Information Processing Theory (R.J. Lachman)

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Information Processing Theory is a cognitive approach designed to understand human learning. Several perspectives of this theory emerged from the cognitive revolution in psychology beginning in the 1950s. The invention of the technological age of computers brought with it an innovative way of understanding how information is processed in humans. This lead researcher to draw analogies between the processing ability of humans and computers. The human-computer analogy developed from the foundation that as computers are able to process information so too can humans in a very similar method. Both encompasses 'cognitive' processes such as learning or obtaining information, solving problems, making decisions and recalling or retrieving information.

According to Lachman, Lachman, & Butterfield (1979), this analogy is primarily understood as how people absorb, interpret, recode and recall information. Computers were understood to receive input, recode it in a language it understands, and make decisions about it that input. The authors distinguished that the data we receive is different from an event that evokes a functional reaction and similarly the output is different from a response. They noted this distinction to highlight that cognitive and mental processes are different from the relationship of a stimulus-response action.

According to this analogy of information processing, learning is the process of acquiring knowledge transmitted from a teacher to the student. Thus, these teachers are the distributors of knowledge, and the student learner not only receives the information but are also the processors of that information. While there are several ways this teaching-learning interaction can occur, the

most traditional methods include using textbooks and lecturing. The underlying principle of information processing is that human beings are information processors that exist in a world where cognitions can be complicated and involve a series of taxing processes. Thus, this system is responsible for how as well as the types of information the person attends to, selects and makes decisions about. Unlike computers, this is a process that emerges, develops and becomes refined over the years to increase the efficiency of the human cognitive system.

The information-paradigm assumes that human cognition synonymous with brain development over time, develops greater capacities to take in, encode and retrieve information. The more knowledge that an individual comes into contact with, the more associations and strategies we learn to better and diversify our systems to categorize and respond to input from the world. Research generated across multiple disciplines and dimensions of psychology have shed light on how these information processes are transformed into the systems they become.

This theory also depends upon advances made in mathematics and computer science. Psychological research on memory, attention, language, executive functioning, perception, and problem-solving reveal how information is utilized and stored and subsequently used to guide behavior as well as to make decisions.

The assumption of this theory is that information from the environment is continuously being shaped, learned and stored as long-term memory to increase the accuracy, speed, and efficiency at which information is processed. For this to happen, the individual not only has to take in the external information but attend to it and make sense of it in a way that utilizes other domains such as emotions, cognitions, and behaviors. Information can then take several pathways depending on the type and level of data entering the system. Theorists are interested in how the mind transforms this information for use and its understanding of human intelligence

and concepts. Given that our cognitive processes are not part of a fine-tuned machine, programmed to translate information correctly every time, frequent mistakes are likely to occur. Information processing highlights the importance of adaptive mechanisms that allow the flexibility of making corrections, choosing alternatives and rejecting errors. This adaptiveness speaks to the complexities of human thought processes and human beings as processors of information.

Although, there are different theories of information processing, what is understood about learning is that it is the acquisition of mental representations involving a memory system. The multiple stages that occur between input and output represent the intricate flow of information. Storage of this information goes beyond short-term, long-term and sensory memory, to include the essential processes of attention, rehearsal, chunking, encoding, and retrieval. The paradigm of information processes remains concerned about the nature of information and processing of this information to give a more in-depth analysis of intelligent behaviors.

Further Reading

Hinsz, V. B., Tindale, R. S., & Vollrath, D. A. (1997). The emerging conceptualization of groups as information processors. Psychological Bulletin, 121(1), 43–64. doi:10.1037/0033-2909.121.1.43

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