The Relationship of Cognitive Abilities and Language Acquisition

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Abstract

Language acquisition marks one of the most fundamental traits of a human being as he undergoes developmental changes. The brain not only stores information during the early years of language acquisition but also adapts to the language's grammatical uniformities. Language acquisition is a consequence of cognitive development and a well-studied process; however, whether it is dependent solely on the processes tied to cognition is still debatable. The expression actually prompts us to construct meanings rather than carrying meaning themselves by utilizing and building upon the processes we already know. Several modular perspectives now suggest that there are specialized mechanisms that control language development, and there is increasing evidence that cognitive agents are responsible for the learning of linguistic principles and patterns that were earlier only associated with general learning mechanisms. Moreover, research has shown a positive correlation between children suffering from lower motor functions and a reduced ability to acquire language learning, as well as a positive correlation between L2 language learning and higher cognitive functions. Implementing these findings in the multicultural environments found in many institutes in the developed world is significant to improving language acquisition among young children as well as older L2 language learners.

The Relationship of Cognitive Abilities and Language Acquisition

During childhood, one of the most interesting phases is the Child's language acquisition stage. The language acquisition process begins as an infant and continues until the Child reaches adolescence. Mastering a language could take even decades. Children can become competent in at least a single language within the age of three to five years. In recent times, there has been an increasing need to modify education to suit the multicultural environment found in many developed countries today. The educational needs of Children whose families do not speak English natively, for instance, have led to growing interest and research into the educational needs of children when it comes to language acquisition. The paper seeks to identify different theoretical perspectives and discuss the cognitive element and its relation to language acquisition in childhood language acquisition as well as L2 adult language learners and how different cognitive processes function to develop language. The paper also reviews studies and research that have employed varied methodologies that indicate adequate links between cognitive abilities and language acquisition.

The process of language development starts early in a human being's life. It begins by mimicking the sounds that are spoken. Babies at four months are able to distinguish between different sounds of speech and read lips. It begins with meaningless words by repeating what a human listens from others, and with growth, it starts those words begin to become meaningful, as connections between sounds and words are developed. These new associations and meanings keep on increasing as one gets older.

Four theoretical perspectives are among the theoretical perspectives that are accepted by theorists to explain language development. They include cognitive development, nativist, interactions, and behaviorist perspectives. Piaget was considered to be among the proponents of the cognitive development perspective. His research focused on how children see and understand the world around them, for which he suggested his famous four stages of cognitive development. He argued that children reason and think differently at each phase of their lives. According to him, there is a sequence of four qualitative and distinct stages that everyone passes through in his life. The participation of the learner is a central component of his theory of thinking and learning because knowledge, according to him, is not just transmitted verbally but must be reconstructed and constructed by the learners themselves. The child learns through acting on an objective, and his actions become the source of learning for him in order to construct knowledge of the world (David E. Freeman, 2002).

L2 language learning is also dependent on multiple factors. Some of them include social settings, learner characteristics, linguistic input, and age. Students tend to learn languages with greater ease than adults and are more able to quickly achieve near-native pronunciations and phonetic knowledge. In L2 language learning, the L1 language of the child serves as the foundation of his or her learning the new language. The social settings are dependent on three further variables that can affect learning: The L2 learner's role as an active participant and a listener, referents or instructors that can help in conceptual development or symbol formation, and a person who models the language being learned. The linguistic input is dependent on the quantity, quality, and overall comprehensibility of the L2 learner (David E. Freeman, 2002).

Learning an L1 language and L2 language has shown to correlate with greater cognitive ability, but the language itself does not do the cognitive building, rather it gives the learner sufficient, yet minimal clues for finding the principles and domains that are suitable for building it in a given situation. These clues are combined with available cognitive principles, one's existing configurations, and background framing to lead toward an appropriate construction. Language learning is complex and often defies common perceptions. It is commonly thought that we are the ones who put meaning into words or say what we want something to mean. But what is occurring at the backstage is far more complex and only the tip of the iceberg. In fact, language itself does not carry meaning, but it guides it.

The expression actually prompts us to construct meanings, rather than carrying meaning themselves, by utilizing and building upon the processes we already know. When something is uttered, what we

understand from it is not what the words themselves say because the words are not independent of the powerful cognitive processes or the richly detailed knowledge that we bring to bear. In a conceptual space, meanings are mental entities operating within; this is the foundation of cognitive linguistics. The meanings are inside people's minds and are not independent entities like the objectivist models suggest. The external world is only relevant in the sense that the meanings are constrained by the perceptions of human beings about the world (Turner, 2014).

Cognitive development itself is based on different theoretical perspectives and different factors. For instance, Piaget saw children of all ages as scientists who create theories within themselves about how the world around them works (Newcombe, 2013). Humans learn by themselves, and they follow four different stages during their transition into adulthood from infancy. They include sensorimotor, concrete operational, preoperational, and formal operational stages. Each stage has a part to play and a different purpose in the development of cognitive abilities, and everyone develops differently through these stages according to their own personal experiences of the world. The skills that children master in the sensorimotor stage are what they later build upon in their preoperational stage (R.D. Parke, 2009). It is at that time that a child's play becomes filled with fantasies and increasingly becomes imaginary. As they progress and develop better cognitive abilities with age, their play also changes and starts to involve more life-like scenarios and characters rather than make-believe plots, and rules begin to become sophisticated. Piaget sees it as an important part of brain development and not just fun (Oswalt, 2008).

The relationship between cognitive development and language acquisition has been the subject of debate between researchers for decades, especially during early childhood and infancy. Several modular perspectives now suggest that there are specialized mechanisms that control language development, and there is increasing evidence that cognitive agents are responsible for the learning of linguistic principles and patterns that were earlier only associated with general learning mechanisms. Cognition is a process of distributed learning, not just a solipsistic or individual development, in an environment of other objects, people, and events that are culturally structured. In social events, speech reflects how groups and individuals interact, prioritize, and conceptualize those events and objects. Based on how they use the language, children learn different patterns of social interaction. For instance, some parents may talk to preschool sons and daughters regarding past events while framing similar events a bit differently, for example, by using words that have more emotional descriptors when talking to their daughters. This results in a difference in usage later on by girls that may be different from boys (Deák, 2014). Thought and language are both interrelated and while teaching a foreign language, educators must inevitably train their students to develop cognitive and linguistic skills.

In contrast to other stances, Cognitive linguistics does not accept that there is a module in the mind that exists autonomously and uniquely for language acquisition, as is theorized by linguists such as Noam Chomsky and others. They do not deny that linguistic ability in a human being is innate. Rather, they deny the suggestion that it is a separate entity from the rest of cognition. Cognitive linguists see meaning in the form of conceptualization, departing from truth-conditional semantics, and hold

meaning in terms of different models of the world and through different mental spaces (ICLA, n.d.).

Vygotsky (1978) proposed two different stages in a child's cognitive and ability development. He saw the first developmental level to be the one where a child's mental functions are established as a result of already completed cycles of development and the other stage to be the proximal developmental level that determines a child's ability during the development process that has to do with processes that the child cannot complete independently, unless through a peer or an adult's assistance. The proximal developmental level in learning was emphasized by Vygotsky because it allows educationists to identify what students are in the process of learning and what they have acquired already. The developmental stages must be followed by the teachers in order to teach effectively and provide suitable assistance to students to let them internalize what they are learning (Yoshida, 2010).

Cognitive abilities affect language acquisition in different areas. Those children with better memory generally store, encode, consolidate, and retrieve representations of events and objects more. These skills are also crucial for language development. Better recognition and the ability to recall memory allows them, in fact, to produce memory traces that are persistent and highly discriminable. As a result, it is available more readily to link with their verbal referents. Conversely, those children who are limited in their ability to recall and recognize require more repetitions of those linkages in order to be proficient at the same level; this leads to slower vocabulary growth. Students can segment auditory streams into words and phrases, i.e., more meaningful units if they have better short-term memory, which also allows them to hold more information in mind at a time (Susan A. Rose, 2009). Similarly, it is rational to assume that limited processing speed limits the ability to keep up with the audio stream, thus interfering with the buildup of grammatical and lexical representations in language, essential for development. A child's attention provides him the ability to maintain, engage, shift focus, or disengage in a situation. This helps them acquire language quickly by following others' gazes, tracking the referents of others' communications, and engaging in bouts of joint attention (Susan A. Rose, 2009). Research suggests that in infancy, visually based basic cognitive processes contribute significantly to the development of language at an early age. It suggests that a language's cognitive bases are not just exclusive but can be of a domain-general nature as well, as the theories suggest (Susan A. Rose, 2009).

Performance differences in cognitive tasks performed in adolescence and childhood are said to be on account of processing speed, which serves as the main limiting factor in these cases. The developing cognition of an infant provides grammatical abilities that are foundational to generating semantic, symbolic forms, and progressive syntactic as well. These have implications for developing the necessary constraints and parameters for syntactic linguistic production, appreciation, and comprehension. Within each symbolic medium, the grammar that governs the generation of syntactic forms is unique and autonomous. The influences between language and cognition may become more mutual as language catches up to cognition by early childhood and late infancy. Symbolization has not only implications for concept formation but can also be used by children to expand or facilitate cognitive foundations once their initial construction is happening. Their play offer incorporates a

substitution of arbitrary and present for prototypic objects and the non-present. The cognitive elements, as a result, extend due to these symbolizations. At the age of 2 years, in fact, they begin to use language as a means to symbolize comparative values, the non-present, and amounts in often overpowerful ways. Therefore, language expands the range of thought by multiplying cognitive elements in three ways: It increases the context to which cognitions apply, and it provides a flexible notional and progressively abstract symbolic system of elements that are gradually disconnected from their reference objects (Melissa Bowerman, 2001).

It is not only cognitive abilities that researchers have demonstrated to have an effect on language acquisition but also vice versa, as some studies have indicated. Research by (K.M. Foster, 1989) correlated L2 language learning with instruments that were designed to assess metacognitive and cognitive processes and demonstrated that those students who took French lessons scored higher in three cognitive areas than the other students in the control group. Evaluation skills, considered a higher cognitive function in Bloom's taxonomy, were assessed to be higher in students who had better scores in the L2 language, and the longer they studied a different language, the better they performed. Another study by the 'British Autism Study of Infant Siblings' BASIS at Birkbeck found that a child's motor skills at seven months of age correlate with the language development of infants who later on developed ASD, suggesting that poor early motor or cognitive skills influence difficulties in learning a language. This is especially relevant to those who are considered at risk of developing ASD (Hayley Leonard, 2015).

When studying a foreign language, the human brain can utilize cognitive mechanisms of transfer and association to identify cognates in the proper context, even when coming across a new word or phrase. This happens through an association mechanism as linguistic input reaches the brain through hearing and sight sense, leading to the appending of verbal labels and recalling of mental representations. A cognate in the L2 language lets the brain match it to the meaning that is already known from the L1 language (Escribano, 2004). The brain receives and interprets language stimuli and responds to them. Neuroscience points us to consider short-term and long-term connections in the brain that are activated when they receive the right stimuli. Linguistic structures are also such functional depictions that require neural instantiation. The L2 learner has to utilize the same cognitive abilities in the learning process and confront the same processing problems in order to progress and develop an understanding (Escribano, 2004).

It is proven that as discourse unfolds, mental connections and spaces are built up as a function of linguistic expressions. When a language expression is used in discourse, the cognitive construction that forms as a result is out of both pragmatic conditions such as relevance, the social framing, and real-world events that are perceived by learners. When educators are teaching languages, especially within a multicultural environment, the design, philosophical position, or teaching strategies they employ should reflect the cultural and ethnic diversity and prepare necessary guidelines in consideration of the cognitive elements that affect language learning (Banks, 2005). When teaching an L2 language, the teachers should expect learners to use their cognitive skills in order to improve their linguistic skills by contrasting and comparing their own language with the target language,

which would allow them to hypothesize the target language's grammar rules. Cognition will allow them to reflect on their personal knowledge and experiences from other studies in order to understand the context of the content they are learning. Similarly, the cognitive linguistic approach to L1 language learning during childhood would also benefit educationists by stimulating effective language skills within their students.

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