

Mother Tongue, a Necessary Step to Intellectual Development

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Intellectual (cognitive) development, the emergence of increasingly sophisticated forms or levels of understanding, reasoning, and rationality is an ongoing process of reflection, coordination, and social interaction that begins in early childhood and continues, at least in some cases, long into adulthood (Moshman, 2003). In this process, language is a primary tool in the entire life. However, it is not to say that thinking (as an intellectual ability) cannot take place without language (Munn, 1951), but rather mostly, thinking is mediated by language and thus develops to a much higher level of sophistication. The intimate link between language and cognitive development forms the core of the present article. It focuses on the important contribution of mother tongue in the process of cognitive development. Two major theories of development: Piaget and Vygotskys' views are investigated in relation to language. It is concluded that, although thought is the base, language intellectualizes it to a great deal.

Key Words: mother tongue, intellectual development

1 Introduction

Mother tongue (first language, native language, or L1) is essential for learning as a part of intellectual ability. Mother tongue is the language human beings acquire from birth. It helps the child in his/her mental, moral, and emotional development. Schick, de Villiers, and Hoffmeister (2002) in their study explain that language delays typically observed in deaf children are causally related to delays in major aspects of cognitive development. They maintain, children who cannot understand complex syntactic forms like complements have difficulty understanding how their own thoughts and beliefs may differ from those around them. In fact, much of a child's future social and intellectual development hinges on the milestone of mother tongue (Plessis, 2008). Mother tongue, therefore, has a central role in education that demands cognitive development.

1.1 The role of mother tongue in education

Education is a potential instrument for encouraging independent thinking among the learners. Students should be allowed and encouraged to come up with their own opinions and interpretations of events around them. The curriculum for primary

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school / elementary school in mother tongue, emphasizes the importance of the individual's personal and intellectual development.

Studies show that children who come to school with a solid foundation in their mother tongue develop stronger literacy abilities. Overall, the research is very clear about the importance of children's mother tongue for their personal and educational development (Baker, 2000; Cummins, 2000; Skutnabb-Kangas, 2000 cited in Cummins, 2000). When parents spend time with their children and tell stories or discuss issues with them in a way that develops their mother tongues' vocabularies and concepts, children come to school well prepared to learn and succeed educationally.

In 2002, FAO (Food and Agriculture Organization of the United Nations) asserts that the intellectual development of children is very much linked to the language they speak; if they are taught in their mother tongue, their intelligence develops.

When children are learning through their mother tongue, they are learning concepts and intellectual skills that are equally relevant to their ability to function in their entire life. In other words, according to 2008 newsletter of UNESCO (United Nations Educational, Scientific and Cultural Organization), "Learning in the mother tongue has cognitive and emotional value..."(P.5).

Also Krishnaji (1990) claims, several psychological, social and educational experiments proved that learning through mother tongue is deeper, faster and [more] effective. In fact, by using the students' mother tongue in the classroom to teach subject content, the students' cognitive skills would be developed (Dumatog and Dekker, 2003).

Briefly, by teaching concepts in the mother tongue, students would be exposed to comprehensible input and enabled to develop concepts.

1.2 The role of mother tongue in second language learning

Incomplete first language skills often make learning other languages difficult. Cummins (2000) emphasizes, the level of development of children's mother tongue is a strong predictor of their second language development. When the mother tongue is promoted the concepts and literacy skills can transfer to the second language. Further, a high correlation between learning to read in mother tongue and subsequent reading achievement in the second language has been found. (Koda, 2005).

In short, supporting development of the mother tongue enhances the development of the second language learning.

2 Major theories of cognitive development

Reber (1995) in the Dictionary of Psychology refers to *intellect* as "rational thought functions of the human mind". However, he continues: "today it is a generic term covers the cognitive processes as a whole"(P.379). Therefore, the terms intellect and cognition are used interchangeably.

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Moreover, Reber defines the word *cognition* as a broad term, which has been used to refer to such activities as thinking, conceiving, reasoning, etc... So, cognition is an umbrella term that covers all of the mental activities that we engage in; our thoughts and thinking.

Thinking is not a simple process. Thinking (or cognition; the two terms are interchangeable) is a complex procedure that is made up of many other processes (Taylor, 2005). Language as a process of thought is a complex system in its own turn. In deed, language is the great manifestation of thought that once acquired helps development of cognition and later on, enhances higher intellectual functioning.

Discussion of the relationship between cognition and the child's emerging use of language generally refers to Piaget and Vygotsky. The most well-known and influential theory of cognitive development is that of Jean Piaget (1896–1980). Piaget's theory grew out of decades of extensive observation of children, including his own, in their natural environments as opposed to the laboratory experiments of the behaviorists. He viewed cognitive development from biological perspective.

The work of Lev Vygotsky (1896-1934) has become the foundation of much research and theory in cognitive development as well. Vygotsky has developed a socio-cultural approach to cognitive development. He developed his theories at around the same time as Piaget was starting to develop his theories. Brief reviews of these two theories are as follow:

2.1 Jean Piaget's theory of cognitive development

Based on Richmond's (1970) explanations of Piaget's theory, Piaget proposed, intellectually developing children organize their experiences into *schemes* (organized patterns of action or thought) that help them understand the world. In Piaget's theory, two major principles operate on scheme development: *adaptation* and *organization*.

Humans desire a state of cognitive balance or equilibration. When the child experiences cognitive conflict (a discrepancy between what the child believes the state of the world to be and what s/he is experiencing) adaptation is achieved through *assimilation* or *accommodation*.

Assimilation involves incorporating new information into previously existing structures or schema.

Accommodation involves the formation of new mental structures or schema when new information does not fit into existing structures.

Organization refers to the mind's natural tendency to organize information into related, interconnected structures. Scheme is the most basic structure.

Further, based on Richmond, at the center of Piaget's theory is the principle that cognitive development occurs in a series of four distinct, universal stages. These stages always occur in the same order, and each builds on what was learned in the previous stage. A brief description of each stage is as follows:

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1. Sensorimotor stage (Infancy to 2 years): In this stage, knowledge of the world is limited. It is only based on immediate physical interactions and experiences. The child is using motor activities. Children acquire object permanence (knowing an object exists when it is out of sight), in this stage. Mobility allows the child to begin developing new intellectual abilities. Language as a symbolic ability is developed at the end of this stage.
2. Pre-operational stage (Toddler and Early Childhood; 2 to 7 years): In this stage, the child's knowledge is dominated by the external world. The child only focuses on one aspect of something at a time. Thinking is done in a non-logical, non-reversible manner (lack of the ability to perform a mental operation and then reverse one's thinking to return to the starting point). Egocentric thinking (believing that everyone views the world as I do) predominates.
3. Concrete operational stage (Early adolescence; 7 to 11 years): In this stage, intelligence is demonstrated through logical and systematic manipulation of concrete objects. Operational thinking (reversibility) develops. Egocentric thought diminishes.
4. Formal operational stage (Adolescence and adulthood; 11 and above): In this stage, intelligence is demonstrated through the logical use of abstract concepts. The abilities to generate abstract propositions and hypotheses and to predict possible outcomes are evident. Problems are approached in a systematic way. Formal logical systems can be acquired. However, Cook and Cook (2005) maintain, many people do not still think formally during adulthood.

Piaget's accounts of stage development have been challenged on several grounds: development does not always progress in the smooth manner his theory seems to predict. In the meantime, "research has established some cases in which Piagetian tasks can be taught to children at earlier developmental stages" (Gardner, 1982, cited in Slavin, 1994, P.44). More broadly, Piaget's theory is domain general, predicting that cognitive maturation occurs concurrently across different domains of knowledge. However, there are new trends in cognitive science away from domain generality towards domain specificity, meaning that, the child's levels of developments in different thinking or cognitive arena are different.

2.1.1 Implications of Piaget's theory in education

Piaget's theoretical arguments about the nature of cognitive development, nevertheless, have direct implications in education. Developmentally appropriate education in which materials and instruction are suitable for students in terms of their cognitive abilities is very important. That is attempts to ask questions or explain things to children before they are mentally ready cannot help to their development. Indeed, premature questioning or explaining frustrate the child who cannot understand what s/he is taught. In preschool and elementary school, for

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example, children need to see physical representations of ideas or concrete examples of concepts.

Moreover, teachers should allow children to act upon the world with objects and tasks that serve to foster their understanding of invariance. While observing this point, teachers should not enforce correct answers. Instead, children must be free to construct their own understanding.

According to Berk (1991, cited in Slavin, 1994) the main educational implications drawn from Piaget are "A focus on the *process* of children's thinking, not just its product. And recognition of the crucial role of children's active *involvement* in learning activities..." (P.45)

Piaget's theory also suggests that students' intellectual development in educational setting demands organized curriculum to lead their minds toward equilibration, creativity and knowledge expansion. In other words, schools should design syllabi that encourage a balance between assimilation and accommodation. Because these twin processes are "permanent features of the working of intelligence" (Richmond, 1970, P.89).

2.1.2 The role of language in Piaget's theory

Based on Becker and Varelas (2001), "Piaget related the importance of social interaction for intellectual development to the role of language..."(P.22). They quote Piaget statement: "The isolated individual would never be capable of complete conservation and reversibility...and it is the exigencies of reciprocity which allow this double conquest, through the intermediary of a common language and a common scale of definitions"(ibid.). They mention however that the role of language for Piaget changed in his later works. In Piaget's account, "it took me some time to see, it is true, that the roots of logical operation lie deeper than the linguistic connections"; "my early study of thinking was centered too much on its linguistic aspects"; "some forty years ago, during my first studies...I believed in the close relation between language and thought" (Piaget, 1972/1973, cited in Becker and Varelas, 2001, P.23). As a result, it is evident that language for Piaget comes after thought or cognition. For him, "language primarily reflects thought and does not shape it..." (Elliot, 1994, P.40). Etiologically speaking, it is quite reasonable. However, in later stages of development, language can shape thought as well. As Vygotsky argues, language determines thought development ... (Vygotsky, 1962, cited in Elliot, 1994).

Piaget in his theory of the child's cognitive development refers to *egocentric speech* in the preschooler as well. Piaget's conception of child egocentric speech is of primary significance in his theory. In egocentric speech, the child talks only about himself, takes no interest in his interlocutor, does not try to communicate, expects no answers, and often does not even care whether anyone listens to him. In Piaget's account once the child reaches the stage of concrete operations, egocentric speech simply *disappears*. Because the child is now aware of the need to make what he says accessible to his listener and has the intellectual competence to learn how to make himself intelligible (Wood, 1998). Language for him is a "system of symbols

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for representing the world, as distinct from actions and operations which form the process of reasoning"(Wood, 1998, P.25). However, in Vygotsky's view, as follows, language can make reasoning and other mental functions possible.

2.2 Lev Vygotsky's socio-cultural theory of cognitive development

The major theme of Vygotsky's theoretical framework is that *social interaction* plays a fundamental role in the development of cognition (Vygotsky, 1978, cited in Slavin, 1994). For him, full cognitive development requires social interaction. In another word, individual's development is a result of his or her *culture*. He states, "any function in the child's cultural development appears twice, or on two planes. First it appears between people as an inter-psychological category, and then within the child as an intra-psychological category."(Vygotsky, 1981, cited in Cook & Cook, 2005, P.194)

In Vygotsky paradigm culture makes two sorts of contributions to the child's intellectual development. First, children acquire much of their thinking (knowledge) from it. Second, children acquire the means of their thinking (tools of intellectual adaptation [language] from the surrounding culture.

He views cognitive developments as a dialectical process, where the child learns through shared problem solving experiences with someone else, such as parents, teacher, siblings or a peer. *Zone of Proximal Development (ZPD)* in Vygotsky's theory means, "The distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with a more capable peer" (Vygotsky, 1978, P.86). In 1976 Wood, Bruner and Ross invented the term *scaffolding* to describe tutorial interaction between an adult and a child.

In Vygotsky's account, adults transmit to children the rich body of culture through their speech. Then the child's own language, as learning process, comes to help his or her intellectual transformation.

Concerning internal speech (egocentric speech in Piaget's view), Vygotsky's view is that children can use their own internal speech to direct their own behaviour in much the same way that their parents' speech once directed it. This transition reflects the Vygotsky's theme of development as a process of *internalization*. Therefore, unlike Piaget, Vygotsky views egocentric speech as a transition from social speech to internalized thoughts or *inner speech*. For Vygotsky egocentric speech is a transition between the child's acquiring language in a social communicative context, and attempting to internalize it as an inner speech (i.e., thoughts). He argues, "Besides being a means of expression and of release of tension, [egocentric speech] soon becomes an instrument of thought in the proper sense – in seeking and planning the solution of a problem..." (Vygotsky, 1986, P.31). In his words: "this speech becomes gradually intellectualized and starts serving as a mediator in purposive activity and in planning complex actions" (ibid. P.39).

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However, Piaget refers to this early form of speech in a way that the child is unable to use speech to interact with others; Piaget sees egocentric speech as characteristic of an "imperfectly social phase of the child's development, soon to disappear"(Elliot, 1994, P.40). Vygotsky argues, on the other hand, that "egocentric speech serves an intellectual purpose for children and does not disappear at age seven but is internalized to form inner speech and verbal thinking" (wood, 1998, P.:30). For Vygotsky, this speech, at first, is social. In other words, the main purpose of language for children is social. They use the language to obtain the help of others and to solve problems. Social interaction plays an important role in the transformation and internalization processes.

Therefore, in Vygotsky's paradigm, besides its communicative function, language also has a guiding, regulating function. From this regulating function, self-regulation (the direction of one's own behavior) develops (Zivin, 1979; Van Uzendoorn and Van der Veer, 1984, cited in Van Uzendoorn and Van der Veer, 1985).

In his account,"child logic develops only along with the growth of the child's social speech and whole experience ... it is through others that we develop into ourselves... and ... this is true not only with regard to the individual but with regard to the history of every function ... any higher mental function was external because it was social at some point before becoming an internal, truly mental functioning"(Meadows, 1993, P.237).

Some psychologists criticize Vygotsky's central theme that higher psychological processes are formed by cultural processes including semiotic concepts, rather than by biological ones (Ratner, 2008). According to this view, biology determines most of the content of psychological phenomena, and social processes have a marginal effect.

Nevertheless, like Piaget, Vygotsky claims that infants are born with the basic abilities for intellectual development or *elementary mental functions* (such as attention, sensation, perception and memory). Eventually, through interaction within the socio-cultural environment, these are developed into more sophisticated and effective mental processes, *higher mental functions*.

2.2.1 Implications of Vygotsky's theory in education

As mentioned, one of Vygotsky's main contributions to education is his concept of zone of proximal development: the gap that exists for an individual between what s/he is able to do alone and what s/he can achieve with help from more knowledgeable person. Individuals' potentialities are different. "Some children have larger zones of proximal developments than others, even when their existing levels of performance are similar" (Wood, 1998, P.27). Piaget's theory, however, has little to say about this issue. For Vygotsky, co-operative learning lies at the foundation of development. In sum, in his theory, social interaction plays more important role in the development of children's thinking and learning than what Piaget's theory implies.

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Further, in Vygotsky's argument, "instruction (formal and informal) is the main vehicle for the cultural transmission of knowledge" (Wood, 1998, P.27). Cultural systems (language, science, book...) increase the individuals' intelligence.

2.2.2 The role of language in Vygotsky's theory

Vygotsky's theory focuses heavily on language and social interaction, and the role they play in helping learners acquire the culture in which they live. In his theory, language is the tool people use for cultural transmission, communication, and reflection on their own thinking. For him language is the most important *psychological tool* that *mediates* our thoughts. Based on Nicholl (2008) accounts of Vygotsky's theory, "language is the tool that enables emergence of self-awareness and consequently voluntary control of [one's] actions". Initially it is the adult who says yes or no to the child, and then the child will say yes or no to her or himself. In other words, "an inner process stands in need of outward criteria..." (Wittgenstein, 1953 cited in Nicholl, 2008). So, for Vygotsky, the goal of development is to make the transition from being other-regulated to becoming self-regulated.

In short, according to his theory, language has two specific roles in cognitive development: *communication* and *regulation*. Communication is important in the transmission of culture. Regulation is important in gaining control over one's own cognitive processes (e.g., thoughts, memory, etc.). He puts forward: "In growing up within linguistically structures and sustained relationships the child begins to perceive the world not only through its eyes but also through its speech. And later it is not just seeing but acting that is informed by words." (Vygotsky, 1978, P.:32 cited in Edwards, 2004).

Further, based on Schütz (2004) another theme of Vygotsky's theory is that language and thought start as separate processes with different roots, but gradually unite to influence each other through social learning that actually leads to cognitive development. At first, thought is nonverbal and language is nonintellectual. Then, thought becomes verbal and speech becomes rational.

However, it worth reminding that it is plausible to believe in cognition to be the foundation for language ability (Slobin, 1966; Fodor, 1966, cited in Derwing, 1974). Vygotsky himself maintains that: "thought undergoes many changes as it turns into speech..." (Golub and Reid 1989, P.46). Therefore, it can be inferred from Vygotsky 's account that more or less (though implicitly) he like Piaget, supports the notion that language originates from thought. In his book *thought and language*, he maintains, "It would be wrong, however, to regard thought and speech as two unrelated processes, either parallel or crossing at certain points and mechanically influencing each other." (Vygotsky, 1986, P.211). In later developmental procedures, however, he emphasizes much more on the role of language in intellectual development. Until he asserts, "thought development is determined by language, i.e., by the linguistic tools of thought and by the socio-cultural experience of the child" (Vygotsky, 1962, cited in Elliot, 1994, P.41). His proposal is logical and appropriate once the child masters his/her mother tongue. Nevertheless, before

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mastering mother tongue, Piaget's view that focuses on cognitive achievements and development is more plausible.

3 Conclusion

A quick look at the brief account provided in this short article shows that Piaget's theory grounded in scientific and epistemological (how do we know what we know) understanding of how children's knowledge of the world develops. There is no doubt that his work is important for the investigation of intellectual development. It describes the nature of cognitive development. However, children need more than experiences with the environment; they also need to interact socially. Nevertheless, Piaget (1969, cited in Vygotsky, 1986) himself asserts,

"If there were not other people, the disappointments of the experience would lead to overcompensation and dementia. We are constantly hatching an enormous number of false ideas, conceits, utopias, mystical explanations, suspicions, and megalomaniac fantasies, which disappear when brought into contact with other people. The social need to share the thought of others and to communicate our own with success is at the root of our need for verification. Proof is the outcome of argument..." (P.48).

Meanwhile, language accelerates cognitive development. Therefore, Vygotsky's theory, more or less, complements that of Piaget's to perfection by adopting innovative orientation to the role of language in the development of intellect. Vygotsky's theory suggests that language is more important than what Piaget implies. In Vygotsky's view through language, we construct reality. Without the words to think and communicate, our lives would be very different from what it is. He places more emphasis on the role of language, culture and social factors in shaping cognitive development. Becker and Varelas (2001) conclude, "through his early ideas on language, Piaget offers an avenue for extending Vygotsky's approach to the interplay of conceptual and semiotic aspects in intellectual development"(P.23).

Indeed, before acquiring language, the child is able to convey her/his purposes and wishes by pointing to objects. The child first recognizes things, and then learns to make use of language. Therefore, neurologically, cognition is the basis with different processes, (perception, intelligence, imagination, intentionality, memory, creativity...). One or the complex processes, which makes endeavor to express intention, reveals itself through language, through nerve system and speech organs. When the child masters his/her mother tongue through interacting with others, language helps in intellectual functioning.

Concisely, thought originally leads way to language, then language leads way to thought as well and the circle continues throughout all of life. The idea is that, "the relation of thought to word is not a thing but a process, a continual movement back and forth from thought to word and from word to thought..."

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(Vygotsky, 1986:218). Despite, "many of the thoughts we are capable of are not completely determined by our language"(Whitney, 1998:136).

Overall, both Vygotsky and Piaget recognized the complementary nature of cognition, social interaction and language, as well as the complex nature of development. However, they had different emphases in their theoretical propositions. Piaget emphasized on maturational processes in the developmental route. Vygotsky stressed on the socio-historical mediation of meaning from social context to individual realization.

Another important concluding point is that from phylogeny view (evolution of species), the distinction between human beings and other species is located in human's higher intellectual ability, which is empowered by primary psychological tools such as language. That is "Our ability to use language to transmit our thoughts to others has been crucial to the survival of our species"(Whitney, 1998, P.136).

Finally yet important, on the relationship between language and thought Vygotsky reminds that: "*thought undergoes many changes as it turns into speech. It does not merely find expression in speech; it finds its reality and form.*"(Golub and Reid 1989, P. 46).

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