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PRIVATE SPEECH AND COGNITIVE DEVELOPMENT: A REVIEW OF THE TWO THEORIES

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ABSTRACT

This paper reviews the psycholinguistic phenomenon of private speech (i.e., self-directed speech) in verbal communication. Private speech was first introduced by two main characters in psychology Lev Vygotsky, the founder of a theory of human cultural and bio-social development commonly referred to as cultural-historical psychology and Jean Piaget, the Swiss developmental psychologist who essentially viewed private speech as evidence of egocentrism and the inability to take the perspective of others [18]. Private speech, or speaking aloud to oneself, is a phenomenon of child development that Vygotsky interpreted as the critical transitional process between speaking with others and thinking for oneself and Piaget considers it as a sign of cognitive immaturity and believes it develops into a fully mature and effective speech as children grow cognitively and gain communicative skills. Lev Vygotsky and Jean Piaget first introduced the private speech; in the three past decades, it has absorbed more attention from researchers. The researchers pointed out to a positive correlation between the application of private speech by children and their task performance and achievement, the fact that had already been noted by Vygotsky. This paper also discusses the theoretical origins of research interests in this field, and disagreement between, Piaget and Vygotsky, and reviews some works of other scholars and the role of private speech in children and adults as well [including some in L2 research] in various settings from a Vygotsky and Piaget perspectives. It also introduces the role of private speech in cognitive development and its contribution in language development, social development, and communication. While discussing the theories of Piaget and Vygotsky, it reflects the viewpoints of these two outstanding figures in their perspectives and the way they see the cognitive development and summarizes the studies conducted in this area. It also supports the view that private speech provides a self-regulatory function and guides behavior and problem solving.

INTRODUCTION

There are numerous theories developed to explain how cognitive development occurs in children. These theories attempt to explain how children's cognitive development occurs, what happen at the time of thinking, and what factors impact children's cognitive development. In the course of cognitive development, private speech plays a key role, which has been considered by scholars in the last decades. Private speech is defined as speech that is not explicitly addressed to another person and thus serves no apparent interpersonal communicative function [2]. Ohtadefines private speech as "audible speech not adapted to an addressee" [3]. The phenomenon has theoretical significance within both Piaget's and Vygotsky's works [4, 5]. It is a type of speech directed toward the self for communication and self-guidance of behavior. Private speech, or speaking aloud to oneself, is a phenomenon of child development that Vygotsky interpreted as the critical transitional process between speaking with others and thinking for oneself. It usually occurs among children around the ages of 2, when they begin to speak, and vanishes around the age of seven [6]. The idea is that private speech first occurs at the end of an action (reactions to one's actions), then during the action [describing one's own behavior], and finally before a child's behavior occurs (self-guiding speech) [7, 8]. Although a few studies have been conducted to reflect empirical support of changes when the private speech occur [9,10], the majority of them did not differentiate development in the timing of children private speech with respect to action [11,12,13,14]. Private speech has obtained a lot of consideration during the past 3 decades. Numerous studies have been conducted which indicate a positive correlation between the application of private speech by children and their achievement in performing a task [15].

As they become more proficient with word meanings and grammar, a child becomes capable of participating more fully in activities and conversations that involve higher psychological functions, such as planning and problem solving. This kind of speech is typically defined, in contrast to social speech, as speech addressed to the self (not to others) for the purpose of self-regulation (rather than communication) [16]. When children are engaged in private speech they talk to themselves and although it is audible, it has no addressee and is not directed to anyone [17].

In 1932, Piaget published "The Language and Thought of the Child". In this book, he brings his records and observations of children talking to themselves and he termed it "egocentric speech" which was the core of private speech. He sees it as a sign of cognitive immaturity and believes it develops into a fully mature and effective speech as they grow cognitively and gain communicative skills.

KEY WORDS

private speech; Piaget; Vygotsky; cognitive development; language development

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On the other side of the spectrum is Vygotsky. In his book “thought and language”, Vygotsky writes that self-talk or private speech is a part of the process of normal development of communication, self-guidance, self-regulation of behavior, planning, pacing, and monitoring skills[19]. Vygotsky explains that private speech arises from children’s social interaction and it develops into talking aloud when they reach kindergarten or preschool age [7].

Both, Piaget and Vygotsky, were interested to study the children cognitive development and use of private speech by children. However, they had very different attitudes toward the role private speech plays in one’s cognitive development. Their different approaches to this phenomenon (i.e., private speech) highlighted their fundamental differences about how human cognitive development proceeds.

Piaget’s theory of cognitive development was built upon three main principles, namely, assimilation, accommodation, and equilibration.

Assimilation is the process of adding new experience and information into already existing mental structure (schemas) [20]. As children grow, they develop cognitive structures to assist them make sense of their surroundings and world and when they face a new experience, they add it up to the already existing schemas. This is an ongoing and active process.

Children are not merely taking information and knowledge through absorption; they are actively involved in the process of assimilation. Among the pile of information, they select the ones that interest them, thus they do not grasp all the information they face.

Accommodation is the reshaping of an already existing schema because of a new experience. For example, a child may bear in mind and have a schema that all flying objects are birds, but when he encounters a Frisbee, he understand that it does not match the schema. It does not breath and isn’t alive; therefore a new schema must be built. As children grow, they face the experiences, which the present schema is unable to explain. Therefore, a new experience demands new schemata.

Equilibration is the process of looking for achieving cognitive stability through assimilation and accommodation [20].The child is always looking for understanding and interpreting what new experience they encounter. The child has an image of the world in his mind to understand it and sees how it works, but it become challenging when he faces a new experience which do not fit the current schema and understanding. They attempt to build schemata to interpret the new experience. As result, all these interpretations and come together to build an image of the world and make equilibrium. However, this equilibrium changes constantly since the child experiences new things and it creates disequilibrium and it continues until assimilation or accommodation has taken place.

Piaget believed that a child cognitive development goes through different stages. Assimilation and accommodation are two processes in which the child’s brain develops through the natural process of maturation. Thus, they can comprehend and understand the world around them and the ability of interpreting and predicting the world develop. Piaget stated that there is a positive and strong relationship between cognitive development, gradual, and biological maturation of the brain. According to him, the brain develops and matures and consequently the thinking matures and the understanding develops. Piaget, who wrote about child psychology, stated that thought could be followed in symbolic play during and at the end of the first years of life. Piaget does not think that the words of a child, when began, do not show any that the child is expanding thought development. Rather, he thinks that the process of thinking is only related to mental actions, which have been built through practical operations. Piaget believes that private speech is an evidence of egocentrism as well as inability to take the perspective of others [18]. Piaget viewed private speech as a sign of egocentrism and a cognitive deficiency which is represented through the inability to take the perspective of others and therefore engage in a reciprocal conversation with others [21].

Piaget observed and followed the activities of the kindergarten children and recorded them [22]. He concluded that children use verbal repetitions of others, monologues during an activity. In these instances, the child’s utterances had no addressee and did not direct toward any other individuals. Piaget thought that private speech is a sign of cognitive immaturity. However, he believes that as the children get older and socialize with other people, private speech vanishes gradually and communicative speech takes its place. Self-speech moves away and changes to other-oriented. It shows that they can share their perspectives with the others. By the age of seven or eight, egocentrism fades away by emergence of critical and logical thinking.

In contrast to Piaget’s theories about child development, Vygotsky stated that social learning precedes development. He believed that cognitive development proceeds from being social to individual. In other words, a child’s cognitive development originates in socialization activities (e.g., mother-child interactions) and then goes through a process of increasing individuation. Vygotsky thought differently from Piaget and took a more positive view of the functionality and goal of private speech and considered it as a cognitive

tool that let the child regulate, plan, and guide behavior [23]. According to Vygotsky, the functional aspect of private speech shows that children can gradually takeover rules by the help of others. This "others" can be parents, teacher, or an experienced person who can help the child to go beyond his current knowledge and experience, which is known as the Zone of Proximal Development (ZPD)[1]. The ZPD is an area beyond the child level of mastery but it is not so cumbersome that he would not be able to complete it without the help of the "others". Within this zone, the role of adults would appear as collaborator, guide, help which is usually known as 'scaffolding'. There are three key factors in Vygotsky theory, namely as culture, language and, the Zone of Proximal Development [5].

Culture Vygotsky believes that construction of knowledge is done through the culture and social environment [5]. In other words, the society, where children belong to, determines the knowledge that children learn about the world and the way this knowledge is learned. Thus, children learn through communication and interaction as well as elements of their own culture including folklores, songs, language, art works, and the like. For instance, a child whogrows up in a society in which homosexual marriage is taboo in the society, takesstrong anti-homosexuality views. This will for sure affect his or her learning, knowledge, and attitude on this issue. In short, Vygotsky asserts that first culture would affect learning, as children learn through interactions, communication and cooperation with others and the environment, and also symbolic representations of the culture such as plays, art works, songs folklores and the like are important in developing child's views[5].Thus, the culture makes a framework in which the child builds meaning.

LanguageVygotskyviews language as the cornerstone of the learning process. He believes that there is a strong relationship between language development and cognitive development. He believes that the language shapes and encodes our world. That is, language is a system through which we communicate, cooperate, and interact and is a cultural tool. He held that there were three stages of language development. Namely, social speech (external speech) up to 3 years, the speech used to control the behavior of others, express simple thoughts, and emotions. Egocentric speech between 3–7 years, children talk to themselves regardless of other individuals who are listening (private speech). They say things aloud to guide their behavior. This inner speech is silent; it is used to direct behavior or thoughts. When this stage is reached, individuals can engage in all types of higher mental functions.

The zone of proximal development the notion that is central in the Vygotsky's theory is the zone of proximal development or ZPD. The idea was that a child functions at any point in time at a certain level of development. However, Vygotsky believed that providing support and guidance by experienced other, a child could develop and go further. The zone of proximal development or ZPD is the distance between what children are capable of doing and the potential level of the child. There is a friction between the actual level, what a child is capable to carry out and is already developed and the ZPD, which, consists of the processes, and function, which, have not been developed yet. A key element in this theory is the role the teacher or experienced other plays. Vygotsky stated that the teacher or the experienced other plays an essential role in helping the child, directing, and suggesting new ideas to them. They are capable of achieving something, which is beyond their own levels of ability. Thus, they move forward from their actual to their potential level.

Vygotsky argued that the earliest speech of child is essentially social. At first, it is global and multifunctional; later its functions become differentiated. At a certain age, the social speech of the child is quite sharply divided into egocentric speech and communicative speech. Egocentric speech, splintered off from general social speech, in time leads to inner speech, which serves both autistic and logical thinking" [6]. He believed that self-direct speech is not sign of cognitive immaturity but a kind of development. It is the time when a child differentiates between communicative talk and self-directed talk. As the child grows old, this self-directed speech is transformed into silent inner speech.

Beyond these two theories over cognitive development and private speech, Kohlberg et al examines these two opposing theories asserted by Piaget and Vygotsky [10]. In his theory, Kohlberg believes that both of these theories have a shared point which is a failure to differentiate the self from an external auditor[24]. Through a series of empirical studies and consistent with Vygotskian framework, Kohlberg et al found that private speech is positively related to mental age at young children and in children with higher intelligence it reaches its peaks [10].In addition, there is a positive correlation between private speech and social participation and it more often occur in circumstances of peers rather that adult presence. Also, it increased during cognitively demanding tasks [24].

DISTINGUISHING BETWEEN SOCIAL AND PRIVATE SPEECH

Child and adult speech utterances are typically classified as either social speech or private speech. Social speech is speech addressed to another person as indicated by either a pronoun reference, a gaze to another person, or other signals of social intent, such as physical contact, argumentation, or conversational turn-taking [16,25]. Private or self-directed speech are those kinds of words usually

children use to talk to themselves as they do their daily activities [26]. While social speech paves the way to communicate with others, private speech provides a means for thinking, communicating with the self, and also for self-regulation of behavior [16]. A typical approach to make distinction between social-private communications is to categorize utterances as social is based on the following characteristics [27-29]:

Eye contact

The child keeps eye contact with someone else during or within 2 seconds of a speech.

Behavioral

The child's conduct incorporates someone else (by physical contact, look direction, and so forth), or someone else's conduct incorporates in 2 seconds of the discussion.

Content markers

The utterance has the same theme as someone else's previous utterance, is a question addressed to someone else, or contains a vocative or someone else's name.

Temporal contiguity

The utterance occurs in less than 2 seconds after any other social utterance.

In spite of the fact that the above methods recognizing social and private discourse are regularly completed for comfort and clarity in the substance of information examinations, it can be contended that recognizing social and private discourse is frequently unhelpful. Among the explanations behind taking such a position are the way that all discourses, including social discourse, has self-administrative capacities, and that youngsters' private discourse is constantly pseudosocial (or 'parasocial')[10] in view of its social starting points and its sharing of etymological elements and auxiliary properties with informative social talk[30].

PRIVATE SPEECH USE AMONG ADULTS

It is obvious that if one averages over numerous young children, a wide range of settings, and various tasks, one understands that preschool-age children are more inclined to show spontaneous, obvious private speech than older ones. However, it is also obvious that private is not just limited to younger children. While engaging in challenging issues and problem solving activities older children [31], as well as adolescents [32], and even adults [33] use overt self-talk. Researchers who examined self-talk among adults also found the same micro genetic patterns of internalization during repetition and increased application of private speech in performing more difficult tasks as well as particular tasks over others [33]. The above observations, application of private speech among children, and the similar relationship available between speech and task difficulty among adults and children have raised the question that what these findings mean for Vygotsky's theoretical notions of developmental course and the particular contribution of private speech in early childhood.

The findings of the research on the role of private speech among young children are consistent with this hypothesis. However, recent data demonstrate that older children as well as adults use private speech periodically in some situations and under some certain tasks. The development strategy show that it is clear that all people use various tools and strategies in cognitive development during problem-solving tasks in which some of these strategies are use more frequently than the others[34].

In addition, a decline of frequency of use of a strategy during completing a task that is probable to occur for a particular activity does not reflect the fact that a strategy or behavior would not be appeared in accomplishing a different task [34-36]. Fernyhough features the phenomenon of private speech among adults as required as "re-externalization" which depends on contextual, personal stresses, or cognitive challenges [37].

SOCIAL ENVIRONMENT AND THE PRIVATE SPEECH

As it seems, private speech is a global and common feature among all children, no matter from what culture they come or what background they have. For instance, some studies and evidences show that developmental disorders including attention deficit/hyperactivity disorder (ADHD) and even specific language impairment put off the internalization of private speech instead of preventing children from using such speech to control their behavior[38, 39]. However, in spite of the fact that the private speech is global, application of it for individuals seems to be different at different ages. Such differences reflect the fact that social environment could have any possible impact on the development of private speech. For

instance, private speech has been discovered to be connected to are liable parenting style] and higher socioeconomic position [24,40, 41]. Conversely, it has been reported that children who were restricted to have social participation and presence put off private speech development. For example, children who grew up in low-income Appalachian families, where the vocal relationship and verbal communication between adults and children are restricted, private speech is delayed as well as among children who have a background of abuse and low-income families [42, 24]. In line with Vygotsky's theory that private speech originates from social communications, these individual differences in private speech have been inferred regarding the differing levels of involvement of social exchanges between adult and child. Vygotsky believes that what makes private speech is the social setting and the environment where the child grows [5]. The high positive correlation between the rates of the social interaction and private speech in children supports this fact.

FUNCTIONS OF PRIVATE SPEECH

The function of private speech refers to the possible consequences of the utterance for the individual's ongoing behavior [16]. For example, the sentence, "I am placing the red pen in my bag", could fall under the functional category Directing own activity or Self-guiding, if it occurs along with the child's behavior [16]. Similarly, if the sentence occurs prior to the action, it could be categorized as Planning. Another example is the sentence, "here is the black pen", which could be categorized as Focusing attention, suggesting that the child is using private speech to concentrate on one particular color of object [16]. Furrow categorizes private speech into 12 functional categories including:

- Instrumental: An utterance that indicates desire or is in the form of a whine; (e.g., "I want it").
- Regulatory: Referring to an imminent future event. The utterance is directing another person's actions; (e.g., "Go there.").
- Self-regulatory: Referring to an imminent future event. The child is directing his/her own actions; ("I put that there.").
- Attentional: Referring to an ongoing sensory event or a sensory event that is eminent; (e.g., "Look").
- Interactional: Talking to someone else or offering a greeting; (e.g., "Hi.").
- Expressive: Describing an internal state or affect, offering an opinion, or expressing a feeling; (e.g., "I love you.").
- Referential: Talking about an object in the immediate surroundings or referring to an event occurring in the present; (e.g., "That.").
- Description of one's own activity: The utterance refers to an event that is ongoing or an event that occurred right before the utterance. The event is one in which the child took part; (e.g., "Putting it.").
- Questions: The syntax of the utterance is in the form of a question or the child's inflection indicates a question; (e.g., "What that?").
- Imaginary: The utterance is sung, a word play or the child labels/describes an object using pretend words; (e.g., "That hat."- referring to a block the child placed on his/her head).
- Informative: Referring to an object or event not in immediate surroundings; (e.g., "Daddy at work.").
- Incomprehensible: Utterances that were inaudible [43].

In addition to the abovementioned functions, other functions proposed for private speech include emotional expression and role play[44]; language practice[45, 46]; practice for communicative encountering[47]; and building up the importance of one's own activities for self [10]. Besides self-regulation, recent research has set a part for private speech in the acquisition of self-knowledge[48, 49]. Rubin, after Mead[50], proposed that remarks on one's activities and emotions "make young speakers aware of their own actions and of their own separate existences"[14]. Swain et al confirmed the useful functions of the private speech in learning language and emphasizes the importance of two ideas of SCT[51]. That is speaking controls cognitive functioning and systematic notions form the appropriate instruction.

Studies show that there is a positive correlation between children's performance on cognitive activities such as planning [21], and puzzle solving [19]. In addition to facilitation of simultaneous cognitive performance, there is a positive correlation between children's involvement in private speech during planning tasks and their engagement in phonological recoding strategies[52] and with the richness that they call autobiographical memories[53]. Moreover, there is a consistency between children's use of private speech and different tasks and contexts [54, 55].

BENEFITS OF PRIVATE SPEECH

Behavioral self-regulation and emotion regulation

Recently conducted researches have shown that there is a connection between children's private speech and behavioral self-regulation in different ways. First, children's private speech has been observed to serve self-regulatory or self-guiding in cognitive problem-solving activities [18]. Second, as the children's task

difficulty and demands for self-regulation increase, the private speech is shown up systematically and automatically [56]. In addition, there is a positive and dynamic relationship between self-talk and children's task performance over time [11,16, 23].

Memory, motivation, communication, and creativity

Private speech is a strategy, which improves memory among children[19]. Private speech has been shown to have a positive impact on working memory, which helps the children to remember the information[6]. As an instance, a child may repeat the words of a story or other things to recall it. For instance, a child might reiterate a rule or story to himself or herself as to recollect it. Children also apply private speech to avail their ability to suppress certain replications or information, and rather use other, less prevalent replications or information, a process called as inhibitory control [6].

Children's motivation is increased by expressing purposes, opinions, and feelings via private speech [6]. For instance, while doing a challenging puzzle or task, a child may talk. Moreover, children were observed to use motivational private speech particularly during a challenging activity, which has a positive impact on the outcome of the activity. Some researchers have shown that private speech would help children to be a better social communicator. By doing so, children understand their own capabilities and practice their communication skills [6]. While playing and doing creative and imaginary tasks, children usually use private speech [19]. The more children use their private speech, the more flexible, creative, and original thought they show [19].

There also seems to be a positive correlation between private speech and working memory, which is also called short-term memory. According to Bradley, working memory paves the way to process the information and make an ephemeral storage for challenging and difficult activities such as comprehension, learning, and reasoning. He elaborates how people "recode materials verbally so as to take advantage of the capacity of the phonological loop for storing serial order" [57].

Private Speech and Problem-Solving

Vygotsky points out that private speech does not simply go with a child's acts but rather goes about as a device utilized by the creating child to encourage cognitive procedures, for example, overcoming hindrances, and upgrading imagination, thinking [5].

Children use private speech frequently amid doing challenging tasks in light of the fact that they are endeavoring to self-regulation by verbally arranging and sorting out their thoughts [58]. The recurrence and contents of private speech are then correlated behavior, execution, and performance. For instance, private speech seems, by all accounts, to be practically correlated with cognitive performance: For instance, activities associated with executive function, problem solving assignments, schoolwork in both languages, and mathematics [59]. Language is likewise being examined in connection to problem solving and has been seen by a few researchers as a key component[60]. They contend that the discoveries of their study are consistent along with the idea that language representations are included in specific types of intelligent problem solving[60]. The significance of private speech becomes possibly the most important factor as the problems turn out to be more difficult, and cannot be comprehended and solved automatically, yet they may be improved by the utilization of private speech to encourage problem solving. Scientists have shown that language is an essential segment for problem solving. Language and cognitive processes are often intertwined [60].

CONCLUSION

The relationship between language and thought has always been the arena of struggle between cognitive psychology, developmental science, as well as philosophy. Two key theorists in this field, whose works have become increasingly influential in years, were Piaget and Vygotsky.

In his book, *The Language and Thought of the Child*, Piaget described observations of children who talked to themselves in classroom environment and speculated as to the developmental significance of what he named at the time "egocentric speech"[4]. Substantially, Piaget considered private speech as poor social speech and at the last stage; it would be replaced by fully mature and effective social speech after the child conquered egocentrism and gained increased cognitive and communicative skills.

On the other hand, Vygotsky proposed that the substantial transformation of the child's cognitive functions initiates toward the completion of the second year of life, when preintellectual language and prelinguistic cognition combined to build verbally mediated thought. Vygotsky claims that inner speech (or verbal thought) roots from linguistic exchanges between the child and others and goes through a transitional stage of self-directed talk before becoming fully internalized. This self-directed speech later was known as private speech [61,62]. This process, private speech, can support children to develop superiority over their

own behavior, and to open a window toward the internalization process that, in Vygotsky's opinion, is central in the formation of higher levels of cognition.

Vygotsky proposed that private speech, rather than originating from within the child's mind and becoming more social over time as envisioned by Piaget, originates from the social world of the child in children's interactions with others. Social speech from parents and caregivers to the child, which functions in part to guide and regulate children's behavior and attention ["other-regulation"], gradually becomes internalized during the toddler and preschool years as the child begins to talk to the self out loud to guide his or her own thinking, behavior, and problem solving. Thus, the social/cultural tool or symbol system of language, first used for interpersonal communication is used by the child overtly not for communication with others but for intrapersonal communication and self-guidance. During this process of internalization or the appropriation of language for the self, a fundamental transformation of the child's cognitive processes takes place when preintellectual language and prelinguistic cognition fuse to create verbally mediated thought. A new level of functional organization of the brain and mind is thus created that allows children to engage in uniquely human, higher order cognitive processes, such as self-reflection and self-regulation of behavior.

This paper attempt to review two theories of the most outstanding psychologists about the relationship between the role and significance of private speech in cognitive development.

CONFLICT OF INTEREST

None

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