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An Analysis of Piaget's Genetic Epistemology

Based on the readings from Chapters 1 and 6, Piaget's views of knowledge and development are associated with the 3 epistemological traditions described in Chapter 1 (objectivism, pragmatism, & interpretivism). In his early years, Piaget embraced *interactionism*, which can be described as a blend of nativism and empiricism (p. 191). *Empiricism* (a.k.a. physical knowledge) states that knowledge is created from the accumulation of sensory experiences (p. 12, p. 190) while *nativism* holds that some knowledge is innate and forms the basis for the expansion of knowledge (p. 12, p. 190). Ultimately, Piaget chose the term *interactionism* to describe this theory because "cognition is an interaction between heredity and the environment" (p. 191).

To break this down further, Piaget recognized that there are three types of knowledge acquired by children: 1.) physical-empirical knowledge, 2.) logical-mathematical knowledge, and 3.) social knowledge (p. 192-193). (See Table 6.1, p. 193)

- **Physical-Empirical knowledge** is gained through perceptual understanding discovered by a child's actions on objects, or knowledge about the physical properties of objects. Piaget believed in the active role of a child during development. Furthermore, "cognition is rooted in action, and actions…evolve to become increasingly internal as children acquire rudimentary physical knowledge" (p. 191-192). To simplify this, a child gains knowledge through play.
- **Logical-Mathematical knowledge** is abstract and conceptual in nature. Knowledge is invented, but "through actions on objects that are fundamentally different from those actions enabling physical knowledge" (p. 192-193). In other words, the actions themselves are the source of knowledge.
- **Social knowledge** is culturally constructed. It is "culture-specific and can be learned only from other people within one's cultural group" (p. 193). Engaging in social negotiation, for example, would effectively lead to the construction of social knowledge.

In addition to the three types of knowledge, Piaget "believed children progress through an invariant sequence of four stages" that "reflect qualitative differences in children's cognitive abilities" (p. 194). These stages are sensorimotor (0-2 yrs.), preoperational (2-7 yrs.), concrete operational (7-11 yrs.), and formal operational (11+ yrs.). (See Table 6.2, p. 195). Although there is some variability within the four stages, Piaget firmly believed that children are active in the learning process. Adding new knowledge, building on existing knowledge, and adapting previous knowledge through new knowledge is a tenet of Piaget's theory.

If we look back to Chapter 1, both behaviorists and constructivists believe that knowledge is developed or realized, constructed, and reconstructed. In Chapter 6, Piaget's theory describes how "knowledge is invented and reinvented as a child develops and interacts in the world" (p. 191). This is similar to constructivism (Chapter 5), which in turn is "more consistent with the interpretivist perspective" (p. 14). Driscoll further points out that Piaget referred to his view as constructivism "because knowledge acquisition is a process of continuous self-construction" (p. 191).

To reference Chapter 1 again, interpretivism can be described as when "reality and knowledge are constructed by the knower through rational thought" (p. 1). Additionally, interpretivism posits that knowledge is constructed by the learner based on the learner's frame of reference, which is similarly consistent with rationalism and idealism (p. 12-13). Driscoll points out that interpretivists (and some nativists) "assume that all knowledge is actively constructed within the organism, rather than being received passively from the environment" (p. 190). Therefore, Piaget's theory aligns with interpretivism, which is an epistemological tradition discussed in Chapter 1.

Piaget's theory of cognitive development remains the most complete and widely accepted learning theory. Although many support Piaget's rationale, modern developmental theorists now acknowledge that his theory is wrong or incomplete in several aspects (p. 189). Here is a breakdown of the support, concerns, and merits of Piaget's theory.

Evidence to Support Piaget's Developmental Stage Theory

Ages 0-2

Many learning theories do not differentiate between children and adults, so it's important to remember that Piaget's theory applies only to children and *not* to adult learners. Piaget emphasized that children's cognitive skills are very different from those of adults. Similarly, children experience the

world quite differently than adults. While many people never perceive infants as actively engaging in learning, Piaget put into words that infants go through "immense cognitive changes" (p. 196) during development. He further explained that "infants' behavior begins to reflect clear goals, and these goals progress from concrete to abstract" (p. 196). Even though cognition is not overt, infants learn a lot of information relatively quickly.

Ages 2-7

Piaget suggested that children in this stage learn best through pretending and symbolic play (p. 197). I have definitely seen the positive effects of learning through play with my own kids. Additionally, spelling out that children are in fact naturally egocentric during early development helps preoperational teachers better hone their teaching skills to meet their kids' educational needs. In addition to this, Piaget also acknowledges that young children simply cannot process a large amount of information, and this is why chunking is necessary.

Although Piaget's theory aligns primarily with development, he has successfully impacted modern day classrooms and teaching practices as well. As a teacher who is already familiar with Piaget's educational impact, arguing that children learn best by discovery, exploration, and play has led to more student-centered classrooms. I can support this by contrasting my own elementary school experience in the '80s (sit, be quiet, learn) with my own kids' elementary school experiences today (adaptive, fun, engaging). Furthermore, I think that collaborative activities and peer-teaching are more prominent today than when I was in school. As a teacher, I have personally seen how collaborative classrooms facilitate learning by promoting social interaction and learning from peers.

Evidence to Question Piaget's Developmental Stage Theory

Because Piaget's theory has been foundational for so long, it was only a matter of time before solid criticism emerged. However, criticism does not mean that his theories are no longer valid. In fact, many other theories developed out of Piaget's Developmental Stage Theory. (See Table 6.3, p. 200)

- Claim 1: *The Sequence of Stages is Invariant* (p. 199-200). Piaget suggested that culture does not affect the ages at which children reached certain stages. Actually, the opposite is true. Children from different cultures do reach the 4 stages, but within different age ranges. Plus, there is no guarantee that formal operations will be reached by all cultures. In addition to this, people have developmental differences that are not based around age.

- Claim 2: *The Stages Represent Qualitative Changes in Cognition* (p. 200, 202-202). Children do not always reason consistently within a single stage. Children also learn more at the different stages than Piaget originally thought. Furthermore, it has been found that through training, children can demonstrate changes in reasoning that may correspond to the changes happening naturally as children mature. Of course, researchers have also found that children sometimes demonstrate unsuspected cognitive strengths too, which further challenges Piaget's theory.
- Claim 3: *Children Exhibit the Characteristics of Each State* (p. 200, 202). While preoperational children are not egocentric all the time, sometimes children are egocentric past the preoperational stage. The nature of the task rather than the stage of development has been deemed critical in determining when children are egocentric.
- Claim 4: *Global Restructuring Characterizes the Shift from Stage to Stage* (p. 200, 203-204). Reasoning is more domain-specific than global. Learners are not necessarily consistent reasoners among the different stages. It's easy to challenge the foundations of Piaget's theory when you consider the seemingly endless variability in children's thinking.

Overall, I don't think a person's age can necessarily determine a person's cognitive development or maturity. As Robbie Case suggests, "biological maturation [is] an important contributor to operational efficiency" (p. 206). In other words, biological maturity in the brain helps it operate more efficiently. Additionally, I find it interesting that "instruction can facilitate cognitive change when it encourages children to explain their observations and reasoning" (p. 211). It makes sense that having to verbalize internal reasoning is more difficult because a person is having to explain their internal thought processes.

Overall Merits of Piaget's Developmental Stage Theory

Piaget's Developmental Stage Theory has been the basis of many modern educational and psychological theories. In essence, Piaget's theory was the first of its kind. No other theory had attempted to explain thought and reasoning as they relate to cognitive development. It is worth knowing how children learn so differently than adults because any educational experience should be both appropriate and meaningful for the child. A child cannot necessarily utilize learning theories meant for adults and expect for learning to occur. If anything, a child would become increasingly frustrated if he or she did not understand the learning expectations. Because Piaget's theory is limited

only to understanding children, it has helped countless others understand the process and implications behind child learning. His theory certainly permeates the realm of childhood education even though it's not the sole consideration for teaching and learning. Ultimately, I think that combining various theories and strategies is the best way to accommodate the unique learning needs of children.

Piaget's Theory Applied to Online Debates

Based on the disequilibrium element of Piaget's theory, my first inclination is to agree that online debates can be an effective means of cognitive development. As the *Theory Matrix* table describes (p. 221), the role of the learner is to 1.) actively manipulate ideas (and objects), 2.) experience cognitive conflict, and 3.) (re)invent knowledge through interaction with the world and surrounding people. In similar fashion, the role of the instructor is to 1.) provide a rich learning environment that supports activity of the learner and encourages interactions with peers, and 2.) ask probing questions to make to make children [learners] aware of conflicts and inconsistencies in their thinking.

For this class, the online debates have been a helpful learning tool for several reasons. Primarily, we were assigned a viewpoint that did not necessarily align with our personal beliefs and opinions. For many of us, justifying a belief that we did not agree with caused disequilibrium (cognitive conflict). In being required to defend a viewpoint that I did not agree with, I gained new knowledge by interacting with classmates who had their own thoughts and opinions on the topic. When considering others' viewpoints, I ended up revising some of my personal beliefs and opinions. In addition to this, I acquired new knowledge by simply researching and reading about the viewpoints that I did not truly support. Furthermore, we must consider the motivation behind learners in this class. We are adult learners who are 1.) paying for this class, and 2.) inclined to perform well because we are seeking to earn a degree. Therefore, we are considered to be highly motivated whereas children require more considerations.

For children, evidence from Piaget's theory does not support using an online debate as a successful learning platform. One of the primary factors is that preoperational children have difficulty accepting others' points of view. Similar to the constructivist viewpoint, children would be required to consider others' perspectives in order for online debating/learning to be successful. Another factor to consider is that concrete operational children are unable to reason hypothetically. They do not yet

possess the skills to think and discuss *potential* answers to a question or problem, which is a requirement for debating.

Some other factors that inhibit children learning from learning through online debating (and even classroom debates) include learner motivation, the learner's age and stage, and the debate topic. Children are not motivated in the ways that adults are. Plus, adults' cognitive capabilities and maturity levels increase the effectiveness of online debates. For children to participate in an online debate, the teacher must adequately prepare them ahead of time. This would include explaining what an online debate is, how it works, debate rules, and what the topic is. The teacher would need to ask clear and specific questions while playing an active role throughout the entire debate process. Additionally, the teacher would probably need to create debate teams, similar to our online debates. Children would be overwhelmed if too many people were participating in an online debate.

References

Driscoll, M. P. (2004). *Psychology of learning for instruction.* Harlow: Pearson Education.