Volume 19 Issue 60
Originally issued as G10



Global Journal of human-social science: G
Linguistics & Education
Volume 19 Issue 10 Version 1.0 Year 2019
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals
Online ISSN: 2249-460X & Print ISSN: 0975-587X

Behaviorism, Innatism, Cognitivism: Considering the Dominance to Provide Theoretical Underpinning of Language Acquisition Conjecture

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Abstract- The language specialists have discerned that language is a species-specific and a biologically determined scheme for the human beings. After a child is born, it goes under pre-linguistic and linguistic stages of language acquisition. Although there are many different approaches to learning, three basic kinds of learning theory are prominent, like Behaviourism, Innatism, and Cognitivism. All these theories centered around 'nature' and 'nurture' theories or on 'empiricism' and 'nativism' concepts. According to empirical research usually knowledge comes through experience from the environment. Nativism holds that at least some knowledge is not acquired from the environment but is genetically transmitted and innate. The theoreticians never agree or disagree with any of these theories, whether environmentalist or nativist. The principle focus of this study is to investigate the dominance among three main doctrines by delving into the fundamental differences among them. The specification of these theories is also given prominence in this article. Finally, in the findings session, it has been tried to trace the dominance of one particular theory, among others.

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GJHSS-G Classification: *FOR Code: 200399*



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I. Introduction

Language acquisition is the process by which humans acquire the capacity to perceive and comprehend language, as well as to produce and use words and sentences to communicate. The history of language learning theories is a great pendulum cycled from Skinnerian environmentalism to Piagetian constructivism to Chomskian innatism. Linguists Noam Chomsky and Eric Lenneberg, for half a century, have argued for the hypothesis that children have inborn capabilities that make the language learning possible. Evidence suggests that every individual has three recursive mechanisms that allow sentences to go indeterminately, like relativization, complementation, and coordination (Matilal, Bimal Krishna, 1990). Furthermore, there are actually two main guiding principles in the first-language acquisition, that is, speech perception always precedes speech production and the gradually evolving system by which a child learns a language is built up one step at a time, beginning with the distinction between individual phonemes (Fry, Dennis 1977).

In this study, it has been tried to find out a particular benchmark for fixing up the most acceptable answer for language acquisition procedures. In the field of language acquisition Behaviorism, Innatism, and Cognitivism theories are granted as the three most prominent schools of thought in providing a theoretical paradigm of language acquisition trail. Some critics are with the behavioral approach of language acquisition, some are with the innate or by the born capacity of a human child to achieve its first language, and some others are with the ability of cognition and perceptions. First of all, these three theories will be discussed as per their traits with criticisms in the discussion session. Some past works and findings will be focused on the literature review part to establish the authenticity of this study. And then, in the findings section, the dominant theory will be highlighted in relation to the other language acquisition theories.

II. Literature Review

From some ancient observations we perceive that mapping of word meaning is innate. Additionally, Sanskrit grammarians debated for over twelve centuries whether humans' ability to recognize the meaning of words was god-given or passed down by previous generations and learned from already established conventions (Fry, Dennis 1977). In a more modern context, empiricists, like Thomas Hobbes and John Locke, argued that knowledge (and, for Locke, language) emerge ultimately from abstracted sense impressions. These arguments mainly supported that language is acquired through sensory experience (Kendra A. Palmer, 2009). Dissatisfaction with behaviorism's strict focus on observable behavior led educational psychologists such as Jean Piaget and William Perry to demand an approach to learning theory that paid more attention to "inside the learner's head." They developed a cognitive access that focused on mental processes rather than observable behavior (Dr. Barman Binoy, 2006). According to cognitive

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psychologists, 'meaning' plays an significant role in human learning. 'Learning' is a meaningful process of "relating new events or items to already existing cognitive concepts." (Brown, H.D.1987).

All these above literature are focusing on different patterns and techniques of learning a first language after a baby born. Behaviourism is emphasizing performance and behavior in successful learning, whereas Innatism is supporting by-born and natural pre-conceptions of a child to gain the language better than any other process. On the other hand, Cognitivism is highlighting the importance of meaning, and understanding. They focus on cognitive development, cultural background, and personal history to gain new knowledge rather than depending on passively absorbed behavioral repertoire. Each theory is logical and reasonable in their standpoint. That is why; still bewilderment exists in the field of first language acquisition regarding the most acceptable hypothesis to meet up the controversy. In this study it has been tried to pick up a satisfactory presumption among those three above mentioned speculations based on relevant logical analysis.

III. Discussion

a) Behaviourism

According to Behaviorism, humans produce their behaviors in response to certain stimuli in the environment, including other factors like an individual's history reinforcement and punishment, an individual's current motivational state, and controlling stimuli. During the first half of the twentieth century, John B. Watson devised methodological behaviorism, which rejected introspective methods and sought to understand behavior by only measuring observable behaviors and events. It was not until the 1930s that B. F. Skinner suggested that private events—including thoughts and feelings—should be subjected to the same controlling variables as observable behavior, which became the basis for his philosophy called "radical behaviorism" (Chiesa, Mecca, 1994), (Dillenburger, 2009). While Watson and Ivan Pavlov investigated the stimulus-response procedures of classical conditioning, Skinner assessed the controlling nature of consequences and also its potential effect on the antecedents (or discriminative stimuli) that strengthens behavior; the technique became known as operant conditioning. Skinner's radical behaviorism has been highly successful experimentally, revealing new phenomena with new methods, but Skinner's dismissal of theory limited its development. Theoretical behaviorism recognized that an organism has a state as well as sensitivity to stimuli and the ability to emit responses (Staddon, John, 2014). Indeed, Skinner himself acknowledged the possibility of what he called "latent" reaction in humans, even though he neglected to extend this idea to rats and pigeons (Staddon, J, 2017). Latent responses constitute a repertoire, from which operant reinforcement can select.

i. *Varieties*

There is no universally agreed-upon classification, but some titles given to the various branches of behaviorism include:

(i) Methodological behaviorism: Watson's behaviorism states that one can only observe the public events (behaviors of an individual), and that therefore, one should ignore the private events (thoughts and feelings). (Skinner, BF, 1976) (Zalta, Edward N, 2006).

(ii) Radical behaviorism: B. F. Skinner's behaviorism theorizes that processes within the organism should be acknowledged, particularly the presence of private events (such as thoughts and feelings), and suggests that environmental variables also control these events just as they control observable behaviors. Willard Van Orman Quine used many of radical behaviorism's ideas in his study of knowledge and language (Skinner, BF, 1976).

(iii) Teleological behaviorism: Post-Skinnerian, purposive, close to microeconomics. It focuses on objective observation as opposed to cognitive processes.

(iv) Psychological behaviorism: As proposed by Arthur W. Staats, unlike the previous behaviorisms of Skinner, Hull, and Tolman, was based upon a program of individual research involving various types of human behavior. Psychological behaviorism introduces new principles of human learning.

(v) Inter behaviorism: Founded by Jacob Robert Kantor before Skinner's writings were formulated.

ii. *Operant conditioning*

Operant conditioning was developed by B.F. Skinner in 1937 and deals with the modification of "voluntary behavior" or operant behavior. Operant behavior operates on the environment and it follows its consequences. Reinforcement and punishment, the core tools of operant conditioning, are either positive (delivered following a response), or negative (withdrawn following a response) (Classical and Operant Conditioning - Behaviorist Theories, 2015). Skinner created the *Skinner Box* or operant conditioning chamber to test the effects of operant conditioning principles on rats. From this study, he discovered that the rats learned very effectively if one can reward them frequently. Skinner also found that he could shape the rats' behavior through the use of rewards, which could, in turn, be applied to human learning as well.

iii. *Classical conditioning*

Classical conditioning (or Pavlovian conditioning or respondent conditioning) is also an vital behavior-analytic process that need not refer to mental

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or other internal processes. Pavlov's experiments with dogs provide the most familiar example of the classical conditioning procedure. In simple conditioning, Pavlov presented a stimulus to the dog such as a light or a sound, and then food was placed in the dog's mouth. After a few repetitions of this sequence, the light or sound by itself caused the dog to salivate ("Ivan Pavlov." Retrieved 16 April 2012). The idea of classical conditioning helped behaviorist John Watson to discover the key mechanism behind how humans acquire the behaviors that they do to find a natural reflex that produces the response. Watson's "Behaviorist Manifesto" has three aspects that deserve special recognition: one is that psychology should be purely objective, with any interpretation of conscious, thus leading to psychology as the "science of behavior"; the second one is that the goals of psychology should be to predict and control behavior as opposed to describe and explain conscious mental states; the third one is that there is no notable distinction between human and non-human behavior. Following Darwin's theory of evolution, human behavior is just a more composite version with respect to the behavior displayed by other species. (Richard Gross, 2010)

IV. Innatism

Innatism proposed that the human mind is born with prior knowledge and it is not a blank sheet of paper. According to this theory, environment, and attitude is not enough for a human child to process language or any other kinds of information. Here the nature is monumental than the role of nurture. Plato and Descartes are prominent philosophers in the development of innatism, and the notion that the mind is already born with ideas, sense, and beliefs (Tad M. Schmaltz, 2002). Both philosophers emphasize that experiences are the key to unlocking this knowledge but not the source of the knowledge itself. Basically, no learning is derived exclusively from one's wisdom as empiricists like John Locke suggested (Stich, S. P., 1975). According to Noam Chomsky, the grammatical faculty was built into the infant brain, and a child is a “linguistic genius” mastering the course of complex language within four years. Children are hypothesized to have an innate knowledge of the basic grammatical structure common to all human languages. In general usage, the terms *innatism* and *nativism* are synonymous as they both refer to notions of pre-existing thoughts present in mind. Innatism refers to the philosophy of Plato and Descartes, who assumed that a God or a similar being or process placed innate ideas and principles in the human mind (Tad M. Schmaltz, 2002). Nativism represents an adaptation of this, grounded in the fields of genetics, cognitive psychology, and psycholinguistics.

a) Innatism in Learning

There are two ways in which animals can achieve information. The first of these two ways is learning when an animal gathers information about its surroundings and then proceeds to produce this information. For example, if an animal eats something that hurts its stomach, it has learned not to eat this again. The second way that an animal can acquire facts is through innate storage of facts. This knowledge is genetically inherited. The animal automatically knows it without any prior experience. An example of this is when a horse is born and can immediately walk. The horse has not learned this behavior rather achieves it automatically. (Dunlap Lehtila, 2013)

V. Cognitivism

Cognitivism became the dominant force in psychology in the late-20th century, replacing behaviorism as the most popular paradigm for understanding mental function. Cognitive psychology is not a wholesale denial of behaviorism, but rather an expansion. The main issues that interest cognitive psychologists are the inner mechanisms of human thought and the processes of knowing. Cognitive psychologists have attempted to shed some light on the alleged mental structures that stand in a causal relationship to our physical actions.

Cognitive theory tends to focus on conceptualizing the student's learning process: how intimation is received, how intelligence is processed and organized into existing schema, and how individual can retrieve information. Cognitive approaches mainly focus on the mental activities of the learner like planning, goal setting, and organizational strategies (Shell, 1980). In cognitive theories, not only the environmental factors and instructional components play an essential role in learning. There are additional elements like learning to code, transform, rehearse, and store and retrieve the facts. The learning process includes learner’s thoughts, beliefs, and attitude values. Memory plays a vital role in the learning process. Usually, information stays within a memory in an organized, meaningful manner. Here, teachers and designers play different roles in the learning process. Teachers supposedly facilitate learning and the organization of information in an optimal way. Forgetting is an inability to retrieve information from memory. Memory loss may be a mechanism used to discard situationally irrelevant intelligence by assessing the relevance of new details. According to cognitive theory, if a learner knows how to implement knowledge in different contexts and conditions then we can say that the learner learns to transfer the pre-existing idea. (Schunk, 1991) Understanding is composed of knowledge - in the form of rules, concepts and discrimination (Duffy and Jonassen, 1991). Memory use prior idea to identify

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similarities and differences between itself and novel information.

a) Some basic principles of Cognitive theory

There are some specific assumptions or principles that direct the instructional design: active involvement of the learner in the learning process, learner control, cognitive training (e.g., self-planning, monitoring, and revising techniques), the use of hierarchical analyses to identify and illustrate prerequisite relationships (cognitive task analysis procedure), facilitating optimal processing of structuring, organizing and sequencing information (use of cognitive strategies such as outlining, summaries, synthesizers, advance organizers etc.), encouraging the students to make connections with previously learned material, and creating learning environments (recall of prerequisite skills; use of relevant examples, analogies).

VI. Comparison among Behaviourism, Innatism and Cognitivism

a) Philosophical debate

Although individual human beings vary due to cultural, racial, linguistic, and era-specific influences, inborn ideas are said to belong to a more fundamental level of individual cognition. For example, the philosopher René Descartes theorized that knowledge of God is natural in everybody as a product of the faculty of faith. Other philosophers, most notably the empiricists, were critical of the theory and denied the existence of any innate ideas, saying all human knowledge depends on experience, rather than *a priori* reasoning.

Philosophically, the debate over innate ideas is central to the conflict between rationalist and empiricist epistemologies. While rationalists believe that some ideas exist before having any experience, empiricism claims that a baby gains knowledge from experience. Immanuel Kant was a German philosopher who is regarded as having ended the impasse in modern philosophy between rationalists, and empiricists and synthesized these two early modern traditions in his thought. Plato argues that if there are certain concepts that we know to be true but did not learn from experience, then it must be because we have an innate knowledge of it and this knowledge must have been gained before birth. The main antagonist to the concept of innate ideas is John Locke, a contemporary of Leibniz. Locke argued that the mind is, in fact, devoid of all knowledge or ideas at birth; it is a blank sheet or "*tabula rasa.*"

b) Differences between Behaviorism and Innatism

Skinner's behaviorist idea was stalwartly attacked by Noam Chomsky in a review article in 1959, calling it "largely mythology" and a "serious delusion"(Noam, Chomsky; Skinner, B. F., *1959).* Arguments against Skinner's idea of language acquisition through operant conditioning include the fact that children often ignore language corrections from adults. Instead, children typically follow a pattern of using an irregular form of a word properly, making errors later on, and eventually returning to the proper use of the word. For example, a child may correctly learn the word "gave" (past tense of "give"), and later on, use the word "gived." Eventually, the child will typically go back to learning the correct word, "gave". The pattern is difficult to attribute to Skinner's idea of operant conditioning as the primary way that children acquire language.

Chomsky argued that if a child would acquire language through behavioral conditioning, it would not likely learn the proper use of a word and suddenly use the word wrongly. (Harley, Trevor A., 2010) Chomsky believed that Skinner failed to account for the central role of syntactic knowledge in language competence. Chomsky also rejected the term "learning," which Skinner used to claim that children "learn" language through operant conditioning (Harris, Margaret, 1992). Instead, Chomsky argued for a mathematical approach to language acquisition that supports study of syntax.

In the second half of the 20th century, the influence of behaviorism was largely reducing as a result of the cognitive revolution (Saffran, Jenny R.,2003)(Saffran, Jenny; Aslin, Newport, 1996). This shift was due to methodological behaviorism being highly criticized for not examining mental processes and this led to the development of the cognitive therapy movement. In the mid-20th century, three main influences arose that would inspire and shape cognitive psychology as a formal school of thought:

(i) Noam Chomsky's 1959 critique of behaviorism, and empiricism more generally, initiated what would come to be known as the "cognitive revolution."
(ii) Developments in computer science would lead to parallels being drawn between human brain and the computational functionality of computers, opening entirely new areas of psychological thought. Allen Newell and Herbert Simon spent years developing the concept of artificial intelligence (AI) and later worked with cognitive psychologists regarding the implications of AI. The useful result was more of a framework conceptualization of mental functions with their counterparts in computers (memory, storage, retrieval, etc.)
(iii) Formal recognition of the field involved the establishment of research institutions such as George Mandler's Center for Human Information Processing in 1964. Mandler described the origins of cognitive psychology in a 2002 article in the *Journal of the History of the Behavioral Science (*Lany, Jill; Saffran, 2010).

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Skinner's behaviorism and Chomsky's innatism are very much contradictory when we judge them in terms of their individualistic theoretical bases. The theories, indeed, stress on two distinct hypotheses of language acquisition. This divergence has created a gulf between the theories. Several differences arise between the behaviourist and the innatist premise of language acquisition, which we can encapsulate in the following way:

Behaviourism	Innatism
Acquisition is an outcome of experience	Acquisition is an outcome of condition
Acquisition is a stimulus response process	Acquisition is a congenital process
Children learn language by imitation	Children learn language by application
Language learning is practice-based	Language learning is rule-based
Language acquisition is the result of nurture	Language acquisition is the result of nature
Stresses on observable behavior	Stresses on internal thought processes
Human mind is a blank slate	Human mind is no tabula rasa
Knowledge exists outside of individuals	Knowledge exists inside individuals
Learning is determined by the environment	Learning is determined by the individual
Learning requires formal guidance	Learning requires no formal assistance
Considers the child as a passive recipient	Considers the child as an active participant
Language learning is a mechanical process	Language learning is a creative process
Is a theory of behaviour, not of knowledge	Is a theory of knowledge, not of behaviour
Language is akin to other forms of cognition	Language is a separate module

Psychological research has recently progressed in the direction of regarding the human being like a mixture of genetically determined capacities and knowledge gained by experience (Konieczna). The human child, indeed acquires language from his/her environment by imitating behaviors of other members of society. But the innatist theory exclusively ignored this issue and viewed language acquisition as the unique product of LAD. Chomsky, the chief proponent of innatism, opined that exposure to language is a marginal prerequisite for the activation of the LAD, and is irrelevant to the actual learning process. But this innatist claim is not entirely satisfying because history (e.g., Genie, Victor) showed that the child cannot learn a language if he/she is isolated from society or human contact. Ruth Clark pointed out that: "Situation has a fuller role to play in language learning than Chomsky implies, though not precisely the role assigned to it by the behaviorists."

c) Differences between Innatism and Cognitivism

The neuroscientists found the evidence for innatism by working on the "Blue Brain Project." They discovered that neurons transmit signals despite an individual's experience. The linguists assumed that neuronal circuits are made when the experience of an individual is imprinted in the brain, making memories. Researchers at Blue Brain discovered a network of about fifty neurons. These neurons were like building blocks that contain difficult knowledge and later it would be added to acquired knowledge, like memory.[28] Scientists ran tests on the neuronal circuits of several rats and ascertained that if the neuronal circuits had only been formed based on an individual's experience, the tests would bring about very different characteristics for each rat. However, the rats all displayed similar characteristics as their neuronal circuits must have been established previously to their experiences–it must be inborn and created before their skill. The research done in the Blue Brain project expresses that some of the building blocks of all our knowledge are genetic, and we're born with it. (Pousaz, L., 2011)

VII. Findings

Some immediate findings may come out of the above discussions. Human brain is an active organ that is pre-shaped naturally and the neuronal functions shape most of the language activities. Cognitivism goes for highlighting the role of intelligence and memory for the acquiring a language. Human brain is not an empty vessel to be filled up with experience after its birth. Language acquisition is a very conventional phenomenon in all the human civilizations. It is somehow possible due to the presence of an Innate Language Universal in human brain since its birth. Cognition, or sense or perception or consciousness or understanding is evident all human brain that is secondary to innate ability. Innate ability is fundamental to the human in general. It is universal that lets people

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gather knowledge of language in a simple manner. Behavioral scientists support behavior and interaction for successful language development, whereas innatism believes that innate ability is responsible for language acquisition since infancy. Behavioral conditioning and reinforcement facilitate learning that exhilarates the pre-existed inborn capacity of a child. Behavioral theory mainly focuses on communication, not on grammatical correctness. It emphasizes fluency rather than accuracy. Whereas, innatism proposes "Universal Grammar Pattern." This theory claims that the deep structure of language at its deepest level may be universal to all languages. It also propounds a set of rules that would explain how children acquire their first language or how they construct valid sentences. Here Chomsky presented the existence of formal universals and substantial universals.[6] Chomsky is exceptional in this regard with innatist ideology and had protested Behaviorism strongly. He proposed that adult speech is so speedy and poorly constructed that it would be difficult for a child to learn a complete language so fast if it wouldn't have any prior neurological setup.

Chomsky's idea of Innatism has been empirically tested, discussed, and criticized since long and this doctrine achieved popularity more than others. Nature is more important than nurture according to the theory of innatism. Innatism is more authentic in the case of the Critical Period Hypothesis by Eric Lenneberg, (1964) who stated that if anyone doesn't learn a language before the age of 12, it could be most difficult to acquire any language in a usual and fully functional sense. Environment and conditioning will not function here anymore. Preexisting notion present in our mind is genetically preprogrammed according to the field of genetics, cognitive psychology, and psycholinguistics. The proposition of "Language Acquisition Device" (LAD) by Chomsky is another fruitful explanation in favour of innatism that offered how children develop competence in their first language in a relatively short time. Chomsky cleared it more by saying that Black Box or LAD is situated in Broca's area on the left side of the human brain. A complex set of neural circuits of this area are connected with universal grammar. Innatism is the focal point of interest of the linguists as this philosophy is highly logical and scientific. And if anything is scientific, its acceptability will be high. We know language in infancy is acquired rather than learned; children learn languages following some subtle and abstract principles. Explicit instructions or any other environmental clues don't have that much impact on language acquisition. Critics argued that no theory is absolutely standard to meet up the dispute regarding child language acquisition. Innatism can minimize much of the existing debates than the other theories.

VIII. Conclusion

It is nearly about two thousand years the conflict between nativism, and empiricism has been started. Empiricism is wrong since it tries to construct the mind out of nothing and Nativism is wrong for its attempts to make untestable assumptions about genetics and unreasonable proposals regarding the hard-coding of complex formal rules in neural tissue (Mac Whinny, 2005). On the other hand, the environmentalists who view language as 'genetically endowed and readymade' (Lightbown and Spada, 1999). Basically all of the chief language acquisition theories are focusing on the process of children's first language adaptation. Truly no theory could solely be successful in unlocking the language acquisition mystery at a time. Partial fulfillment is possible in these perspectives. In fact, there is a gulf of differences between theory and practice in the study on language advancement. Behavioral, and environmental theories are tended to highlight the parental and societal nurturing issues. But the empirical researchers found that there is little impact of adult speech and adult pressure on child language acquisition. Brown, Cazden and Bellugi (1969) and Brown and Hanlon (1970) have shown that parents' correction of children's ungrammatical sentences does not play a part in children's linguistic development. Specific cognitive or innate capacity in man is essential for learning. It is somehow logical to say that children are naturally conditioned rather than environmentally.

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