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Prospective Memory nurturing the Adolescence

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Abstract- **Daily activities of any human being must be carried out smoothly without any hindrance. To argue, well-being of an individual paves the way for plethora of acheivements in life. To accomplish his routine implementations, he needs the capacity to remember them. This is referred as memory which is one of the major criteria differentiating the humans from wildlife. Out of the various memory types, the prospective memory actually drives anyone to remember the things to be done at the right time. It is probably the essential precursor for an independent life of all and is progressing as one among the newly established field of memory research. Adolescence, being the period of storm and the crucial stage of life, they do need the prospective memory to be groomed as a perfect personality in his society. Thereby, they can execute the tough tasks like decision making, cognitive flexibility and critical thinking. Henceforth this paper aims at developing a few strategies through which prospective memory of adolescence may be improved greatly. Taking the noble profession as teachers and a part of policymakers, they should follow some techniques to enhance the memory of adolescence as the prime responsibility of moulding them as good and useful citizens lies with them.**

Keywords: Memory, Prospective Memory, Adolescence, Cognitive flexibility, Decision making

Startup

Cognition is a mental process not merely a process. It indeed refers the transformation of external and internal inputs and later lose transformed data are stored, recovered and used aptly in the right context. It involves so many functions such as perception, attention, memory coding, retention and recall, decision making, reasoning, problem solving, imaging, planning and executing actions. These abovesaid mental processes utilise the future generation alongwith the varying degrees of their internal representations, which are operating either independently or not, at different stages of processing. Eventhough 'memory' is a single term, it actually infers a multitude of human capacities. "Memory is the means by which we draw on our own past experiences in order to use this information in the present" (Sternberg, 2012). It is the name implying the structures and processes of storage and subsequent retrieval of information.

Sequence of Memory

Specifically, the three stages of memory encoding, storing and retrieval (Brown & Craik, 2000) are strictly sequential in nature and interpret the processes of memory. The sensory data is converted into a mental representation in the encoding stage. In the second stage, the encoded information is stored in memory. The final stage of memory involves the use of stored memory. The levels of processing framework postulate that memory varies along a continuous dimension in terms of depth of encoding inspite of its layers (Craik & Lockhart, 1972). There are no distinct boundaries between one level and the next. The processing style of the storage plays the main role here in this framework. The level at which the information stored will depend, in large part, on how it is encoded. Moreover, the deeper the level of processing, the higher is the probability for an item retrieval in the course of their retention (Craik & Brown, 2000).

Memory and its spectrum

Different types of memory can be put forward as a model which is called as the modal or multi-store or Atkinson-Shiffrin model, ranging from short-term to long-term memory including the sensory stage. This model still remains as the most popular model for understanding memory.

Sensory memory, an ultra-short-term memory with the ability to retain impressions of sensory information soon after the decay of original stimuli, is a buffer to receive the stimuli from the five senses of sight, hearing, smell, taste and touch and they are retained accurately and briefly for our convenient recalling of memory. This ultra-short-term memory decays or degrades very quickly and exists there for less than one second after the perception of an item. Following, the information is moved on from sensory memory into short-term memory. Also it can remember only a small list of random items, that too, satisfying the condition of non repetitions and no reinforcements which shows their limited capacity. The other stage 'long-term memory' is intended for storing the information over a long period of time. Despite the forgetting impressions, it actually can hoard unlimited amount of information almost indefinitely. Short-term memories can be changed as long-term memory with the process of consolidation. Consolidation consists of the association of many steps besides the meaningful association and rehearsal.

The other terminologies in memory are explicit or declarative memory which means the memory of facts and events. These memories can be consciously recalled or "declared"as the information is explicitly stored and retrieved. Declarative memory has its dividends as episodic memory and semantic memory. Episodic memory represents the memory of various experiences and specific events in life. It may be

autobiographical events connected with time, places, associated emotions and other contextual knowledge, that can be explicitly stated. Semantic memory, on the other hand, hints the factual knowledge shared with others and independent of personal experiences. Mostly this memory relates many fields making it, as abstract, along with this relational nature. Semantic memory is the subset of episodic memory whereas episodic memory supports and underpins semantic memory by reducing the links making the information generalised. Both have the common encoding process. At the same time, another memory is the unconscious memory of skills referred as the implicit or procedural memory. Automatic sensory-motor behaviours are embedded in these memories and are typically acquired through repetitions of the actions again and again.

Prospective Memory

Our minds have two constantly working types of memory - retrospective and prospective memory. Retrospective memory is the past memories of events associated with our lives while prospective memory concentrates on recalling information that we were supposed to remember as well as knowing we are supposed to perform some sort of action in the future. Prospective memory is another way of describing our ability to do something later on whereas retrospective memory involving the things to be remembered that happened earlier in the passage of time. Both prospective memory and retrospective memory enclose attributes of other types of memory too, like, semantic and episodic memory.

"Prospective memory (PM) is commonly defined as the set of abilities that are used when remembering to perform an intended action, or thought, at some future point" (Brandimonte, Einstein, & McDaniel, 1996). Future remembrance of the content also mean the prospective memory,in other words, "remembering to remember" or remembering to perform an intended action. It may be either

•Event-based PM pinpoints the way of remembering to perform certain actions at specific circumstances. In event-based prospective memory, the environment serves as an external cue to prompt the intention formed earlier. Event-based tasks provide external cues that may prompt retrieval of the intended action during the delayed-performance interval.

•Time-based PM involves the recall of the remembrance to perform an action at a particular time. In time-based PM, an intention is executed either at a predetermined time or after an elapse of specific period of time.

The main distinction between these two types of tasks is that time-based PM is more self-initiated whereas event-based PM is more environmentally cued (Block & Zakay, 2006).

Less studied forms of prospective memory are habitual prospective memory (Meacham & Leiman, 1975), and activity-based prospective memory (Kvavilashvili & Ellis, 1996). In habitual prospective memory tasks, the action is performed repeatedly in a routine manner. But the activity-based prospective memory, on the other hand, requires the intention to be retrieved and executed upon completing some other task.

Cognitive processes underlying the prospective memory

The intended act cannot be performed immediately after the intention has been formed. Here an intention is formed, and then during encoding, it is stored in the retrospective memory. Later, at the moment of execution, intended action is retrieved. Thus, in addition to retrospective memory, many other executive functions like planning, monitoring for the prospective memory cue, inhibition and task switching play a critical role in the PM process (Schnitzspahn, Stahl, Zeintl, Kaller, & Kliegel, 2013). During the formation of an intention, an associative link is formed between the intention and the associated action related to this intention. The intention called the "retrieval context" is to be performed in a particular circumstance (Ellis, Kvavilashvili, & Milne, 1999). This is represented by an external cue in a particular time or in certain duration. The delay period between creating the intention and the appropriate time to act (i.e., the retention interval) is filled with an accomplishment called the ongoing activity (Ellis et al., 1999). It was found out by McDaniel, Robinson-Riegler, and Einstein (1998) that an environment can trigger the retrieval of associated memories, which is described as an 'automatic-associative' memory system.

Eminence of Prospective Memory

PM is vital for everyday life and has been in focus during the recent years. It is critically important for developing the sense of independence in adolescence and young adulthood. Prospective remembering consists of multiple phases that rely on different cognitive processes (Ellis, 1996). Many researches are underway in this field of study where this memory is correlated with the other cognitive dimensions. Comparing with the typically studied retrospective memory tasks, prospective memory finds its deviation quickly. A person remembers to perform an intended action without an external request to search memory to self initiate the prospective memory tasks. Attention influences the successful performance of prospective memory tasks as evidenced by findings given by a few investigators. Prospective memory performances are given this much special importance as they have impact on cognition abilities, the personality depends on. In addition, time – based and event-based prospective memory seems to rely on different executive processes leading the individuals to earn the reputation and self-esteem. Prospective memory is always regarded as successful and can be described as the process supporting the recognition of delayed intentions and their associated actions. As such, it is intimately associated with the control and coordination of future actions and activities. This ability is critical to competent human functioning, so much so that previous studies have suggested that PM problems are the most frequent memory failures in everyday life (Kliegel & Martin, 2003).

PM of Adolescence

The World Health Organization (WHO) defines an adolescent as any person between ages 10 and 19. Adolescence

encompasses psychological, social, and moral terrain also besides the physical aspects of maturation. In general, the term 'adolescence' typically refers to the period of age between 12 and 20 and is roughly equivalent to the word 'teens'. Youth experience the difficulties of behaving due to their phases of numerous physical and social changes. Ultimately acting on those desires impel them to pursue the structure of an apt earning and living tied up with a family. From a biological perspective, adolescence should be the best time of life. Most physical and mental functions, such as speed, strength, reaction time, and memory, are more fully developed during the teenage years. Also in adolescence, new, radical, and divergent ideas can have profound impacts on the imagination. They may be perceived as conscientious and well organized fellow in the surrounding society. Accordingly, there is evidence that—similar to PM development—future thinking continues to increase from childhood to adolescence (Gott & Lah, 2014). There is evidence that the ability of adolescents to engage in future-oriented cognitions (Gott & Lah, 2014) and the related underlying brain areas (Blakemore & Choudhury, 2006) are still developing.

PM enables the adolescence to shape and direct the cognitive resources in the pursuit of future plans and actions. Also, it is essential for the regulation of cognitive skills that underlie our ability to complete many real-world activities. Therefore it is accepted as the central focus in the formation of future plans and actions. Developmental improvements in PM performance have mainly been attributed to the parallel development of executive functions (Altgassen, Vetter, Phillips, Akgün, & Kliegel, 2014). In daily life activities, PM is important as it structures the valuable time in an economic way and to lead an autonomous life. As a factor, it affects the dignity in different domains revealing the human's inability at some instances. Even though more than one intention is to be considered, one intention is more important than another one. Accordingly, that more important intention is more likely to be remembered.

Improving the PM

PM depends on several cognitive processes, including planning, attention, and task management. The school management should insist a few things to prosper the life of adolescence like

•Meditation is one thing to try to strengthen the PM. Meditation, with its power to has been shown to improve PM by enhancing the concentration.

•Regular exercise also will improve this memory to a greater extend. In particular, a simple walk daily finds its result in our memory performances. Regularity must be maintained to ensure the good health and mental sharpness.

•Every teacher should make students to be active readers as reading is a good habit inculcating their remembrance.

•Also teachers should help students develop cues when storing information. Mnemonics assists the adolescence to keep up their prospective memory.

•Storytelling favours the persistence of prospective memory which specifically activates the brain during the learning process as well.

•Humour, laughter, and joyfulness release important brain chemicals that make us feel good and aid in retention.

•Learning through play is one of the most powerful ways to learn. Repetition aids in storing memory, and the fun will help the brain mark the connections for later memory encoding.

•The multiprocess theory predicts that good planning at encoding will prompt spontaneous retrieval processes during PM performance (McDaniel & Einstein, 2000).

•Future thinking did indeed lead to deeper memory encoding and stronger cue–context association further making to be beneficial for the prospective memory of the adolescents. They must instruct them properly by emphasising the significance of the future thinking in which the task attractiveness is created and enforced to proceed further.

•Providing the wards with some rewards too raises their prospective memory. Basically rewards are the fruits of correct retrieval at the right time.

•Encouraging them to do the executive functions during the learning process itself and this inserts a feeling of independency in them.

CONCLUSION

Education and educators do precise things in the life of individuals. Learning shapes them a lot to be adjustable and also helps them to gather enough knowledge by way of assimilating the heap of information they collect every now and then. People become adept, utilising the sources thereby gaining both concrete and abstract ideas of any concept associated with our survival arena. The underlying requirement to be a normal human being, one among the lot, is the memory, especially prospective memory. Prospective memory gets developed in adolescence, which, in turn, is the basis, for making them to do the executive functions, henceforth witnessing their potentials. Their memory power can be geared up by their mentors as they are in the phase of school-going. Teachers should emphasise the importance of prospective memory besides giving proper training and practise to improve it. School is the miniature society as well as the second home. Sure it must indulge the pupils to be active, helpful and competent in this phase of tough survival. The assignment must be corroborated to create the good citizens for future generations to come. Not only psychomotor and aesthetic domains to be initiated within the learners, cognitive domain also must be made efficient to become scholars or elite personalities.

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