

Jean Piaget and His Studies on Cognitive Development and Contributions to the Field of Psychology

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ABSTRACT

This paper explores the life, accomplishments, and psychological contributions of Jean Piaget and how his findings impacted the field of psychology. It also dives into the criticisms he faced for his findings. Piaget was born as the son of a historian but decided to study abnormal psychology after being introduced to the concept of psychoanalysis. Piaget went on to study children and cognitive growth at different stages of childhood. He developed four stages of mental growth and explored what children can do during each stage. Piaget studied other concepts, such as object permanence and conservation of quantity, and explored the level of understanding of these concepts during each stage. This paper dissects many of the topics Piaget studied and analyzes criticisms against his work, raising the question of how he could have studied these topics better. It also emphasizes how Jean Piaget revolutionized the field of psychology through his discoveries and contributions relating to children and how they learn, demonstrating how Piaget's theories can even be used during the 21st century to understand cognitive growth among children.

Methods

This paper started as an assignment for my Honors Psychology class. I read about Jean Piaget and wrote a short paper, and I made a presentation about his life, interests, and studies. This project, however, was unlike any other. It initially sparked my interest, so I dove deeper into the topic. I used articles from encyclopedias, publications, and journals to explore his contributions and learn more about his four stages of mental growth. I was immediately captivated by what I learned, so I analyzed specific concepts he studied and found. I was particularly intrigued by his study on the conservation of quantity and an experiment he conducted using red and blue chips to test their understanding of mathematical concepts at different ages. I then went on to study some of the criticisms Piaget faced and how that affected the accuracy and relevance of his theories. After conducting this research, I used the information I found and my analysis of the impact and relevance of his studies, and I compiled it into this paper.

Jean Piaget's Life and Interests

Jean Piaget, born on August 9, 1896, in Switzerland, was the son of a historian. At the young age of eleven, he published his notes on a rare type of sparrow. He then went to study natural science and researched mollusks. Piaget was later introduced to psychoanalysis, leading him to study abnormal psychology. Around 1921, he held a high position at the Jean Jacques Rousseau Institute and was a professor of the history of scientific thought. In 1956, "[Piaget] founded and became director of the Institute for Educational Science in Geneva," which demonstrates his success in the field of psychology ("Jean Piaget." Encyclopedia of World Biography Online). After coming up with his ideas of cognitive development in children, Piaget had the opportunity of having his ideas introduced to the United States

by Harvard psychologist Jerome Bruner right around 1957 when Piaget's books were being translated into English. Piaget received honorary degrees from Oxford and Harvard Universities. He made many appearances at different conferences concerning childhood development. In general, Piaget preferred to stay out of the spotlight. He had a quiet life that helped him develop his theories further. Piaget woke up at four every morning and wrote at least four publishable pages before leaving to attend meetings or teach classes. During lunch, he would take walks while pondering his interests. He explained that he always liked to think about a problem before reading about it. Every summer, Piaget would vacation in the Alpine Mountains, writing extensively about his developed theories and thoughts relating to his studies ("Jean Piaget." Encyclopedia of World Biography Online). He made significant contributions to the field of psychology and conducted countless experiments that helped him prove his findings.

Piaget's Four Stages of Mental Growth

The most significant part of Piaget's work was the creation of the four stages of mental growth that he found in children, particularly in his own.

Sensory-Motor Stage

The first stage is the sensory-motor stage from birth to age two. In that stage, the mental structures concentrate on concrete objects ("Jean Piaget." Encyclopedia of World Biography Online). During this stage, children are concerned with mastering their innate physical reflexes and using those to do exciting actions. Children also become more aware of themselves as entities. They realize that there are objects around them that also have a separate existence (Britannica). When a child acknowledges their existence, that is known as "self-recognition," and when they acknowledge the existence of other things or beings, that is referred to as "object permanence" (McLeod).

Pre-Operational Stage

The next stage that Piaget discovered is the pre-operational stage, from age two to seven, when children learn symbols in language, fantasy, play, and dreams ("Jean Piaget." Encyclopedia of World Biography Online). Children also learn to manipulate their environment symbolically through representations or thoughts about the outside world in this stage. Furthermore, they learn to use words to represent thoughts, feelings, and objects (Britannica). The children are more egocentric since they assume everyone sees the world as they do. They also know how to classify objects and start to believe that non-living items also have life and feel like a person does, and that concept is referred to as animism (McLeod).

Concrete Operational Stage

The following stage is the concrete operational stage, in kids seven to 11, when they master classification, relationships, numbers, and ways of reasoning about them ("Jean Piaget." Encyclopedia of World Biography Online). During this stage, logic and thought processes advance. Children start to learn about classifying objects and comparing similarities and differences. They can also start understanding the concepts of time and numbers (Britannica). Children can logically conclude and have realizations. They can understand that some properties of an object may change, but some of the other properties could still stay the same. They also learn to visualize and mentally illustrate their imaginative thoughts. The children also become less egocentric and start thinking about how others might feel (McLeod).

Formal Operational Stage

The final stage is a formal operational stage, from age eleven onward. During this period, the children master independent thought and other people's thinking ("Jean Piaget." Encyclopedia of World Biography Online). This stage extends into adulthood. They should now be able to think orderly and logically. Their mental experimentation should be more flexible. In this stage, the adolescents should be able to manipulate abstract ideas and make implications of their thinking and others' (Britannica). Adolescents should not need examples to deal with abstract ideas and follow the form of an argument. They should also be able to come up with solutions to theoretical problems (McLeod).

Piaget's Observations on Cognitive Growth in Children Versus Adults

Piaget discovered that children's mental growth stages differ from those of adults, especially in the first three steps. Concepts and observations in children's first three stages of mental growth are based on actively exploring the environment instead of language and communication. During these stages of development, children can learn naturally without requiring punishment or reward. Piaget also explained that children's connections and thoughts about nature were not inherited or learned but built from their mental structures and experiences. He found that children learn higher-level ideas and concepts by learning lower-level ideas and developing more detailed and accurate explanations. Similar problems are attacked and explained at higher levels to develop reasoning skills ("Jean Piaget." Encyclopedia of World Biography Online).

Piaget created and conducted reading tests with children to observe the types of errors they made. He then went to explore the reasoning process in those children. Piaget explained that children consistently achieved mental growth by integrating smaller-level concepts into higher levels of understanding. He said children did that by building and adding to those concepts. The developmental stages developed by Piaget caused children to reevaluate their older ideas of learning and education. The development of thought processes was not genetically inherited, so simple reinforcement would not be enough, and mental development would have to be at the proper stage. That increased the importance of a teacher since not only did they give knowledge to their students, but they also guided children into their discovery of the world. Piaget reached some of his conclusions about child development through observations and conversations with his children and others. He asked the children questions about simple problems he created and analyzed their incorrect responses to depict their worldview (Britannica).

Piaget's Study on Children's Understanding of Conservation of Quantity

Piaget conducted countless experiments on children to create and develop his discoveries. One specific experiment that he conducted was about how children form mathematical concepts. In a research paper that he wrote, Piaget explained that "a child five to six...has not yet grasped the essential idea of number: namely, that the number of objects in a group remains the same, is 'conserved,' no matter how they are shuffled or arranged. On the other hand, a child of six or seven and a half...will realize that the two groups remain equal in number regardless of the shape they take" (Piaget). Piaget tested that theory by laying down a set of eight red chips, each spaced one inch apart. He asked the children to take out an equal number of blue chips. He proposed that their reaction would depend on their age. As expected, children of age five or younger put the blue chips close together so that the length of the blue chips together matched the length of the red chips spaced apart. They believed the number was the same if the row length was the same. Children at age six laid out the blue chips opposite each red chip, matching the correct number, but they did not quite understand the concept. They believed that if the chips in one row were pushed together, there would be fewer chips. Children at six and a half or seven years old achieved the third stage and correctly matched the chips together while understanding that the arrangement of the chips does not affect the amount present.

Conservation of quantity was a logical concept later examined by mathematicians and logicians (Piaget). Piaget used the data from that experiment to explain that children had to understand the idea of the conservation of quantity before developing the concept of a number. They had to realize and acknowledge that moving anything around does not change the amount of that item. Piaget spent much time conducting experiments on children to discover new theories about them. That made his contributions to psychology much greater since other psychologists and scientists conducted similar experiments to build on Piaget's findings.

Criticisms Against Jean Piaget and His Methods

Even with all his work with psychology, Piaget faced much criticism, especially with his theory of cognitive development and children's four stages of mental growth. Nonetheless, Piaget has made outstanding contributions to the field of cognitive development as well as psychology in general.

Most criticisms against Piaget's work were regarding the final stage of his four proposed stages of cognitive development in children. Some psychologists argue that Piaget's final stage of development, which begins around age 11, claims what children can do. However, some of that is beyond adults' comprehension and is impractical to generalize for children at age eleven. Upon hearing about this, Piaget agreed they would only be able to reach this high level of knowledge and thinking with specific areas of expertise. Other critics of Piaget's work pointed out that the final stage also lacks any mention or connection related to emotion. Piaget responded to that criticism by explaining that emotion is just a motive for actions, but knowledge is not based on it. He had little interest in studying motive and individual differences, even though human characteristics are crucial when it comes to motivations for acquiring knowledge. Critics also thought that the thinking and mental development mentioned in the last stage of development surpassed the intellectual development of many adults. He set the expectation higher than it should be, making that stage unrealistic.

Another point that challenged Piaget's perspectives was that "he gave little or no credit to the influence of adults and to how children learn from their parents, teachers, and others" ("Jean Piaget." New World Encyclopedia). He prioritized his research on acknowledging the importance of a child as a big part of the development of their knowledge ("Jean Piaget." New World Encyclopedia). A critic from Massey University also pointed out that Piaget never used an operational definition in his writing. That made it easier to misinterpret his work and impossible for any other researcher to establish further connections based on Piaget's research. They also mentioned that Piaget had a confounding variable that he should have considered. All the children that Piaget studied in his experiment grew up in Geneva, a Western culture. Students were explicitly taught, trained, and influenced to think in a specific way ("Criticisms of Piaget's Theory.").

Impact on the Field of Psychology

Despite his criticism, Piaget made a far-reaching impact on his studies. He discovered much about cognitive development and how different age groups behave differently. Around 1921, Piaget published his findings. He wrote over fifty books and monographs in his extensive career. Piaget continued to develop his discovered theme that a child's mind evolves through a series of set stages to adulthood (Britannica). Piaget conducted experiments with revolutionary methods. His methods are favored much more than other psychologists ("Jean Piaget." Encyclopedia of World Biography Online). Other behavioral psychologists studied animal learning, but he conducted experiments on children and derived definable stages of children's concept change and maturity. This research made a significant impact on the psychological scientific community. Piaget's theories also developed over the years. He continued conducting experiments, causing his explanations to develop and be more detailed, but his beliefs and theories remained the same.

Though Piaget had a few gaps in his theories and findings, his discoveries transformed the study of cognitive development. They helped other scientists and psychologists learn more about children and how their brain grows. Overall, Piaget's findings and theories helped revolutionize the world's view on children and how they learn.

Conclusion

Jean Piaget was a dedicated psychologist. He committed his life to studying children and how they learn. His four stages of cognitive development and mental growth made a big difference in his field. He made the field of cognitive development in children and psychology in general much more advanced. Piaget died on September 17th, 1980, in Geneva, Switzerland. The New York Times described him as "one of the country's most creative scientific thinkers" and as the man whose theories were "as liberating and revolutionary as Sigmund Freud's earlier insights into the stages of human emotional life" ("Jean Piaget." Encyclopedia of World Biography Online).

References

- Britannica, The Editors of Encyclopaedia. "Jean Piaget." Encyclopedia Britannica, 12 Sep. 2022, <https://www.britannica.com/biography/Jean-Piaget>. Accessed 25 October 2022.
- "Criticisms of Piaget's Theory." Massey University Journal, www.massey.ac.nz/~wwpapajl/evolution/assign2/AWarren/crit.html. Accessed 26 Oct. 2022.
- "Jean Piaget." New World Encyclopedia, . 1 May 2018, 20:33 UTC. 27 Oct 2022, 01:02
<https://www.newworldencyclopedia.org/p/index.php?title=Jean_Piaget&oldid=1011227>.
- "Jean Piaget." Encyclopedia of World Biography Online, Gale, 1998. Gale in Context: Biography, link.gale.com/apps/doc/K1631005202/BIC?u=mclin_s_sharonhs&sid=bookmark-BIC&xid=51e3b7ec. Accessed 23 Oct. 2022.
- McLeod, Saul. "Piaget's Stages of Cognitive Development." SimplyPsychology, 18 Aug. 2007, www.simplypsychology.org/piaget.html#. Accessed 26 Oct. 2022.
- Piaget, Jean. "How Children Form Mathematical Concepts." Scientific American, 1 Nov. 1953, <https://doi.org/10.1038/scientificamerican1153-74>. Accessed 26 Oct. 2022.