Children’s Cognitive Development: Case Study Of Daniel, Aged 5

Daniel, aged 5.

According to Piaget cognitive development is a process, with knowledge constructed within the minds of individuals. Piaget’s Theory is based on 4 stages of cognitive development, defined by qualitative measures (Bergin, Bergin, Walker, Daniel, Fenton & Subban 2018). He determined that whilst each child goes through the stages in the same order, each stage could be reached at an earlier or later age than what he has approximated. As children move through each stage their cognitive ability improves (Bergin et. al 2018).

The first stage of Piaget’s theory is the sensorimotor stage. Piaget estimated children aged 0 to 2 operate in this stage. Cognitive growth begins in this stage. The second stage children progress to is the preoperational stage. Children aged 2 – 7 are generally found to be operating in this stage and are not yet capable of logical thought. Piaget believed that children in this stage had additional cognitive deficits such as animism, egocentrism, lack of conservation and lack of hierarchical classification. The third stage of cognitive development is the concrete operational stage. In this stage, children aged 7 to 11 are progressively capable of more logical, rational thoughts. The cognitive deficits of the preoperational stage are slowly lost, making way for more logical thought processes based on concrete evidence. The final stage of Piaget’s theory is the formal operation stage. Piaget suggests that children progress to this stage at approximately 12 years old or older. Children or adolescents operating in this stage are more capable of using abstract thought to solve problems (Bergin et. al 2018, Hanfstingl, Benke & Zhang 2019).

Daniel, a five year old child, was asked to complete several tasks. Using Piaget’s Theory, these tasks assist in identifying the stage of cognitive development he is operating in. Each task is designed to test a skill and or aspect of Piaget’s Theory. The videos used were provided on the subject interact page.

Task one:

Task 1 involved Daniel being asked to draw 2 trees on either side of a mountain that had been drawn for him. This task is designed to test centration and or decentration. Centration is defined as ‘focusing on one aspect of a task to the exclusion of other tasks’ (Bergin et. al 2018, p. 108). Decentration is the opposite of centration, the ability to focus on multiple aspects of a task (Berk 2013, p. 245). Children operating in the pre operational development stage would generally draw the trees at a right angle to the mountain, centrating on the side or slope of the hill rather than considering the ground level. Daniel’s drawing has the trees drawn vertically from each side of the mountain, suggesting that he can decentre. Centration is a limiting factor in the pre operational development stage. From his response, Daniel appears to be operating in the concrete operational stage of development.

Task two:

In task 2 Daniel’s mum places a ball of playdough into her right hand and a stick into her left. She then asks Daniel what hand the playdough is in. He answers right. Daniel’s mum then places the playdough in Daniel’s left hand and the stick in his right and asks the same question, what hand is the playdough in. Daniel answer’s with right. When asked which hand he writes with Daniel lifts his right hand with the stick in it but can’t explain why that is his right hand. This task is designed to test spatial reasoning. Piaget suggests that pre operational children are unable to perform mental rotation (Berk 2013). The class notes on skills used in Piaget’s theory places children that can put themselves in someone else’s perspective mentally in the concrete operational development stage. Daniel’s answer suggests that he has not yet mastered mental rotation and therefore is still operating in the pre operational stage.

Task three:

In task 3, Daniel is asked to place several sticks in order according to their length. This task is designed to test Daniel’s seriation skills. Seriation is the ‘ability to sort objects according to any characteristic’, in this case, length (Bergin et. al 2018). Piaget determined that children operating in the concrete operational stage of development can apply logic more readily and can seriate (Bergin et. al 2018, Berk 2013). Daniel quite easily arranges the sticks in order, showing Daniel has mastered the skill of seriation and therefore would be operating in the concrete operational development stage. According to Piaget, children do not reach the concrete operational development stage until around age 7, however Daniel is clearly able to apply seriation skills to tasks, despite being much younger than Piaget’s predicted age range (Bergin et. al 2018).

Task four:

In task 4, Daniel is asked who is taller out of Harry, Greg and John. Daniel’s mum tells him Harry is taller than Greg, but Greg is taller than John. This task is designed to test transitive inference, ‘that is the ability to seriate mentally’ (Berk 2013 p. 250). Children and or adolescents operating in the concrete operational development stage should be capable of seriating mentally (Bergin et. al 2018, Berk 2013). Daniel successfully answers that Harry is the tallest. When asked why, he is unable to elaborate further than ‘because he is’, suggesting that whilst he can apply transitive inference correctly, he is unable to apply hypothetico-deductive reasoning to answer the question. Daniel’s answer places him in the concrete operational stage of cognitive development.

Task five:

In task 5c, Daniel is presented with two lines of 6 chocolates. He is asked if there are the same number in each row, he replies that there are. One row is then moved slightly to the right and spread out. He is asked again if there are the same number in each row. He replies with yes. This task is designed to test conservation, specifically conservation of number. Piaget suggests that children operating in the concrete operational stage of development should be able to successfully conserve number. Daniel easily answers the question posed to him, showing that he has the ability to conserve and therefore would be operating in the concrete operational stage of development (Bergin et. al 2013).

Task 6:

In task 6 Daniel is asked why leaves turn yellow and red in autumn. His initial response is because it is autumn time. When asked what does that mean, he answers with ‘because they are burnt’. This task is designed to test Daniel’s ability to use hypothetico-deductive reasoning. The class notes on skills in Piaget’s theory state that ‘hypothetico-deductive reasoning is the ability to form hypotheses and answer complex problems’. Children operating in the concrete operational stage, whilst capable of logical thought and reasoning, still rely on real world experiences to determine their thinking. As children progress into the formal operations stage, they are better able to think abstractly and apply logic without having firsthand experience previously (Berk 2013, Bergin et al 2018). Daniel’s answer suggests that he is relating the leaves turning red in autumn to his personal experience that objects that are red usually mean they are burnt. Daniel’s answer suggests that he is not yet capable of applying abstract thoughts in order to develop hypotheses and answer complex problems, suggesting he has not yet progressed to the formal operations stage but remains in the concrete operations stage.

Discussion:

If Piaget’s Theory is followed, it could be assumed that Daniel should be operating in the pre operational development stage as he falls within the approximate ages given. However, Piaget’s Theory wasn’t based solely on age. Piaget believed that not all children moved through the stages at the same rate and therefore some children could progress at a younger or older age compared to other children (Bergin et. al 2018, Hanfstingl, Benke & Zhang 2019). From the evidence provided in these tasks, it would be more appropriate to say that Daniel is operating in the concrete operational stage. Daniel shows signs of organised, logical and rational thinking in most of the tasks he was asked to complete, all characteristics of the concrete operational development stage (Bergin et. al 2018, Hanfstingl, Benke & Zhang 2019). 3 tasks tested skills necessary for the formal operations development stage. In task 2, 4 and 6, whilst he could correctly answer the questions posed to him, he was unable to form a hypothesis as to why this occurred when asked. It is clear from these answers that Daniel has not yet progressed into the formal operation development stage.

References:

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