

Early Grammatical Development: Nature or Nurture?

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Abstract:

As many people have become concerned about early language acquisition and hold their own different perspectives, the emphasis has been put on this aspect and abundant research studies have been implemented. Both parties held firm to their own views, one believes that can be attributed into input-driven tradition which relies more heavily on our environment as opposed to the other group supports Chomsky's universal grammar, that considered as early language acquisition aptitude is the nature and innateness of individuals that infants are born with. In this review, we are going to show our views and reveal the weakness of mechanism of universal grammar (UG) and its nature. We show the arguments for and against UG and some ideas about input-driven theory at the same time, to demonstrate our critical analysis to nature and nurture. In my view, I reckon that environment has a universal impact between UG And input-driven, referring to the outcome of previous studies, children might use universal grammar more in their early stage and are affected more by the input-driven in the subsequent learning phase, but both of them cannot be separated from the environment. This research clearly explains how children acquire a language in the early stage, which promotes the development of language pedagogy.

Keywords: early grammatical development; universal grammar; nature; nurture; statistical learning.

1. Introduction

For many, early language acquisition is considered as a process that learned through sensory stimulus and daily practices and experience. Infants manage to learn a significant number of words and grammatical rules and most of them are able to comprehend and utilize complex human languages within 5 or 6 years [1]. The former one will be elaborated further later in our paper, and the latter one tested experimentally whether there are some so-called linguistic universals in recent generative grammar theories (e.g. Chomsky, 1981) [2] that play a significant role in child language development, and found that children can acquire the language as soon as they master the grammatical structure, not only that, he also provided lots of insights with regards to the nature of early grammatical development.

As everyone knows, statements about children's early language acquisition are divided into two directions, one is input-driven tradition that relies more heavily on the environment while the other is knowledge-driven tradition which is typically called universal grammar. Universal grammar (UG), that is the theoretical or hypothetical system of categories, operations, and principles shared by all human languages and considered to be innate. It is associated with work in generative grammar, and it is based on

the idea that some certain aspects of syntactic structure are universal. However, input-driven emphasizes something gained and absorbed from the world around us after we are born.

What nature and nurture differ is that they play different roles in learning mechanism, the former term can be summarized as the continuous output from the existing language system contain, while the latter term is the intake from the environment that we are living and learn from this world.

Undeniably, we are easy to find their common ground is that they both take advantages of environment and experience. Input-driven helps people to gain grammar and acquire a language from the environment. But is nature completely unaffected by the environment? Children who are exposed to certain environmental influences and infections while in the womb in that infants have already heard diverse sounds from the outside before they are born. Does it influence their brain development of language mechanism in their early stage? And I think that might also be one of the reasons contributing to the inaccuracy of methodology used in the experiments.

In this review, two points will be combined as two parallel ways to explain a new perspective on language acquisition, and the role of the environment on the usage of UG and input-driven theory on language acquisition will also

be explained. Two theories will be illustrated with their weaknesses and strengths first, and illustrate the interaction function of nature and nurture on language acquisition.

After briefly describing my perspective, now I will show you my literature review's content. Firstly, I confirm the theories of UG and input-driven account that relies more heavily on the environment. Next, I point out some merits and weaknesses of both of them and suspect its accuracy of methodology used in the experiment and analysis in a proper way, in order to better support and expound my opinion. Then, I show my view that advocate for statistical learning and present my critical thinking at the same time. In the end, I sum them up and emphasize it again with some pedagogical implications, though it exists some limitations and weakness such as less access to get information and lower accuracy to the methodology.

2. Discussion about universal grammar

2.1 Arguments for universal grammar

Leading the pack is Chomsky, who believes that language is innate and grammar is generated, children are born with a universal grammar (UG) [3], that means humans have innate faculties for language acquisition. From their perspective, universal grammar, grounded in generative grammar [4], refers to the idea that people often acquire through biological evolution and inheritance. Regardless of the language one speaks or the location on Earth, as long as one is human, there is a unique and blanket grammar in one's mind that all the human languages can be abstracted into, which is fair for everyone to acquire language as a foundation. Since linguistic principles are part of the collective unconscious, children from different ethnic groups and races are born with a common grammar. Due to different acquired language environment, that is different external stimuli, individuals obtain different native language generative grammar within the universal grammar. In fact, universal grammar is a hypothesis proposed by Chomsky to reveal the secret of human language acquisition mechanism. It assumes that all human languages follow a series of abstract principles and necessary conditions, which constitutes the basic system of various concrete languages. This grammar is not a social rule, but a mental rule in the human brain. Many scholars like Charles Yang argue that early language acquisition depends more on infants' nature and grammatical learning aptitude [5] since the initial state of language development is determined by individual genetic endowment and is considered to boost linguistic abilities by perceiving part of the environment as linguistic experience. Besides, Md Enamul Hoque (2020) acknowledged the significance of

UG theory played a great role in children's early grammatical development and considered as a fundamental and crucial turn or shift from behaviorist opinions, as children are encouraged to revise their parameter setting and know more clearly about how a child learns a language [6].

Also, Christian Hejlesen Christensen (2019) believed that unbounded productivity and creativity inherent in the language acquisition process cannot be solely attributed to sensory input, as it is implausible for a child to accumulate sufficient linguistic data through sensory means to achieve the level of linguistic proficiency observed. The second argument builds upon the first, emphasizing the innate grammatical structures posited by the theory of UG [7]. In a word, despite children receive inadequate linguistic input to fully "learn" complex grammatical structures, they exhibit near-perfect accuracy in this domain.

However, although many scholars have demonstrated the existence of UG, Chomsky does not deny the role of acquired environment when he emphasizes that language acquisition is inseparable from the innate universal grammar or the Language Acquisition Devise (LAD) [8,9]. The input of the acquired language environment, that is the language experience acquired by the language learner, is crucial. If a child is born away from human beings and has no access to human language, he cannot acquire any language even if he possesses the ability to acquire language knowledge. In a word, the process of language acquisition is a process of using the existing general grammar knowledge and setting parameters through the stimulus of the acquired environment. For instance, Charles Yang and other scholars [5] believed infants use the parts of environment as linguistic experience which regulates the growth of language faculty. Therefore, many researches does not disavow that UG can be influenced by the environment.

2.2 Arguments against universal grammar

After that, a bunch of academics poured into this field and launched an attack on UG. In 2015, Lidz and Gagliardi (2015) believed children relies more on their surrounding rather than innateness, they think children can find some rules and regularities in this way and then learn something, including grammar by summing up the experience and learning from the environment [10]. In their view, they believed that UG merely defines a potential representational space, licensing a rich set conclusions about sentences that are highly dissimilar from those experience, but this only sets the initial conditions for learning, hence, people feel that there is still a need to possess and define a mechanism for environmental input. In addition, the mismatches between input and intake is also a reason for UG theory to be questioned in their review.

Francis Y. Lin (2017) also pointed out several flaws in Chomsky's methods. Firstly, the author criticized Chomsky's methodology for being seriously flawed in its inability to lead to the discovery of innate universality (UG) in any language [11]. Specifically, he mentioned that Chomsky's approach relies on an argument called the 'best theory', which deduces the innate structure of language by drawing analogies to other areas of the natural sciences, such as the visual system, thermonuclear theory and evolutionary developmental biology. However, he argued that this analogical reasoning is problematic because it overlooks fundamental differences between linguistic phenomena and other natural phenomena.

Additionally, Md Enamul Hoque (2021) discovered something wrong or has negative influences on adult language learners to acquire a second language after some experiments and surveys, he specifically examines the three hypotheses concerning universal grammar (UG) in second language acquisition (SLA) and investigates whether human language learners can utilize the principles and parameters of UG to construct the grammar of a second language [6]. In the following years, some language typologists like Nicholas Evans and Stephen C. Levinson (2022) (E & L) tend to explain the language through the external factors and put emphasis on culture evolution and cognition of language. They disagree UG mainly because cultural backgrounds of each country are different and do not believe that the linguistic mechanisms and universal rules proposed by UG are applicable to everyone. Therefore, when considering specific culture and social backgrounds, there may be some subtle changes, so that it is not possible to truly acquire a second language.

3. Input-driven tradition

3.1 Idea of input-driven theory

As early as 1970, Stephen D. Krashen (1970) proposed the input hypothesis, that is a central part of theory of language acquisition and this hypothesis emphasizes that language acquisition requires comprehensible input. Specifically, the input hypothesis states that learners need to be exposed to understandable input material that is slightly above their current language level in order to acquire language more effectively.

By distinguishing between input and intake, researchers gain insight into why learners' sensitivities do not align precisely with observer-neutral measures of informativeness and language acquisition devise (LAD) [8,9] are divided into three parts: intake mechanism, UG and inference mechanism. As far as I am concerned, I attach great importance to the role and significance of inference mechanism in child language learning development at the same

time. And I reckon that early language acquisition mainly developed by children accumulate some vocabularies and grammar in the context through acquired learning, which is very similar to statistical learning. In my understanding, statistical learning is a method for children to learn to speak a language by analyzing external language input. For example, a child observe the sound and the surrounding that near by in the daily life, such as a tree and find they can always match with each other together, and after finding this regularity and experiencing many times, child will gradually get awareness of this sentence can be matched with that thing.

Saffran (2009) also argued that statistical learning is not only a single calculation of a group of primitives, but the tracing of multi-level rules by learners in complex inputs, including infants. As a result, they are able to make use of these regularities and naturally give verbal inputs and outputs, which stands for the input-driven tradition [12].

3.2 The role of environment in the input-driven theory

By incorporating the structure of the learning environment into the learning account, Michael Harrington and Simon Dennis distinguished the input-driven approach from the alternative account, in which the learner's internal language and cognitive process are the main focus of language learning [13]. The input-driven approach made a minimum assumption on the role of innate ability in explaining language, which means innate ability provides a foundation for language learning while the language environment is a particularly crucial variable in language acquisition. In addition to, Jeffrey Lidz and Annie Gagliardi argued that the essence of learning is a pattern of memorization in which learners accumulate and store something that they learned from the environment, after a period of time, children can understand and master some sentences that are beyond their initial competence [10]. Consequently, it is easily to find that the acquisition of language is inseparable from the environment, no matter in universal grammar, or in input-driven approach.

4. Discussion

From my perspective, I think the environment plays an essential role in both UG theory and input-driven theory, since Chomsky does not ignore role of acquired environment and nurture is mainly based on its language environment. In my view, infants can hear something from outside when they still in their mother's womb and influenced by the outside world, as a result, they have a slight impression of language even before they are born, which means they have already been affected by what the environment done to them [14]. Thus, the function of en-

vironment in language acquisition cannot be overlooked. Last point need to be mentioned is, in the input-driven tradition, the essence of learning is a form of memory, and people may neglect that children are born with the innate learning ability, rather than being naturally proficient in language or grammar. In my opinion, children can develop and cultivate their ability to learn linguistic knowledge through the environment provided by their parents, which includes different educational resources and educational concepts. This helps children discover patterns gradually, summarize independently and construct their unique linguistic systems, that is why parents with different educational ideas and from different families raise children with diverse abilities. Many children are not born speechless, it has been reported that some of them lose their language skill and speaking ability due to an overly oppressive home atmosphere, which can also lead to autism in some children [15]. In short, infants are born with the capacity to obtain knowledge, but not the ability to use language and grammar. These skills require continuous learning, vocabulary accumulation, grammar mastery, pattern discovery, method summarization and practical exercises. Therefore, environmental input plays a more significant role in children's early grammatical development. Hence, this is another reason to support statistical learning and comprehend input-driven account more clearly.

Other than that, there is no direct proportion between intake and input, thus, there is no compelling reason to attribute early language development solely to either innate abilities or environmental factors. Furthermore, due to the varying social backgrounds and cultural contexts in which individuals find themselves, it is impossible to definitely determine whether language and grammar are innate.

5. Conclusion

In conclusion, in my review, firstly introduce the social background of grammatical development in early stage and explain its current condition, following by listing loads of papers proposed evidence to advocate and contradict UG, in particular statistical learning proposed by Lidz and Gagliardi (2015) [10], which really persuaded me and left me a deep impression and believe that environment plays an important role in both universal grammar and input-driven theory. Next, we discuss about UG and input-driven account relies heavily on the environment and analyze each merits and drawbacks to introduce our view. Moving on to the implications of doing this research, the reason is to reveal the secret and nature of children's grammatical development in that how infants can develop their language and grammar in such a short time, and raise the awareness of input-driven learning that based on

the pedagogical environment. It is recognized that different social environments and educational concepts have different effects on children's language stimulation and acquisition, whether it is UG or input-driven, the role of environment is not neglectable.

6. Limitations

In the long history of scientific research, research methods continue to evolve and innovate. However, with the development and deepening of the early language acquisition, people gradually realize that the existing research method is not perfect. Many methods may not work in a particular context, and the assumptions behind them may be biased. First of all, the applicability of research methods is limited. Different research problems require specific approaches to solve in that some methods may not work in the natural sciences. As Einstein said, "It is often more important to present a problem than to solve it, because solving a problem may only be a mathematical or experimental skill." Second, the assumptions in research methodology are not always completely valid, some of them are based on specific preconditions, but these conditions may not be fully satisfied in actual research. Taking Chomsky's UG experiment in linguistics as an example, its hypothesis might be too idealistic. Furthermore, ethical considerations pose important limitations to research methods, just as inhumane experiments cannot be carried out on children as young as a few months old, such as putting a child in a dark room and cutting off contact with the outside world, which is infeasible and impracticable and also out of respect for human dignity and rights.

To sum it up, when selecting and applying research methods, researchers should fully consider their applicability, validity and ethical constraints. Only in this way can the research be more scientific and plausible, and make more valuable contributions to promoting the progress of knowledge in early grammatical development.

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