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## Cognitive Prerequisites and Language Acquisition: A Developmental Perspective

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**ABSTRACT:** Learning is a cognitive process, because it is thought to involve internal representations that regulate and guide performance. The interrelations between language, cognition, and development have always been a matter of considerable interest to language teachers, applied linguists and psycholinguists. Regarding the language acquisition, these representations are based on the language system and include procedures for selecting appropriate vocabulary, grammatical rules, and pragmatic conventions governing language use. The main purpose of this paper is to investigate in some detail the cognitive processes involved in language learning in order to determine to what extent they can account for language learning.

**KEYWORDS:** Cognition, language acquisition, pragmatics, psycholinguistics.

### I. INTRODUCTION

Language acquisition depends on cognitive development and requires cognitive prerequisites or co-requisites. That is why cognition is seen as an underlying language skill. More specifically, children will not develop linguistic forms, before acquiring the cognitive bases for those forms. For example, the child will learn where-question (location answer) prior to the when-question (time answer), because the concept of a place is acquired prior to the concept of time and this order is cognitively determined. Therefore it is claimed that the order in which specific grammatical structures are required by language learners reflects their cognitive growth which develops before the learners' linguistic development.

The interrelations between language, cognition, and development have always been a matter of considerable interest to language teachers, applied linguists and psycholinguists. As Dromi (1993) points out, the 1970s and early 1980s can be characterized as "blooming decades" with respect to the number of publications on the nature of the linkage between cognitive development and language acquisition and on the possible directions of influence between these two domains of human functioning. That is why in the last decades, considerable attention has been paid to cognitive accounts of how language learning takes place and the extent to which they can be applied to learning (O'Malley; Chamont; Walker, 1987; Bialystok, 1985).

Brown (1994, p. 37) argues that there is a relationship between language and cognition. Hatch (1983) also claims that language is only one of the many analytical activities which depend on cognitive development and it is also true that cognitive development and language development may grow side by side in early childhood, an inter-relational model that sees cognition as the basis for language development. Of course evidence in support of this model may be strong in child language research and more data based research in the second language acquisition by adults is needed. Language acquisition is thus seen as having certain cognitive prerequisites or co-requisites.

That is why children will not develop linguistic forms before acquiring the cognitive bases for those forms. For example, the child is expected to learn the where-question/location answer prior to the when-question/time answer because the concept of a place is acquired prior to the concept of time, and this order is cognitively determined. Therefore the order in which particular structures are required by child language

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learners shows their cognitive growth. Hatch (1983), also claims that there is a parallel development of action and language features and that cognition is a common underlying mechanism for both. According to Felix (1987) different cognitive domains interact in actual language use and there can hardly be any doubt that children's intellectual and linguistic development involves cognitive processes which must in some way be interrelated.

## II. THEORETICAL COGNITIVE FRAMEWORK AND MODELS

The major theoretical framework within which the relationship between cognition and language development has been examined is Piaget's theory of cognitive development (Piaget, 1929, 1952). According to Piaget cognitive development is at the very center of the human organism and that language is dependent upon cognitive development. Piaget distinguishes four major consecutive stages in man's intellectual growth: the sensorimotor stage from 0 to 2, the preoperational period from age 2 to 7, the period of operational stage from 7 to 16, with a crucial change from the concrete operational stage to the formal operational stage around the age of 11. The most crucial stage for the consideration of first and second language acquisition appears to occur at puberty. Cognitively, we can make a strong argument for a critical period of language acquisition by connecting language acquisition and concrete formal stage transition. These considerations suggest that the human mind is equipped with cognitive systems.

Cognitive learning theory is another theory which views language learning as a complex skill which involves the use of various information-processing techniques to overcome limitations in mental capacity which inhibit performance (Ellis, 1992, p. 175). Ellis discusses that the cognitive learning theory is a powerful explanation of how learners develop the ability to use their L2 knowledge. According to Ellis (1992, p. 175) cognitive theory is the result of extensive research into the role that mental processing plays in learning. Ellis then adds that the cognitive theory seeks to explain three principal aspects of learning: 1) how knowledge is initially represented, 2) how the ability to use this knowledge develops and 3) how new knowledge is integrated into the learner's existing cognitive system (Ellis, 1992, p. 176).

### **Bialystok model**

The most developed cognitive theory of L2 learning is that of Bialystok (Bialystok, 1979; Bialystok; Sharwood-Smith, 1985). Like other cognitive psycholinguists who have addressed L2 learning, Bialystok affirms the principle that language is processed by human mind in the same way as other kinds of information (Bialystok, 1988, pp. 32).

### **Early cognitive development**

Ingram (1991) points out that an aspect of the infant's paralinguistic development is cognitive development. By cognitive development he means the infant's growing knowledge of the world around him. Ingram argues that the study of the infant's cognition is of great importance in two specific ways: To understand what the child means by its words, and to explore the role that cognition growth may play in language development. For example, must certain cognitive developments take place before certain linguistic ones may occur? In other words, does the child's cognitive ability limit or constrain, for example, semantic development just as early physiological structure limits the infant's speech production?

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## III. COGNITIVE THEORY AND SECOND LANGUAGE LEARNING

Cognitive theory is based on the works of psychologists and psycholinguists. Applied linguists and language teachers working within this framework apply the principles and findings of the cognitive learning theory to the domain of second- language learning (McLaughlin, 1993, p. 133). Their attempts have been based on the assumption that L2 learning is not different from other kinds of complex skill learning. Within this framework, second-language learning is viewed as the acquisition of a complex cognitive skill. McLaughlin (1993) argues that to learn a second language is to learn a skill, because various aspects of the task must be practiced and integrated into fluent performance.

McLaughlin believes that learning is a cognitive process, because it is thought to involve internal representations that regulate and guide performance. Regarding the language acquisition, these representations are based on the language system and include procedures for selecting appropriate vocabulary, grammatical rules, and pragmatic conventions governing language use (McLaughlin, 1993, p. 134). Meanwhile, according to Cognitive theory, second-language learning, like any other complex cognitive skill, involves the gradual integration of sub-skills as controlled processes initially predominate and then become automatic. Therefore, cognitive theory needs to be linked to linguistic theories of second-language acquisition. In fact, as McLaughlin states, learning a second language involves the acquisition of a complex cognitive skill, but it involves the acquisition of a complex linguistic skill as well (McLaughlin, 1993, p. 150).

According to O'Malley, Chamont and Walker (1987, p. 288), cognitive theory suggests that language-related codes and structures are stored and retrieved from memory much like any other information, and that language acquisition follows the same principles of learning as other complex cognitive skills. Cognitive-code teaching assumes that 'once the student has a proper degree of cognitive control over the structure of a language, facility will develop automatically with the use of language in meaningful situations.' (Krashen 1982, p. 133). Krashen then states that cognitive code attempts to help the student in all four skills, speaking, listening, reading and writing. Cognitive code also posits that competence precedes performance.

Meanwhile Ellis (1992, pp. 184) suggests:

- a) in developing a theory of L2 learning it is necessary to distinguish 'knowledge' and 'control' and to take into account both linguistic and cognitive factors.
- b) a cognitive theory is unable to explain the sequence of acquisition of grammatical structures.
- c) a cognitive theory is unable to account for the part played by explicit knowledge and cannot, therefore, fully explain how formal instruction contributes to L2 acquisition.

## IV. IMPACT OF COGNITIVE LOAD ON TASK DIFFICULTY

Cognitive load has also been an explanatory construct for observed task difference (Brown; Yule, 1983; Givon, 1985; Sweller, 1988; Sachs, 1983; Hatch, 1983; Robinson, 1995; Rahimpour, 1997, 2007). There are also a lot of evidences in literature, which claims that difficulties are sometimes related to the cognitive load imposed by a task. It is also discussed that cognitive operations are involved in oral narration and consequently part of the complexity and difficulty of tasks lies with the cognitive load imposed by the tasks on learners. That is why it is argued that some tasks are cognitively difficult. Sachs (1983), Robinson (1995) and Eisenberg (1985) argue that the ability to make reference to events in a there- and-then context-unsupported condition involves a number of cognitive operations, conversational abilities and linguistic resources which are not necessary when talking about objects and events that are visible while conversation is taking place. Consequently, the emergence of displaced reference happens much later in L1 than reference to the here-and-

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now.

It is also argued that young children are cognitively incapable of conceiving of events displaced in time and can only encode reference to the here-and-now. Brown and Yule (1983) emphasize that it is the cognitive load, which is the complicating factor rather than the linguistic form. In line with this idea, MacNamara (1972) proposes that the child possesses nonlinguistic cognitive processes before he learns the linguistic signal. More clearly, Macnamara emphasizes that development of basic cognitive structures should precede the development of comprehending linguistic structures. He adds that just because the acquisition of linguistic structures is spread over a long period, there is no reason that the acquisition of corresponding nonlinguistic ones should also extend well into the period of language learning. MacNamara's proposal is confirmed by Hatch (1983, p. 219) who argues that language is only one of many analytic activities which all depend on cognitive development. That is, children will not develop linguistic forms before acquiring the cognitive bases for those forms. For example, a child is expected to learn where/location answer before the when/time answer, because the concept place is acquired before the concept of time and this order is cognitively determined. That is why cognition is seen as underlying language skills. McLaughlin also suggests that second language learning is viewed as the acquisition of complex cognitive skill.

## V. CONCLUSION

The overall conclusion reached was that language acquisition depends on cognitive development and requires cognitive prerequisites or co-requisites. That is why cognition is seen as an underlying language skill. More specifically, children will not develop linguistic forms before acquiring the cognitive bases for those forms. This study thus provides additional evidence to support earlier findings in this domain. The findings of this study also have pedagogic implications in foreign / second language teaching, testing and syllabus design and to understand specific grammatical structures which are required by language learners to reflect their cognitive growth before the learners' linguistic development.

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