in his book Biological Foundations of Language (1967). He claimed that acquiring a language to a high level of competency could only be accomplished during this time. Language acquisition outside of this time frame is more difficult, making native proficiency less likely.

He based his idea on information from children who had particular formative experiences that impacted their capacity to communicate in their first language. The evidence was based on the following cases in particular:

1) Deaf children that didn't develop native proficiency in verbal language after puberty.
2) Children that experienced brain injury had better recovery prospects than adults. It is more likely for children with aphasia to learn a language than it is for adults with aphasia.
3) Children who were victims of child abuse during early childhood had more difficulties learning the language since they were not exposed to it during the critical period.

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Genie, the feral child

As a child, Genie was a victim of domestic abuse and social isolation. This took place from the age of 20 months until 13 years old. She didn't speak to anyone throughout this time and had very little contact with others. As a result, she was unable to acquire adequate language abilities.

She was unable to communicate when officials located her. She learned some language skills through direct instruction over a few months, but the process was gradual. Despite the fact that her vocabulary improved over time, she struggled to grasp fundamental grammar and hold discussions.

Because she was unable to learn a language during the vital era, the scientists who worked with her believed that she would be unable to achieve full linguistic proficiency for the rest of her life. Despite significant advances in her ability to talk, she still had many irregularities in her speech and struggled with social contact.

The case of Genie supports Lenneberg's theory to an extent. However, intellectuals continue to debate this issue. According to some scientists, Genie's development was disturbed as a kid due to inhumane and painful treatment, which resulted in her incapacity to learn a language.

Second language acquisition in the critical period

In the context of second language acquisition, the Critical Period Hypothesis might be used. It applies to adults or children who are native speakers of their first language and are attempting to learn a second. The CPH's key source of evidence for second language acquisition is comparing the capacity of older learners to acquire a second language to that of children and adolescents. In comparison to their older colleagues, younger learners have a comprehensive mastery of the language.

Although adults can achieve high levels of skill in a new language, they frequently retain a foreign accent, which is uncommon among younger learners. Because of the role of the neuromuscular system in speech pronunciation.

Adults are unlikely to develop a native accent because they have passed the essential phase for neuromuscular function learning. Having said that, there are exceptions to the rule, such as adults who reach near-native proficiency in all elements of a second language. As a result, distinguishing between correlation and causation has proven difficult for researchers.
Some claim that CPH does not apply to the acquisition of a second language. Instead of age being the most important component, other factors such as effort, learning environment, and time spent learning have a greater impact on a learner's performance.

Critical Period - Key takeaways

1) The critical period is said to take place in adolescence, typically from 2 years old until puberty.
2) The brain has a higher level of neuroplasticity during the critical period, which allows new synaptic connections to form.
    1) Eric Lenneberg introduced the hypothesis in 1967.

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2) The case of Genie, the feral child, offered direct evidence in support of the CPH.
3) The difficulty adult learners have in learning a second language is used to support the CPH.

3.The Sensitive Period Hypothesis

Lenneberg already suggested in his definition of the CPH the possible extension to second language acquisition (SLA) when he states,

Automatic acquisition form mere exposure to a given language seems to disappear, and foreign languages have to be taught and learned through a conscious and labored effort. Foreign accent cannot be overcome easily after puberty. However, a person *can* learn to communicate at the age of forty. This does not trouble our basic hypothesis. (Hyltenstam & Abrahamsson 2003: 540)

However, some studies maintain a sensitive period hypothesis (SPH) as a modification of the original CPH, based on the findings of additional study showing periods of extraordinary adaptability in the process of maturation are not always abruptly shut off or on, as the CPH maintains. As a result, the SPH proposes:

As in the critical period formulation, the special adaption is thought to occur during an early phase, but in this weaker formulation, the sensitivity does not disappear at a fixed point; instead it is thought to fade away over a longer period of time, perhaps covering later childhood puberty and adolescence. (Hyltenstam& Abrahamsson 2003:556).

Discussion

The **critical period hypothesis** or **sensitive period hypothesis** claims that there is an ideal time window of brain development to acquire language in a linguistically rich environment, after which further language acquisition becomes much more difficult and effortful. It is the subject of a long-standing debate in linguistics and language acquisition over the extent to which the ability to acquire language is biologically linked to age.

The critical period hypothesis states that the first few years of life is the crucial time in which an individual can acquire a first language if presented with adequate stimuli, and that first-language acquisition relies on neuroplasticity. If language input does not occur until after this time, the individual will never achieve a full command of language. There is much debate over the timing of the critical period with respect to SLA (second language acquisition), with estimates ranging between 2 and 13 years of age.

The critical period hypothesis is derived from the concept of a critical period in the biological sciences, which refers to a set period in which an organism must acquire a skill or ability, or said organism will not be able to acquire it later in life. Strictly speaking, the experimentally verified critical period relates to a time span during which *damage* to the development of the visual system can occur, for example if animals are deprived of the necessary binocular input for developing stereopsis.

Preliminary research into the Critical period hypothesis investigated brain lateralization as a possible neurological cause; however, this theoretical cause was largely discredited since lateralization does not necessarily increase with age, and no definitive link between language learning ability and lateralization was ever determined. A more general hypothesis holds that the critical period for language acquisition is linked to the interaction of the prolonged development of the human brain after birth and rearing in a socio-linguistic environment. Based on studies of the critical period for development of the visual system, this hypothesis holds that language-specific neural networks are constructed by the functional

validation of synapses that are specifically activated by exposure to a linguistic environment early in life. Humans are uniquely capable of language due to the genetically determined size and complexity of the brain and the long period of postnatal development, during which the environment can select neuronal circuits that facilitate language. Recently, it has been suggested that if a critical period does exist, it may be due at least partially to the delayed development of the prefrontal cortex in human children. Researchers have suggested that delayed development of the prefrontal cortex and an associated delay in the development of cognitive control may facilitate convention learning, allowing young children to learn language far more easily than cognitively mature adults and older children. This pattern of prefrontal development is unique to humans among similar mammalian (and primate) species, and may explain why humans—and not chimpanzees—are so adept at learning language.

The discussion of language critical period is complicated by the subjectivity of determining native-like competence in language, which includes things like pronunciation, prosody, syllable stress, timing and articulatory setting. Some aspects of language, such as phoneme tuning, grammar processing, articulationcontrol, and vocabulary acquisition have weak critical periods and can be significantly improved by training at any age. Other aspects of language, such as prefrontal synthesis, have strong critical periods and cannot be acquired after the end of the critical period.

4. Conclusion

The critical period theory is still a contentious topic in second-language acquisition psycholinguistics. The dependability of empirical data on the tenability of the CPH is frequently discussed, and such methodological critiques are, of course, highly desirable. Furthermore, the dispute frequently revolves around whatever version of the CPH is being defended or refuted. The key differences between these versions are in their scope, notably in terms of the appropriate age range, scenario, and language area, as well as the testable predictions they make. Even when the scope of the CPH is clearly defined and its major prediction is stated explicitly, the question remains as to how much empirical evidence can be marshaled in favor of the relevant CPH. As I demonstrate in this paper, empirical data has frequently been used to support CPH versions that predict that the relationship between age of acquisition and ultimate attainment is not strictly linear, despite the fact that the most commonly used statistical tools (notably group mean and correlation coefficient comparisons) were, to put it bluntly, irrelevant to this prediction.

I'd like to end this paper on a positive note. Even though I have stated that the analytical techniques used in CPH research are often lacking, the original data is, hopefully, still available. This gives academics, both proponents and opponents of the CPH, a unique chance to reanalyse their data sets using the tools described in this study and publish their findings at a low cost of time and resources (for instance, as a comment to this paper). As a result, I would encourage scholars to revisit their previous data sets and share their findings freely, for example, by willingly posting their data and computer code alongside their articles or comments. Supporters and opponents of the CPH should work together to develop a protocol.

References

Abrahamsson N, Hyltenstam K (2009) Age of onset and nativelikeness in a second language: Listener perception versus linguistic scrutiny. *Language Learning* 59: 249–306.

Bald, J. (2007). *Using Phonics to Teach Reading and Spelling.* London: Paul Chapman Publisher.

Lenneberg EH (1967). Biological foundations of language. New York: Wiley.

Penfield W, Roberts L (1959). Speech and brain mechanisms. Princeton: Princeton University Press.

Singleton D (2007). The critical period hypothesis: Some problems. *Interlingüística* 17: 48–56. [Google Scholar]