

# Constructivism and Schema Theory

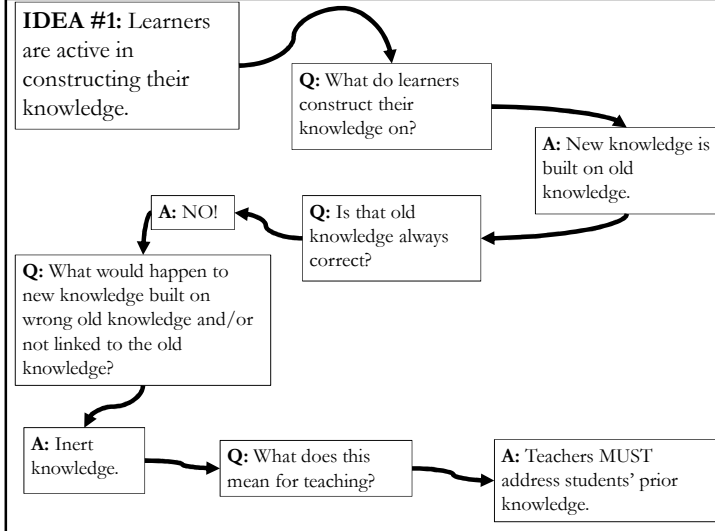
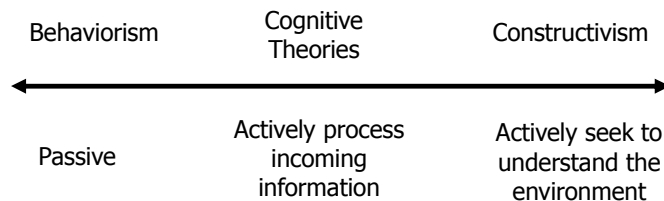
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JETS

## Learning Goals

- Explain the two main ideas of constructivist theories of learning.
- Explain what a schema is and how it is useful for learning
- Explain three ways that schemas can be modified

## Constructivism

- **Constructivism:** Learners construct their own meaning from information in the environment



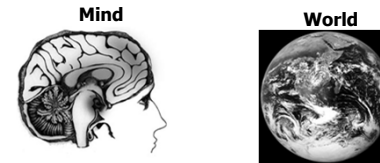
## Schema Theory

## Schema Theory

- **Schema Theory:** Theory of how knowledge is represented and how the representation of knowledge guides the application of knowledge
  - Incoming information from the environment is organized around previously developed schema

- |             |         |
|-------------|---------|
| 1. Yam      | 1. No   |
| 2. Pound    | 2. No   |
| 3. Mortar   | 3. No   |
| 4. Boil     | 4. No   |
| 5. Pot      | 5. No   |
| 6. Steaming | 6. Yes  |
| 7. Pole     | 7. Yes  |
| 8. Little   | 8. Yes  |
| 9. Brown    | 9. Yes  |
| 10. Product | 10. Yes |

## Constructivism



**Schema:** Mental structure for representing concepts

## Schema

- **Schema:** Structure for representing general concepts in memory
  - Contains generic/abstract knowledge – Gist
  - Reflects prototypical properties of experiences based on many occurrences of similar experiences
  - Schemas are developed without conscious awareness

## Properties of Schemas

- Schemas are developed by prior knowledge and experience
- Schemas can be revised based on new information, though it is difficult
- Information from the environment is perceived depending on prior schemas

## Properties of Schemas

- Schemas help people understand, interpret, and remember incoming information
- Schemas facilitate memory because it is easier to remember a schema than specific details
- Culture influences schemas
  - Memory for knowledge or an event is determined by the cultural context in which it takes place

## Modifying Schemas

- **Accretion:** New information is remembered by an existing schema. Schema is NOT changed.
- **Tuning:** New information cannot be fully explained by an existing schema, so a new schema changes to reflect the new information
- **Restructuring:** New information cannot be stored by tuning a schema, so a new schema is created

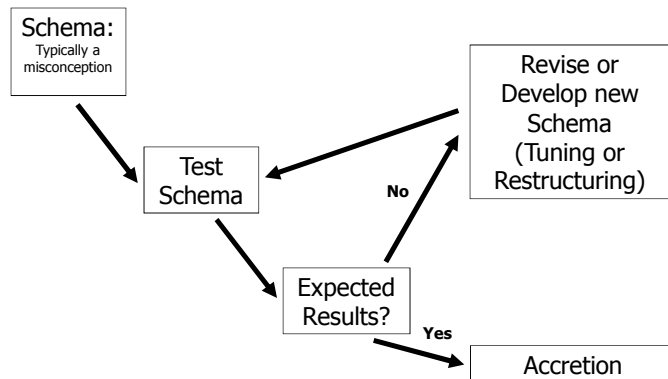
## Modifying Schemas Examples

- **Accretion:** Attend a wedding, the wedding is exactly what you experienced before.
- **Tuning:** Attend an American wedding, where the bride does not dance down the aisle.
- **Restructuring:** Attend a wedding ceremony done while bicycling

## Modifying Schemas Examples

- **Accretion:** You have already learnt about observational learning
- **Tuning:** Operant conditioning explains learning processes that you have experienced, so you add the concept to your previous schema
- **Restructuring:** Schema theory is unrelated to anything you have known before

## Constructivism: Process of Learning



*Reply of the representatives of the Six Nations to an invitation by a Williamsburg College in Virginia, as cited by Benjamin Franklin, 1784*

For we know, that you highly esteem the kind of learning taught in those colleges, and that the maintenance of our young men, while with you, would be very expensive to you. We are convinced, therefore, that you mean to do us good by your proposal; and we thank you heartily. But you, who are wise, must know that different nations have different conceptions of things; and you will therefore not take it amiss, if our ideas of this kind of education happen not to be the same with yours. We have had some experience of it; several of our young people were formerly brought up at the colleges of the northern provinces; they were instructed in all your sciences; but, when they came back to us, they were bad runners, ignorant of every means of living in the woods, unable to bear either cold or hunger, knew neither how to build a cabin, take a deer, or kill an enemy, spoke our language imperfectly, were therefore neither fit for hunters, warriors, nor counselors; they were totally good for nothing. We are however not the less obliged by your kind offer, though we decline accepting it; and, to show our grateful sense of it, if the gentlemen of Virginia will send us a dozen of their sons, we will take great care of their education, instruct them in all we know, and make *men* of them.

**IDEA #2:** Social interactions are important in the knowledge construction process.

## Types of Constructivism

- **Psychological Constructivism:** Learning as improving individual schemas
  - Many cognitive theories of learning can also be classified as Psychological Constructivist theories
- **Social Constructivism:** Learning as increasing one's ability to participate with others in activities meaningful within the culture
  - Social Constructivism is similar to Situated Cognition (next topic)

## Constructivist Five Conditions for Learning

- Embed learning in complex, realistic, and relevant learning experiences
- Provide for social interaction and shared responsibility in learning
- Support multiple perspectives and multiple representations of content
- Nurture an understanding that knowledge is constructed
- Encourage ownership in learning