

Criticism of the Poverty of the Stimulus Argument (POSA)

Pouya Vakili

ABSTRACT

This paper intends to provide information about the Poverty of the Stimulus Argument (POSA) by presenting different viewpoints. At the outset a brief history of Nativism was provided, and then linguistic nativism and empiricism were elaborated on. Afterward, Plato's ideas will be argued for and against and then Plato's problem will be discussed in detail. For this purpose, his ideas will be compared and contrasted with Chomsky's perspective of innateness. Chomsky's Universal Grammar will be discussed in the scope of POSA, and its properties will be explained in detail. In addition, Chomsky's viewpoints will be compared with Skinner's and Tomasello's to find out their perspectives on language learning processes. Finally, Universal Grammar will be discussed from the perspective of Usage-Based linguistics in order to highlight the shortcomings of Universal Grammar and address the questions that this theory is unable to resolve.

Keywords: empiricism, nativism, poverty of stimulus argument, universal grammar.

Published Online: April 4, 2023

ISSN: 2796-0064

DOI: 10.24018/ejlang.2023.2.2.84

P. Vakili*

Illinois State University, Normal-
Bloomington, IL., USA

(e-mail: pvakili@ilstu.edu)

**Corresponding Author*

I. INTRODUCTION

The innate structure of the mind has been an ongoing debate among philosophers throughout history due to its complexity and unpredictability. Plato has been named the pioneer in developing arguments in this field of research. He primarily argued that human beings are born with some kind of knowledge and abilities, and we don't have much knowledge/experience about and access to what children are born with. In other words, he believes that "learning by experience" is, in fact, "recollecting" what we already know so that certain kinds of knowledge are "innate" knowledge.

Plato's claim had been examined throughout history by different schools of philosophy including the ones in the Age of Enlightenment (like Locke, Montesquieu, and Jean-Jacques Rousseau to name a few). Building up on Plato's claim, these philosophers initially questioned the meaning of "innate" in order to later address what specific things may be innate and what the reason for their innateness can be. Arguably, Locke (1847) questioned the presence of any innate principles in the mind because the notion of innateness is of no sense. Locke, at the outset of his argument, questioned the true meaning of innateness from Plato's perspective.

Plato defined innateness as the things in mind at birth, however, Locke proposed that if this meaning is taken, then people should continue using the same innate principles from birth later in life, however, it is evident that many of these innate principles have no role in the people's mental development in life. Locke questioned the alternative to innateness theory (nativism) in that he stated that there is no evidence that innateness exists rather there is some evidence that it is a false claim. Additionally, he questioned the emergence timeline of these innate principles supposing that people have the potential or dispositional attribution of certain innate principles at birth. Therefore, he proposed to establish some criteria to classify and characterize innate and non-innate principles. However, Locke (1847) continued that finding such criteria would be impossible, therefore, the notion of innateness must be rejected, and the nativism approach must be overlooked.

II. AN OVERVIEW OF LINGUISTIC NATIVISM

Linguistic nativism holds the idea that children are born with some innate knowledge of their own language. this section intends to initially review the theories of language acquisition and then dive into linguistic nativism. In general, nativism claims that anyone acquiring their first language possesses an internal grammar of that language. In fact, they state that people are born with some general characteristics (principles) of their first language, and it is an environmental factor that can help diminish or development of the grammar of the language that they are born with. Undoubtedly, the grammar that a competent speaker

possesses is not innately specified since that grammar knowledge heavily depends on the environment in which the individual lives and the people the individual interacts with. For instance, it is impossible to distinguish a child's grammar born to English-speaking parents from a child who is born to French parents. These two children have some common knowledge (principles) of the language of their parents, but where they grow up and who they interact with will influence the development of that innate grammar.

Nevertheless, all humans in the world acquire language competence within their first years of life, and this language competence depends on their environment. In other words, if humans are supposed to live in isolation, no language development/acquisition will occur. This idea suggests that humans are born with some innate resources of language, and they have the capacity and capability to acquire the grammar of the language they speak. However, the pivotal debate rises at this stage which questions the characteristics of the initial state of language acquisition (Samuels, 2002; Vakili & Mohammed, 2021; Vakili, 2022). In fact, the main question can be the qualities and reliabilities of these innate resources.

III. LINGUISTIC EMPIRICISM VS. LINGUISTIC NATIVISM

Empiricists believe that the language acquisition mechanism is a cognitive development of human beings (Croft, 2007). In other words, they do not deny the innateness of language, but they state that the same cognitive mechanism that human needs to develop other skills is also responsible for language acquisition as well. On the contrary, nativists claim the presence of the language domain is an innate source in which language acquisition happens. Moreover, even within these two broad theories, many more different viewpoints are presented. For example, looking into linguistic nativism, several diverse claims can be traced in a way that these claims, under the umbrella of one theory, may have some disagreements over one position in that theory. One of these controversies deals with the specific nature and scope of innate language-specific resources. For example, Chomsky, one of the main figures supporting nativism, and his followers believe that all human beings are born with an innate language faculty that is called Universal Grammar which consists of a set of atomic grammatical categories and relations that are the building blocks of the particular grammars of all human languages (O'Grady, 2008, p.427). However, some other nativists disagree with the idea of Universal grammar while they still insist on the presence of an innate language-specific learning mechanism. This disagreement led Chomsky to propose a "minimalist program" approach in which the nativists de-supporting UG will fall into that group (Fitch *et al.*, 2005).

IV. PLATO'S PROBLEM

Plato's problem is associated with some fundamental questions regarding human beings' knowledge. The main questions are in regard to how humans know what they know and how this knowledge is related to our experience. It was Chomsky (1984) who coined the term "Plato's problem" for the first time when he was examining children's ability to use language. While observing children, Chomsky noticed that most children are able to construct complex sentences by the age of four. This ability, in fact, happens before children have any academic schooling or mathematical skills. Therefore, he raised this question "How is it that children can use language so early in life?" This question has become known as Plato's problem.

Historically speaking, Plato is known for his works on knowledge, experience, and the interrelationship between these two. On the same line, language-related questions such as how it is learned, and what role experience plays in obtaining such knowledge are directly associated with the questions that Plato proposed (Scott, 2006).

In general, while this term has also been used in different disciplines other than linguistics such as psychology and epistemology, it directly addresses the main question in linguistics which is how we acquire language. In fact, this question is in regard to what knowledge and experience human beings have or need to have in order to acquire language. However, before answering such questions, it intends to define the terms "knowledge" and "experience" and then associate them with language acquisition.

V. AN OVERVIEW: POVERTY OF THE STIMULUS ARGUMENTS

POS argument is founded on the assumption that environmental factors are not enough to lead to language knowledge rather some innate abilities/capabilities are required for language acquisition. Pullum and Scholz (2002) have identified four parts for any POS argument namely the acquirendum, the indispensability piece, the inaccessibility piece, and the acquisition piece. In their discussion, they argue that the acquirendum is responsible for identifying a specific piece of syntactic knowledge. In the next stage, the indispensability piece evaluates the necessary input required to fill the acquirendum. After that, the inaccessibility piece recognizes the lack of indispensable pieces in the learner's mind. Finally, the acquisition piece indicates the presence of syntactic knowledge at the earliest possible age (Pullum &

Scholz, 2022). In general, these pieces endorse the idea that syntactic knowledge is learned without any interference and support from the environment rather this knowledge has been inherently predisposed in humans' minds.

The main building block of POS lies in the assumption that the environment does not possess enough information to lead a child language learner to reach adult language competence. Pullum and Scholz (2002) have doubted this assumption since they believe that this theory is based on primary linguistic input. To strengthen this assumption, nativists decided to eliminate the role of distributional information in language acquisition. However, some recent studies show the importance of distributional information to learning word segmentation and syntactic analysis (Christiansen *et al.*, 1998; Lewis & Elman, 2001). Additionally, other studies show that infants select distributional signals with a high level of accuracy due to their sensitivity to the statistical structure of information (Saffran *et al.*, 1996). In general, these aforementioned studies and much more support the essential role of distributional analysis in the acquisition of syntactic structure.

Vakili (2022) claims that the POS argument is basically founded on the assumption of insufficient information of syntactic/linguistic input at early ages. One way to demonstrate this absence of input is to refer to the studies which examined learners' abilities to decide between grammatical and ungrammatical structures. For example, regarding auxiliary fronting in polar interrogatives, a corpus analysis approach was used to estimate the distributional information in the primary linguistic input leading to select grammatical and ungrammatical structures. The results show enough statistical information in the corpus in that the grammatical and ungrammatical forms of auxiliary questions were selected with a high level of accuracy (Kirby & Christiansen, 2003). In general, this study and similar studies show little evidence that a child is equipped with all knowledge of the language.

A. *The Poverty of the Stimulus Argument*

Nativists/empiricists share a common idea on the Poverty of Stimulus arguments. Although these arguments are not universally agreed upon or no standardized propositions are addressed (Cowie, 1999; Laurence & Margolis, 2001), these arguments share a common idea which is the knowledge that learners acquire to reinforce certain cognitive abilities is drastically beyond the input available to the learners in their environment (Cowie, 1999). In other words, POS arguments find the information available to learners too little to enable them to perform/acquire certain cognitive abilities. Therefore, nativists believe that the required knowledge must originate from somewhere else rather than the mere environment. On the contrary, empiricists value environmental factors more and they believe that nativists overlook the amount of information available in the environment, so empiricists find children better learners than what nativists assume.

B. *Statistical Properties of Natural Languages*

Although innate constraints are believed to affect how cognitive information processing happens in the brain, Kirby and Christensen (2003) claim that these constraints can affect all cognitive behaviors and they are not limited only to language such as affecting working memory which is a part of the learning component. While statistics emphasize the role of experience and environment in language acquisition, generativists look at children as very poor learners. However, learnability is defined in terms of sufficient statistical information to produce correct grammatical structure and children's capability to learn from that information (Vakili & Mohammed, 2022). Some studies by Lewis and Elman (2001) and Elman (1990) show that implicit statistical forms present in the primary linguistic input may result in preferred grammatical structure.

C. *Chomsky's Universal Grammar and the Poverty of Stimulus argument*

Universal Grammar is founded on the assumption known as the logical problem of language acquisition (Chomsky, 1965, 1988; Cook, 1985, 1988; Ellis, 1994). This assumption looks at children's ability to obtain grammatical competence and the available input in the environment. The combination of the logical problems of language acquisition and the POS argument is the basis of Chomsky's debate supporting the presence of an innate and domain-specific mental mechanism that facilitates children in their language acquisition process (Cook, 1985). In the same vein, Chomsky (1965) states "It seems plain that language acquisition is based on the child's discovery of what from a formal point of view is a deep and abstract theory—a generative grammar of his language—many of the concepts and principles of which are only remotely related to experience by long and intricate chains of unconscious quasi-inferential steps.

A consideration of the character of the grammar that is acquired, the degenerate quality and narrowly limited extent of the available data, the striking uniformity of the resulting grammars, and their independence of intelligence, motivation, and emotional state, over wide ranges of variation, leave little hope that much of the structure of the language can be learned by an organism initially uninformed as to its general character" (p.56). In other words, Chomsky finds environment and experience insufficient sources of information and input to help children in their language acquisition process. In fact, he believes that the

available input in the environment or through experience is too limited to help children decide on grammatical and ungrammatical structures in such a short time.

D. Chomsky and Skinner; an Opposition

Chomsky's (1959) review of Skinner's perspective on language learning addressed the abstractness of language which can't be accomplished through associative patterns presented by Skinner. Introducing the Poverty of Stimulus argument, Chomsky highlighted the complexity of language which can't be acquired from some little input or exposure to some stimulus. He maintained that behaviorism (attributed to Skinner that relies on imitation) can't explain children's production of unheard structures nor justify the errors children make when these errors have never been produced in their adult caregivers' language.

Additionally, Chomsky claimed that any language is rule-governed so that children might not make certain errors that they are expected to. Furthermore, developing the POS argument, Chomsky claimed the existence of a biologically predetermined ability to acquire language which later became known as Universal Grammar. In general, Chomsky was the first cognitive theoretician who looked at the psychological representations of language and combined the language acquisition process with cognition.

E. Tomasello Against Chomsky

Tomasello (1995) finds a number of problems with Chomsky's Universal Grammar. One of his significant criticism lies in the hypothesis of the POS argument. Tomasello (1995) believes that this hypothesis is mainly based on logical reasoning, and it doesn't do anything with empirical research and study. Additionally, Tomasello (ibid) mentions that the POS argument doesn't take the amount of input and information to which children are exposed into account because this exposure limits the kinds of mistakes that children might "logically" make. This argument has been supported by Vakili and Mohammed's (2020) study in which they showed that students connect learning a first and/or second language to learning vocabulary, and syntax which might happen in a series of trial and error.

For example, regarding Chomsky's belief, children are expected to have difficulty in forming question sentences following inductive learning strategies suggested by behaviorists. The example below shows how this inductive form works (the examples are adopted from Tomasello (1995).

- (1) a. The man is bold.
- b. Is the man bold?
- (2) Rule for question formation

When children are exposed to sentences (1) a & b, they might inductively come up with the rule to form question sentences such as moving the verb to the front of the declarative sentence.

Additionally, when children are given a sentence like (2), and they have the inductive assumption stated earlier, they are expected to produce sentences like (2. a) by moving the verb to the front of the sentence.

- (2) [The man who is running] is bald.
- (2) a. *Is the man who _____ running is bald?
- b. Is the man who is running _____ bald?

However, as Chomsky states children do not make such mistakes although there is no evidence that sentences like (2. a) are ill-formed and no evidence of dialect varieties of motherese or caregiver speeches has been presented. Chomsky believes that children will produce sentences like (2. b) because they are based on their unconscious knowledge of the language.

Considering these examples, Chomsky concludes that children's innate knowledge helps them produce well-formed sentences such as (2. b) and doesn't allow them to make errors like (2. a). However, Tomasello (1995) and Vakili (2019) believe that such right decision-making happens due to the means of pattern-finding skills. In other words, he means that children are exposed to similar patterns, and they make their decisions to follow that pattern to produce well-formed structures. In addition, as Mohammed and Vakili (2021) state "students come to the classroom with some prior knowledge which may sometimes facilitate their learning and at other times may hinder their development of new knowledge" (p.10).

In addition, Tomasello (1995) looks at learning as a process that requires children's learning skills and abilities, and recent studies show that children walk far beyond inductive learning strategies that had been proposed by behaviorists, and Chomsky (1959) called these strategies inadequate and insufficient for language learning tasks. Alternatively, Tomasello (1995) believes that language learning is based on cognitive development which includes categorization and pattern-finding skills. These skills emerge and develop at least at seven months of age, and they continually develop more throughout children's life. These skills later result in the development of socio-cognitive skills that appear before the first birthday of the infant.

As can be seen, Tomasello's theory can be a more reliable alternative to nativism. This alternative

stresses that “unlike nativists who argue that children are innately equipped with some universal linguistic representations, usage-based theorists believe that linguistic structures emerge as language is used” (Vakili, 2022, p. 48). In other words, the more children are exposed to a language, the more they develop the necessary cognitive skills to acquire that language.

VI. CONCLUSION

This paper provides a comparison between nativism and empiricism. For this purpose, these theoretical frameworks have been elaborated on from different perspectives. As seen in the paper, Chomsky's Universal grammar has been rejected due to many different reasons. This argument is still controversial and has its own supporters. This paper doesn't intend to judge whether Universal Grammar provides the best explanation for language acquisition, but it shows that there are still unanswered questions from the UG perspective. Most scholars (Croft 2007; O'Grady, 2008, 2010; Traugott & Trousdale, 2013 to name a few) agree with human's capabilities to acquire language however, they are leaning more toward empiricism since they don't see UG as defensible anymore.

REFERENCES

- Chomsky, N. (1959). Review of B. F. Skinner's verbal behavior. *Language*, 35, 26–58.
- Chomsky, N. (1984). *Modular Approaches to the Study of the Mind* (Vol. 1). San Diego State Univ. Press.
- Christiansen, M.H., Allen, J. and Seidenberg, M.S. (1998). Learning to segment speech using multiple cues: A connectionist model. *Language and Cognitive Processes*, 13, 221–268.
- Cook, V. J. (1985). Chomsky's universal grammar and second language learning. *Applied Linguistics* 6(1), 2–18.
- Cowie, F. (1999). *What's within? Nativism reconsidered*. Oxford University Press on Demand.
- Croft, W. (2007). Construction grammar. In *The Oxford handbook of cognitive linguistics*. Oxford: Oxford University Press
- Ellis, R. (1994). *The study of second language acquisition*. Oxford: Oxford University
- Elman, J.L. (1990). Finding structure in time. *Cognitive Science*, 14, 179–211.
- Fitch, W., Hauser, M., and Chomsky, N. (2005). The evolution of the language faculty. *Cognition*, 97, 179–210.
- Kirby, S., and Christiansen, M.H. (2003). From language learning to language evolution. In *Language Evolution* (Christiansen, M.H. and Kirby, S., eds). Oxford University Press.
- Laurence, S., & Margolis, E. (2001). The poverty of the stimulus argument. *British Journal of Philosophical Science*, 52, 217–276.
- Lewis, J.D., and Elman, J.L. (2001). Learnability and the statistical structure of language: Poverty of stimulus arguments revisited. In *Proceedings of the 26th Annual Boston University Conference on Language Development* (pp. 359-370). Somerville, MA: Cascadia Press.
- Locke, J. (1847). *An essay concerning human understanding*. Kay & Troutman.
- Mohammed, R., & Vakili, P. (2021). Using ideologically loaded concepts as a tool for reversing folk notions of linguistic & cultural diversity. *Journal for Research Scholars and Professionals of English Language Teaching*, 5 (25).
- O'Grady, W. (2008). Keynote article: The emergentist program. *Lingua*, 118, 447–464
- O'Grady, W. (2010). “An emergentist approach to syntax,” in *The Oxford Handbook of Linguistic Analysis*, eds H. Narrog and B. Heine (Oxford: Oxford University Press), 257–283.
- Pullum, G.K. and Scholz, B. (2002). Empirical assessment of stimulus poverty arguments. *Linguistic Review*, 19, 9–50.
- Saffran, J., Aslin, R. and Newport E. (1996). Statistical learning by 8-month-old infants. *Science*, 274, 1926–1928.
- Samuels, R. (2002). Nativism in cognitive science. *Mind and Language*, 17(3), 233–65.
- Scott, D. (2006). *Plato's Meno*. Cambridge University Press.
- Tomasello, M. (1995). Language is not an instinct. *Cognitive Development*, 10, 131–56.
- Traugott, E. C., & Trousdale, G. (2013). *Contractualization and constructional changes* (Vol. 6). Oxford University Press.
- Vakili, P. (2019). How to learn a new language on your own. *Grassroots Writing Research Journal*, 9 (2).
- Vakili, P., & Mohammed, R. (2020). Grammar scares me: an exploration of American students' perceptions of grammar learning. *International Journal of Linguistics, Literature, and Translation*, 3(12), 124–135.
- Vakili, P., & Mohammed, R. (2022). A Cross-disciplinary corpus-based analysis of the frequency and syntactic positions of adverbials. *European Journal of Language and Culture Studies*, 1(6), 31–40. <https://doi.org/10.24018/ejlang.2022.1.6.43>.
- Vakili, P., (2022). Give me the rules, I'll understand grammar better: exploring the effectiveness of usage-based grammar approach through explicit instruction of adverbials. [Theses and Dissertations]. 1626. <https://ir.library.illinoisstate.edu/etd/1626>.
- Vakili, P., and Mohammed R. (2021). Invitation Accepted: International students as a pedagogical source to increase American Students' WE awareness. *Journal of applied languages and linguistics*, 5(3).