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■ REVIEW ARTICLE

# Critical Periods In Language Acquisition

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ABSTRACT: Were you able to read and understand what that foreign word means? If not, it is never too late to start learning a new language. However, is it possible to become fluent in a foreign language despite the age at which you start? To answer this question this paper delves into the critical periods in language acquisition and their importance. This paper highlights infants' gradual acquisition of different aspects of language, such as phonemes, words, and grammar. To conclude the importance of critical periods, I compare different strategies for infants and adults learning a language, referring to the example of German word order acquisition. Furthermore, this paper focuses on second language learning. It gives some successful examples of perfectly acquired language by foreigners beyond childhood and highlights the phenomenon of exposure to a native-speaking environment. Additionally, I will discuss the degree of plasticity after the critical period ends and some challenges learners might experience when acquiring a second language. In conclusion, this paper offers a comprehensive review that contributes to our understanding of language development and its implications for language learning beyond childhood.

KEYWORDS: Behavioral and Social Sciences; Cognitive Psychology; Language Acquisition; Critical Periods.

## ■ Introduction

Since childhood, we are normally exposed to either one or more languages. This early exposure guarantees effortless learning and fluency as we age. Have you ever considered why you use this grammar structure or specific word in your native language? Probably not, as your speech flows effortlessly. This phenomenon of fluency is due to early exposure to language acquisition, but not everyone is lucky to have that.

A girl called Genie was found after more than 13 years of isolation, unsocialized and unlearned. When she was discovered, she did not speak. Although, after 27 months of Genie's emergence, she could produce three-word and negative sentences, she could never acquire English perfectly because she missed the critical periods of language acquisition.[1]

This case has brought to my attention the importance of a critical period, a phenomenon explored through the Critical Period Hypothesis (CPH). The Critical Period Hypothesis (CPH) has two interpretations. The first states that the ability to learn a language is influenced by the age at which one starts, with those who start young performing better. The second interpretation suggests that our neural plasticity declines as we age, making it harder to acquire new languages.[2]

To begin with, the first Critical Period Hypothesis was suggested by Penfield and Roberts in 1959, where they proposed that there is a certain period in which people can acquire a language that sounds "native."[3] Later, Lenneberg developed this hypothesis and suggested a specific time frame in which language is acquired more easily and accurately, with a clear beginning and end. According to Lenneberg (1967).[4] The critical period for language acquisition starts after a certain level of brain maturation and ends with reduced cerebral plasticity. He proposed that the process of naturally acquiring a first or second language through exposure occurs during a critical period that starts at the age of two and ends at puberty.[5]

However, subsequent research has challenged Lenneberg's proposed timeframe. A study by Kinzler & Spelke (2005)[6] observed 6-month-old infants exposed to bilingual speakers of English and Spanish; intriguingly, the infants preferred the woman who spoke in English, their native language. This finding suggests that significant language skills are acquired by age two, challenging the idea of a late critical period offset. Furthermore, research has revealed that certain aspects of language acquisition begin in the first days of life and may even commence in the prenatal stage.[5]

This review paper aims to emphasize the importance of early language acquisition. It gives a timeline for acquiring different aspects of a language: phonemes, words, and grammar. To illustrate the significance of early language acquisition, I will compare the processes of learning German word order in infants and adults. I will address pertinent questions, such as the termination of the critical period and the difference in the language acquisition process between infants and adults.

## ■ Discussion

### *Critical periods in language learning early in life*

#### *1.1 Phonemes:*

From the beginning of life, a baby is surrounded by all sorts of sounds – beeping hospital machines, chirping birds, and toy rustles. Babies start as "universal listeners," meaning they are super sensitive to sound changes, even between languages they have not heard before. This suggests that babies could learn any language as long as they first get the hang of phonemes – the building blocks of language that tweak word meanings.[7]

For example, English speakers quickly know that "pear" and "bear" mean different things. But if you are a native Japanese speaker, you might not hear a difference between English sounds like /r/ and /l/, which are not differentiated in Japanese.[8] It turns out that where these sound boundaries happen can vary depending on the language. Learning a language helps



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babies get better at recognizing sounds near these boundaries. At first, babies can tell apart different sounds at just 6 months old, but this ability to hear differences in various languages starts to fade by 12 months. Scientists think that between 6 and 12 months, babies begin paying attention to the different sounds they hear in the language around them. This helps them figure out their language patterns, which is a big step in learning to talk.[7]

***1.2 Words:***

Once children grasp phonemes, they start forming what we call "words." But how do they do this? Children learn without even realizing it. Studies have found that American babies can tell apart different markers that indicate where words start and end in their language. These markers include things like how sounds are distributed, which combinations of sounds are allowed, and where the stress is placed in words.[9]

It is fascinating that even at just two months old, babies can tell the difference between pairs of words that sound different, like "nitrate" and "night rate."[10] As they get a bit older, between 6 and 9 months, babies start to like hearing the sounds they are used to in their language.[11] When they reach 9 to 10.5 months, they begin to rely on the typical stress pattern in their language to group sounds into word-like units and remember familiar sound sequences.[12]

Some studies suggest that by the time they are 18 months old, most kids have already grasped around 150 words and can say about 50 of them.[7] This shows how kids crack the code of language early on without knowing they are doing it.

***1.3 Grammar:***

The classic book by Dr. Roger Brown (1973)13 assumes five key periods of grammar acquisition:

1. Between 12 to 24 months, children begin by using single words and then form short very simple sentences.

2. Between 24 to 30 months, children acquire more basic grammatical structures, so they start forming more complex sentences, for example, talking about the past.

3. Between 30 to 36 months, pluralization and basic word order appear the same as conjunctions.

4. Between 36 to 48 months, children start using complex sentences, various sentence structures, questions and negations.

5. After 48 months, children fully attain the whole grammatical structure of a language.

To compare how young people and adults learn the same grammar, I use the example of German word order acquisition. When children learn German as their first language, it is quite different from how adults pick it up as a second language.

For children, their native language comes naturally, thanks to inborn language principles and general learning strategies.[14] The child can generate abstract hypotheses about the underlying structure of the language it encounters. Therefore, they effortlessly learn the complex rules of word order in German.[14]

Conversely, adults lean more on general learning tactics when tackling German as a second language. The specialized principles of the Language Acquisition Device, which guides first language learning, might be less dominant in adults. Instead, grown-ups often consciously learn rules and patterns through explicit instruction. Moreover, second language learners create a rule system that is far more complicated than the native system.[14]

This distinction in approach shapes how kids and adults master German word order. Children blend innate principles with general learning, while adults rely more on conscious rule learning. All these studies outline the sequence of language acquisition in infants, beginning with phoneme acquisition and progressing to mastering grammar. They underscore the distinct approaches taken by adults and infants in language learning. Furthermore, these studies emphasize the significance of the critical period. For instance, considering the case of learning German word order, it becomes evident that non-native speakers employ more complex strategies that only sometimes ensure flawless acquisition.[14]

***Learning a language beyond a critical period***

***2.1 Second language acquisition:***

The Critical Period Hypothesis states that after a certain age, learners of a second language cannot acquire the same level of fluency as a native speaker. After exploring Genie's case, a girl who was found after being isolated for 13 years of her life, scientists assumed that the window of opportunity for language acquisition closes at puberty.[15] However, some implications of learning a language after the end of the critical period are still possible. Second language learners need to put in a higher level of conscious effort compared to the initial phases of language acquisition. Additionally, they may use different strategies compared to the native speakers (as was compared in the German word order acquisition).[16] According to Feldman (2009)[17], as cognitive development progresses, the conscious and deliberate aspect of learning increases in all areas.

However, some aspects of a language, like phonemes, could be more challenging for non-native speakers to acquire. If learners are exposed to a new language after age 12, they will have an accent because of the inability to acquire the phonetics of a second language.[18] Also, for second language learners to reach the level of a native speaker in the morphology and syntax of a language, exposure to it must begin before age 15.[16]

To conclude, acquiring a language later in life is possible but might require much effort. Therefore, critical periods are not that critical but rather are sensitive.

***2.2 Degree of Plasticity after the End of Critical Period:***

In many well-studied cases, critical learning periods gradually become less flexible as they end. During this closing period, learning becomes only partly successful, and it responds mainly to strong stimuli (favored factors that can still trigger some level of learning when the critical learning period is closing, and plasticity is declining). For instance, in the case of auditory localization in barn owls, they can fully adapt to having one ear plugged at a young age. However, as this plugging happens later, such as during adolescence, the error correction lessens. Ultimately, adult barn owls show a limited ability to correct for these plugs.[19]

Likewise, sparrows can learn from other sparrows' recorded songs for about fifty days of age, but even after that, they can continue learning from a real, live teacher. The amount of learning compared to when they were exposed to the songs

depends on whether the influences were strong and preferred or weaker and less favored. This difference in how good the influences are and the degree of plasticity (how much they make our brains change) might make it seem like there are two timelines for the critical period.[20]

***2.3 The phenomenon of exposure in a native-speaking environment:***

It was interesting to discover that the impact of exposure to a new language in a native-speaking environment outweighs the significance of the age at which one starts learning a second language.[21] Even more unexpected was that learners who get much input from native speakers tend to reach almost native-level skills in the language. For instance, a study found that adults who started learning a language later in life but had more than 20 years of good exposure to English achieved native-like results in vocabulary tests for about 76% of the participants.[22] Therefore, the critical period for language acquisition extends its effects to second language acquisition.

From these studies, getting a good dose of native-speaker input plays a big role in getting close to fluent in a second language.

***2.4 Individual Success in acquiring a language beyond the Critical Period:***

One of the best examples is Joseph Conrad. A native Polish speaker who learned English at eighteen achieved fluency in English after a couple of years of practice.[23] From the above example, we can see that even as adults, it is possible to become proficient language learners. While the average outcome may be lower, some exceptional learners have a natural talent or strong analytical skills. Learning a second language as an adult is not entirely unfamiliar, as languages often have similarities. [20]

## Conclusion

Considering the differences in how we learn languages at different life stages, it is clear that critical periods have a big impact. Sensitivity to timing in language learning is paramount, as early exposure is key to achieving higher proficiency levels. When we are born, we are like language sponges – ready to soak up multiple languages with enough exposure. That is what is called an innate 'universal' learning capacity. The more we are surrounded by a language, the more fluent we become. The gradual nature of infant language acquisition is noteworthy, with native-like proficiency often reaching around four.

Sometimes, adults manage to learn a new language even after the critical period ends due to long-time exposure to the language native-speaking environment. Illustrated by the example of German word order acquisition, where L2 learners develop more complex learning techniques, mastering a language during the post-critical period remains feasible. While employing different acquisition techniques than infants, adolescents still benefit significantly from early exposure. This early immersion plays a paramount role in language acquisition, avoiding challenges such as pronunciation and syntax acquisition.

Regardless of age, I advise those contemplating learning a new language to immerse themselves in an environment where the language is spoken consistently. Full-on immersion proves instrumental in making the language learning process smoother and more effective.

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