Language Acquisition Device (LAD)

Esha Raut *,1

*Department of Humanities, Illinois Institute of Technology, Chicago, IL 60616, USA

Introduction

Mastery of language is a concept many linguists have theorized about. From these theories have come views that have gained great popularity. One comes from psychologist B.F. Skinner, who believed that the facets of language learning followed what he called operant conditioning: unconnected language, or operants, can acquire connections by certain stimuli such as a specific environment. These connections can occur as a result of conditioning, where responses are met with reinforcement depending on how appropriate they may be to that situation or environment (Cowie, 2017).

Linguist Noam Chomsky argued against this view with his theory. Chomsky defined language as an infinite sequence of word forms with grammar as a filter for the correct grammatical sequences (Hausser, 2004). He argued that language mastery didn't necessarily require a stimulus, as any words can be spoken regardless of environment or other factors. Additionally, language doesn't necessitate reinforcement as people say things they haven't before (Cowie, 2017).

Chomsky theorized about the language acquisition device (LAD), which specifies that the human brain has a special language faculty that is dedicated to mastering language (Cowie, 2017).

The Language Acquisition Device (LAD)

Chomsky argued that the language acquisition device contains innate knowledge of linguistic rules, constraints, and principles (Cowie, 2017). As exposure to language grows throughout one's childhood, also known as the primary linguistic data (*pld*), more linguistic data is gained, and thus knowledge is contributed to that what was innate (Cowie, 2017). To learn a language, a child must be able to comprehend and utilize grammar with the pld they have (Chomsky, 2015). However, more recent researchers have argued that the *pld* was too broad to be picked up during childhood (Cowie, 2017). Plato's problem also questions how children can learn a language with poor input (Gelderen, 2014).

In the past, when many language theories were in development, some considered language to be genetic (Gelderen, 2014). However, Chomsky states that the language acquisition device does not predispose a child to learn one language over another, but actually allows the child an innate human faculty to develop any language in that environmental exposure (Chomsky, 2015).

Chomksy (2015) has argued against the oversimplification of the language acquisition device. The LAD has been thought to be reducible to a "conceptual minimum," based on a child's foundational discovery of what is abstract in the deeper theory of grammar. However, Chomsky states that the diversity of language is too rich

for a child to simply absorb with only this minimum.

Poverty of the Stimulus

The argument for the Poverty of the Stimulus concept states that children don't have enough experience with language to fully absorb all core aspects, so an innate, biological factor is responsible for the mastery of language (Chomsky, 2015; as cited by Cowie, 2017). It specifies that infants and children don't hear language that substantially allows them to pick up the grammatical structures important to all grammatical sentences of a language (Shatz & Hoff, 2007).

The language acquisition device has knowledge about human languages that prevents most grammatical formulizations, specifically those incorrect. Complex auxiliary sentences, which include such phrasing as "might have been," are rare in *pld*, and children get competence without relevant experience (Chomsky, 2015; as cited by Cowie, 2017).

Criticisms of the Poverty of the Stimulus include linguistic as well as philosophical arguments. One such criticism states that one's conception of what they have learned affects their view of what they believe they must learn. Additional criticism questions the extent of the innate *pld*, as well as other aspects of the poverty of the stimulus (Cowie, 2017).

Universal Grammar (UG)

Chomsky and other nativists maintain that children are born knowing the Universal Grammar (Cowie, 2017; Gelderen, 2014). The UG is the established innate faculty that allows humans to create grammar, or a set of rules for a language (Gelderen, 2014). This innate universal grammar provides children with the general structure behind all human languages, which is modified as exposure to specific language(s) increases (Halpbern, 2015). It also prevents errors based on principles that cause strict restraints on theorizing the language (Cowie, 2017). This process allows children to establish the grammar of the language they have experience with (Halpbern, 2015). Language learners have most language rules and principles innately, but experience is needed for some to be fully known and best utilized (Cowie, 2017).

Critical Period vs Sensitive Period

Another aspect of Chomsky's Language Acquisition Device was what he called the critical period: the time during which certain inputs must be received to form a relevant competence. If those inputs aren't received, that level of competence is permanently lost. There is little evidence for the critical period. However, there is a large amount of evidence for the sensitive period. The sensitive period is the development period when competence is acquired naturally (Cowie, 2017).

Different studies and research justify and compare the relevance between the critical and the sensitive period. The main theories lie behind trauma that affects language learning and/or recovery, children deprived of language who are also known as "wild children," and the acquisition and proficiency of adults and children who learn a second language (Cowie, 2017).

Language Trauma

There are differences in the recovery of language after trauma between young children, older children, and adults according to conducted studies. Young children are not guaranteed to recover language after a serious injury to the left and right hemispheres, but outcomes differ. Older children, including those who may not have learned the language as successfully, have been found capable of recovering substantially from left hemisphere trauma. Research notes their learning beginning from scratch as adolescents. Adults who suffer trauma in the left hemisphere language areas are seen to recover language to a degree of proficiency, with most recovering competence substantially, helped by treatment. The point for recovery is speculated to be due to the regeneration of damaged speech areas and compensation in other areas of the brain, specifically the right hemisphere (Cowie, 2017).

"Wild Children"

A "wild child," in research practices, is defined as a child whose development was stopped due to abuse, malnutrition, and other environmental causes that also factor into extreme linguistic deprivation. Linguistically deprived children are still being studied, and though more literature is in progress, outcomes vary, and explanations have yet to be found, especially regarding the importance of the critical compared to the sensitive period (Cowie, 2017).

Second Language Acquisition

Studies on second language acquisition in regard to the critical period have been conducted, such as the English performance of immigrant adults based on when they arrived to the United States. Adults who arrived prior to puberty were found to perform better. However, new studies also find that other factors like education, length of residence in that country, and more affect proficiency in the second language. Due to many adults and children having high proficiency in both first and second languages, there is more support in favor of the sensitive period for language acquisition, specifically noted to be the time from age 1 to 6 or 7 years old that language is acquired most easily and naturally, such that native proficiency is most likely to develop (Cowie, 2017).

The Neuroscience Basis

Cowie (2017) states that there is little support for the neuroscience basis of the language acquisition device. The popular view in the 19th century was that language was localized to specific areas of the brain, typically the left hemisphere, and innate to those areas. However, research has found that neural localization of function can occur due to any development and isn't necessarily due to innate ability. Language processing occurs throughout the brain, and even linguistic-focused areas are involved in non-linguistic-focused tasks.

In accordance with the Language Acquisition Device, the nativist view of language believes the brain to be prewired, or set up, by genes. However, data indicates that complex functions can still occur in prewired areas of the brain to do something different, despite their genetic foundation. This suggests that these abilities like that of language are more so learned, alongside the prewiring of the whole cortex (Cowie, 2017).

It should also be noted that the Universal Grammar Area in the brain has also been searched for, but has not been found (Halpbern, 2015). While there is little support in terms of brain activity and structures for the language acquisition device, this nativist theory should still be considered for the development of the brain and is still applicable to how language develops among other stronger arguments (Cowie, 2017).

Language Evolution

Chomsky provides little insight into how the inborn knowledge of language has evolved as language has. Language, as a mechanism, has many functions adaptable and beneficial to human survival, but the favorability of how the certain language acquisition device humans hold came to being is difficult to puzzle together (Cowie, 2017).

Cowie (2017) speculates that as a part of linguistic nativism, natural selection might have built the LAD with knowledge of UG, which ultimately selected as it helped humans with linguistic proficiency and thus improved their fitness for survival. Additional arguments from Briscoe (2000) present the possibility of genetic assimilation in support of this theory, such that the current LAD in human beings is due to the selection of individuals more capable of using it as a resource longer in their lifetimes.

In discussing language evolution, it's important to differentiate what Hauser, Chomsky, and Fitch (2002) as cited by Cowie (2017) call the faculty of language in the narrow sense (FLN) from the faculty of language in the broad sense (FLB). The FLN is defined as the "abstract linguistic computational system alone," which means it contains the parts of the human ability to use language for only language. The FLB consists of the FLN as well as other systems, such as those biological, for example, which contribute to language acquisition and use. The human FLB is speculated to be of importance due to the FLN, as it is the only system not shared with other systems in various other creatures.

FLN is stated to have recursion: the ability to categorize linguistic objects into hierarchically organized classes and thus generate an infinite number of sentences out of a many, but a finite number of words. The development of recursion is left to question, however, and the answer is argued to come from normal biological methods (Hauser, Chomsky, and Fitch 2002; as cited by Cowie, 2017).

Criticisms to this argument pose two main arguments. The first states that the evidence of recursion being specific to the human FLN cannot be the case as it is not species specific. The second argument states that recursiveness is not language specific but is a feature of other components of human cognition instead. Recursion is seen to be hierarchically ordered, and other non-linguistic actions involve the sequencing and combination of small behavioral units into greater wholes. While recursion may be important to language, it may not be specific to humans or their languages.

Conclusion

Chomsky (2015) argues in favor of the language acquisition device being appropriate in terms of explanatory adequacy, meaning it acts as a linguistic theory that can explain the intuition a child

has to learn a language. He also notes that the LAD is only one part of the total system of intellectual structures that can be utilized in problem-solving and conceptual formation.

Theorization, argumentation, and evidence in favor and against the language acquisition device respectively support and dismiss various aspects of the LAD, as well as its very existence. Findings from potential future research conducted can help further examine the language acquisition device and all of its components.

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