

Meaningful Learning as Assimilation to Schema

Although "Ausubel's thinking about the role of abstract knowledge structures in learning from text generally was on the right track," Anderson, Spiro, and Anderson (1978, p. 439) found the theory of meaningful learning vague and inconclusive. They claimed that schema theory could bring precision to Ausubel's ideas.

Most modern cognitive conceptions of schema harken back to Bartlett (1932). In a study investigating the nature of remembering over a long period of time, Bartlett used the term *schema* to mean an organizing and orienting attitude that involves active organization of past experiences. Bartlett found that his subjects' recall of "War of the Ghosts" contained inaccuracies that could be directly related to their own interests and attitudes. He theorized that they invoked a relevant schema for understanding the story, and then, at recall, reconstructed in accord with the schema details about the story that they had forgotten.

Ausubel et al. (1978) acknowledged a similarity between anchoring ideas and Bartlett's notions of schema, but then they dismissed Bartlett's position as being fundamentally different from Ausubel's. Schemata are perceptually based, they argued, whereas anchoring ideas are cognitive. Bartlett theorized about the reconstructive nature of retention; Ausubel was interested in the constructive nature of learning. Ausubel et al. (1978) suggested that recall is really not reconstructing original meanings, it is reproducing information that has undergone memorial reduction.

When Anderson et al. (1978) suggested that the concept of schema might clarify Ausubel's theory, they took a fundamentally cognitive approach, conceiving of schema as a generic characterization of things and events. Thus, "to interpret a particular situation in terms of a schema is to match the elements in the situation with the generic characterizations in the schematic knowledge structure. Another way to express this is to say that schemata contain *slots* or placeholders that can be *instantiated*...with certain particular cases" (Anderson et al., 1978, p. 434; emphasis in original).

As an example, consider how CN's and GB's knowledge about cooking in the Making Mayonnaise scenario can be reinterpreted in terms of a schema. A "cooking" schema is likely to have slots for details about cooking, such as what utensils are used, what types of mixing could be employed, and so forth. To the extent that individuals have had experience cooking different things, these slots may be filled, or instantiated, with particular information. CN's and GB's responses to the question of how to make mayonnaise are evidence that they have not experienced beating eggs and oil together. Because of this, their schema about mayonnaise itself is based on perceptual features such as taste and consistency. This incomplete schema

leads them to incorporate how it is made.

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