Piaget Theory Vs Information Processing Theory Essay, Research Paper

Abstract

Reasons behind why children think in different ways have been established in various theories. Jean Piaget advanced a greatly influential theory that reflected his prior studies in the fields of biology and genetic epistemology. It is a theory that has been contended by many others, including that of the information-processing approach to cognitive development. It will be shown where these theories compare and where they contrast, in conclusion explaining why Mary’s children think differently.

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Introduction

The cognitive abilities of children have long been an issue for developmental psychologists. The development of a child’s mental processes, such as thinking, remembering, learning and using language, has been interpreted by many psychologists and explained in a number of theories. Of these theories Jean Piaget’s cognitive developmental theory has been a major influential model since its origination in the 1920s (Beard, 1969 ). Piaget’s theory has a biological perspective to cognitive development and focuses on broad, qualitative stages. Another acknowledged theory is the information- processing theory which, approaches cognitive development from a computer accentuated perspective, and focuses on the more narrow, continuous, quantitative changes (Westen, 1996).

Though these theories approach cognitive development from different angles, their advancements into how a child constructs thought and thinks are not totally at odds with one another as they similarly compare in some aspects.

This essay will discuss how these two theories compare and contrast, and in conclusion elucidate why Mary’s seven-year-old son sometimes thinks very differently to his three-year-old brother.

Body of Evidence

The Piagetian theory of cognitive development emphasises the relationship between biological and physiological functioning (Hughes and Noppe, 1990) and the individual and the environment. Piaget developed his theory following observations conducted with children of varying ages that deduced that children of different age groups gave consistently different answers from children in other age groups (Beard, 1969). The reasoning behind these answers seemed to have more significance then the actual answers as Piaget asserted that these responses reflected the variance in children’s thinking, thus suggesting cognitive development occurred in a stage-like process (Matlin, 1983).

Preceding the commencement of the four identified stages, Piaget stated that there is a process that can be described as ‘coming to know’ (Tuddenham, 1972) , this acquisition of cognitive abilities are then gradually accumulated throughout the stages.

The process of ‘coming to know’ commences with the infant’s innate reflexes and their innate tendency to exercise them in certain situations (Beard, 1969). These reflexes are simplistic schemes, which Piaget referred to as an organised, repeatedly exercised pattern of thought or behaviour (Westen 1996). Schemas being the earliest forms of mental activity a young infant develops (Matlin 1983), gradually increase in quantity and advance in complexity with maturation, thus enabling thinking and behaviours to a more complex degree (Wilkes, 1997 ). In order for schemas to develop, two processes are constantly utilised to maintain what Piaget is asserted is the driving force behind cognitive development, equilibrium (Westen, 1996). Assimilation and accommodation are used simultaneously and alternately throughout development allowing adaptation and organisation and thus, equilibration (Wilkes, 1997).

Once these cognitive abilities are acquired, Piaget suggested that they gradually develop through four qualitatively different stages that proceed successively. Although they occur in an exact sequence, they are not strictly determined by age Each stage equips the child with distinct logic capabilities that are requisites for the next stage of thinking (Deiner, 1996).

The sensorimotor stage extends from birth to age two, a period that sees the beginning of physical development. While this development enables increasing physical interaction with the environment, the child’s knowledge is constrained by their sensations and actions. As a result, concepts about reality are limited and thinking is eminently egocentric (Westen, 1996). Recognition that the world has an existence independent of psychological contact actualises with the procurement of object permanence, an achievement alongside another accomplishment, that of intentional action (cause and effect) (Deiner, 1996). Succeeding this stage is the preoperational stage, commencing at around age two and lasting to about ages five to seven (Westen, 1996). Primary advancements in this stage include the development of symbolic thought (Hughes et.al 1991); the development of language, which establishes a dramatic change in the child’s intellectual functioning; the development of memory and imagination and emergence of logical thought. However, despite these advancements, thinking is still executed in a irreversible manner and egocentric thinking predominates along with the tendency to focus on only one aspect of an object at one time (centration), (Deiner, 1996).

Upon completion of this stage, follows the concrete operational stage, extending from ages roughly seven to twelve (Westen, 1996). Concrete operational thought allows logical reasoning about objects or situations that are either directly perceived or imagined (Applied Psyc., 1999) . Some concepts of conservation and transivity begin to be understood and egocentric thought to begins to diminish (Hughes et.al 1991 and Beard, 1969 )

Marking the fourth (formal operational) stage is the ability to think abstractly through the logical use of symbols Although this stage roughly extends from adolescence to adulthood, many people do not think formally as an adult (Westen 1996).

In comparison, the information-processing theory (IPT) holds thinking as an analogy and is predicated to both computer and communication sciences. The IPT assert that both systems accept external information, operate on it in various ways and deliver a response (Bourne, Ekstrand and Dominovski, 1971). In humans, once a person has received information, it is processed in a sequence of stages, with each stage performing a specified function, transmitting it to another stage, eventually creating a response or storing it. (Matlin 1983)

From the IPT perspective, cognitive development is distinguished by the component processes involved in thinking (attention, sensory registration, memory, encoding and retrieval) and their influencing factors (knowledge base, memory use and capacity, automatisation, cognitive strategies and megacognition). The IPT focuses on how and what executes cognition and the proficiency at which this is done. As the cognitive abilities that formulate and accelerate thinking vary with development, the IPT also observes how thinking is influenced by age.

Atkinson and Shiffren advanced a model of memory known as the information-processing model (Matlin, 1983). This model consists of three memory stores: sensory; short-term and long-term storage. Information enters the processing operation the information through the screening mechanism known as attention. Although this process is initially unrefined, it increasingly becomes more selective throughout development, allowing only relevant information to penetrate into the sensory registration which very briefly retains the information in either the iconic memory (visual), echoic memory (auditory) and tactile memory (touch). From here, the information is transmitted to the short-term storage that holds the information actively being used or worked on to eventually reaching long-term storage, where information can be stored more permanently for later retrieval.

One influential, developmental factor in this overall process is that of the knowledge base. Although age and exposure to different experiences sustain this accumulation of information, age is not necessarily a determinant in the efficiency of the cognitive abilities (Chi 1978, cited in Westen 1996). The expansion of the knowledge base and capacity of the memory enable the use of strategies or learned techniques to aid memory, thus cognitive development implements greater recall of information from memory storage (Matlin, 1983).

A subsequent influential factor is automatisation. Automatisation occurs when activities become refined by experience becoming automatic, effortless and proficient to execute, allowing individuals to handle multiple information and situations simultaneously. (Westen 1996),

Another primary aspect of cognitive development megacognition, the process of thinking about thinking and modifying cognitive processes (Hughes et.al, 1991 and Westen, 1996)). Through actively monitoring and regulating cognitive processes, research studies have shown that megacognition explains why children of different ages deal with learning tasks in different ways( Duell 1986).

Discussion

In these two theories, explanations to why children of different ages think differently from one another have been advanced. Although in some aspects they establish a unified approach, in that children progress throughout life, acquiring mechanisms that broaden a their way of thinking, Piaget’s theory therewith differs from the IPT approach.

Piaget asserts children develop in a sequence of hierarchical stages and observes changes qualitatively. Piaget’s theory also disregards socio-cultural variables, allowing for minimal individual differences The IPT views development as a continuous transition, with observable quantitative changes, allowing for individual differences (Flavell, 1994).

Piaget’s theory explains the differences between Mary’s 7 year-old son and his 3-year-old brother as being in either different stages or in the same stage but at different levels. As the Piagetian theory is structured, based on qualitative stages and accordingly linked to a particular age range and no further description of the children has been given, the stage that the siblings are categorised as being in have a tendency to be ambivalent. However, the younger child would likely to be emerging into the pre-operational stage, his thinking superior to when he was in the sensorimotor stage, but still extremely egocentric, centrated and immature (Deiner, 1996). This factor explains that also explains that both siblings can still be considered pre-operational but variance in their thinking accounted for by the fact his 7-year-old brother is either nearing the end of the preoperational stage, his thinking more mature and less egocentric and centrated. The older child could also be commencing the concrete operational stage, where his thinking would be beginning to be logic and consequently different from his younger sibling..

In comparison, the IPT elucidation of Mary’s observation would describe the children’s variance in thinking, as a result of a contrasting level of proficiency in her children’s cognition. The difference of four years would account for greater speed and efficiency in processing and also, that through development, cognitive components had advanced to a greater degree in the older child. This could result in him more likely to have greater selective attention, memory capacity and utilisation, to demonstrate more awareness of his thinking process, and thus explaining why he thinks differently from his three year-old sibling.

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