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An Annotated Bibliography: Cognitive Development in Early and Middle Childhood

["Cognitive Development." *Cognitive Development in Children, Stages & Changes in Adolescence*. Cincinnati Children's. April 2017.](#_top)

 In the article, "Cognitive Development," advancements in the brain refers to the growth and change in intellectual and mental abilities, such as thinking and reasoning. Children between the ages of six and 12 years of age begin to use concrete operations, including addition, subtraction, alphabetizing, and transformation. These are considered concrete operations because children are performing these actions in front of the objects and events they are thinking about. The next form of cognitive development occurs during adolescence, lasts between 12 and 18 years of age. Adolescence is the beginning of complex thought processes known as formal operations. These operations include abstract thinking, the ability to form ideas and questions from known principles, the ability to compare ideas and opinions, and ability to think critically ("Cognitive Development").

 During the ages of 12 and 18 is when adolescence begins and developing teenagers begin to transition between concrete and formal operations. Every adolescent develops in his or her own way and at his or her own pace. For example, adolescents may apply logical reasoning to school work before their personal dilemmas ("Cognitive Development"). In early adolescence, children begin to focus on personal decision making in school and at home. They begin to use formal operations in their schoolwork. Children begin to question and understand parents, caregivers, and teachers as well as rules of society. They begin to form their own thoughts and opinions on numerous topics, which are usually more associated to their own lives. Such topics may include sports, groups of friends, personal appearances, and parental constraint ("Cognitive Development"). With the expansion of complex thinking processes, during middle adolescence, developing teenagers begin to question future concerns. For example, they begin to think before they do by creating their own code of ethics. They begin to question who they are as a person, create their own identity, and consider future goals. Teenagers begin to create long-term plans rather than thinking of the short-term perspective. In the latest phase of adolescence, teenager's thoughts become less self-centered. They begin to think of bigger issues of society, such as global concepts, history, and politics ("Cognitive Development"). Teenagers begin to think of future career decisions and prepare to enter adult society in this time.

[Mah, V Kandice, and E Lee Ford-Jones. "Spotlight on Middle Childhood: Rejuvenating the "Forgotten Years'." *Pediatrics & Child Health,* Pulsus Group Inc, February 2012.](#_top)

 Middle childhood, between the ages of six and 12, are referred to as the "forgotten years" of development, as mentioned in the article "Spotlight on middle childhood: Rejuvenating the 'forgotten years'," published by Kandice Mah and Lee Ford-Jones. Most research is centered on early and adolescent development. During middle childhood, there is much advancement in cognitive, social, emotional, and physical development. Middle childhood marks the point in which a child's mind becomes more refined. The development of a child's brain is heavily dependent on their environment. These cognitive developments offer children the experiences and groundwork they require to be successful in adulthood (Mah and Ford-Jones).

 From birth to adulthood, the human brain is constantly maturing at alarming rates. The most maturation of the brain occurs early on in life. The process of selective brain pruning is influenced by daily experiences, which result in direct axonal projections and synaptic reductions and consolidations (Mah and Ford-Jones). With this being said, even if an individual possesses a mental health condition, with proper nurturing and interactions, it is possible to alter how one will interact as an adult. Pollak et al, who found that despite early experiences in an orphanage, children placed with enriched families began to perform better physically, socially, and cognitively (Mah and Ford-Jones), best proved this in a study. Based on Knudsen's theory, middle childhood is referred to as a "sensitive period," because of the active role the brain plays in cognitive development (Mah and Ford-Jones). During middle childhood, the brain is constantly maturing. Myelination begins to occur, which increases conduction speed and synaptic transmission between the right and left hemispheres. While all of this occurs, the cortical gray matter is being produced (Mah and Ford-Jones). These processes allow brain activity and response times to increase. With many tasks, children show scattered patterns of widespread activation; while older children are more focused and exhibit a select, regional activation. This happens because, as children grow, they figure out with regions of the brain to activate for certain activities. The rate at which this occurs is dependent on the experiences of the child. Children are more likely to reach their full potential when they participate in stimulating environments, experiences, and interactions, which promote their individual capabilities (Mah and Ford-Jones). Middle childhood is the time where children progress into independent individuals. They become prominent members in their families and communities. Children's thought processes begin to be more abstract and they are able to make simple decisions on their own. They learn how to control their emotions and behavioral responses. During middle childhood, the neurons associated with cognition, language skills, and social skills are being consolidated (Mah and Ford-Jones). Children begin to gain cognitive control between the ages of seven and 11. This allows them to understand and process information more effectively. Feedback loops between the forebrain and midbrain transform, which enables regulation of thoughts and actions in the presence of competing stimuli (Mah and Ford-Jones). Language control is more complex, which lasts well into adolescence. These periods of neuromaturation offer the best point to expose children to experiences that strengthen their cognitive abilities and language skills.

[McLeod, Saul. "Jean Piaget." *Jean Piaget, Cognitive Theory, Simply Psychology.* 2015. Web. 13 February 2018.](#_top)

 In the 1920's, Jean Piaget worked for the Binet Institute creating French versions of English intelligence test questions. His interest increased in the explanations children gave for their wrong answers to critical thinking questions. This made Piaget believe there were major differences in the thought processes of children and adults. This led to the creation of Piaget's Theory of Cognitive Development, which explains that children are not born with intelligence and that it is gained through maturation and interaction. According to the article titled "Jean Piaget," by Sean McLeod, Piaget's theory explains how a child learns to create a mental note of the environment in which they are familiar. This theory includes stages of development, research and case studies of cognition in children, and tests to identify cognitive traits (McLeod).

 Piaget focused his theory primarily on children and recorded their progress in distinct stages of cognitive development. The purpose of this theory is to define the process the infant, then the child, takes to develop into an individual who can reason and think critically. According to Piaget, "cognitive development was a progressive reorganization of the mental processes as a result of biological maturation and environmental experience" (McLeod). He believed children create an acceptance of their environment, and then notice differences in what they experience and what they already know. Piaget's Theory of Cognitive Development includes four stages of development, which measure increasing sophistication at certain ages. The four stages include (1), Sensorimotor stage (birth to age 2), (2) Pre-operational stage (age 2 to age 7), (3) Concrete operational stage (age 7 to age 11), and (4) Formal operational stage (age 11 to adolescence and adulthood) (McLeod). Each child goes through the same stages in the same order; however, some children mature at different rates. The main achievement in the Sensorimotor stage is object performance. This refers to the thought process that even though an object disappears, it does still exist. In order to achieve this form of development, a child creates a schema for the object. During the Preoperational stage, young children are able to think of two things at the same time. This allows a child to make one thing, either a word or object, have more than one meaning. The Concrete operational stage is considered a major turning point in a child's cognitive development because it marks the beginning of logical or operational thinking (McLeod). This means children are able to mentally work things out rather than physically. By age six, children can conserve mass, at age seven, weight, and at age nine, mass. Conservation is the child understands that an object's quantity stays the same even if the appearance changes. The final stage, Formal operational stage, begins around age 11 and lasts until adulthood (McLeod). This stage marks the beginning of abstract thinking.

[Oswalt, Angela. "Early Childhood Cognitive Development: Introduction." *Mental Help Early Childhood Cognitive Development Introduction Comments,* Mental Help. 16 January 2008.](#_top)

 In the article "Early Childhood Cognitive Development: Introduction," Angela Oswalt mentions that as young children grow, they mature both physically and mentally. Young children learn new skills to help them interact with the environment around them. Children also learn new ways on how to process and store new information. It is a bit complicated to count and track the amount of cognitive development. Since all children mature at different rates, it is difficult to determine how fast a child's mind is developing at certain ages. This is the reason why people rely on the theories developed by the esteemed philosophers such as Piaget, Erik Erikson, and Bronfenbrenner.

 Piaget created stages of development to measure when skills are mastered. "According to Piaget, children in the Preoperational stage of development build on skills learned and mastered during the Sensorimotor stage" (Oswalt 2). During the sensorimotor stage, young children begin to broaden their imagination. Their increased use of imagination turns their playtime into a fantasy. For example, many little girls may pretend to be princesses and live in an elegant castle or little boys may pretend to be a superhero. When children begin to mature cognitively, their playtime fantasies become more elevated with a more sophisticated theme. Their stories introduce more characters with more advanced plot lines. Children begin to make up new games with elaborate rules. "According to Piaget, playing isn’t just fun, it is an important part of brain development" (Oswalt 2). The cognitive skills developed in the Sensorimotor stage are usually associated with children between the ages of two and seven. However, once again, not all children develop at the same rate.