CHAPTER 7:
THREE COGNITIVE THEORIES - I
(BRUNER)

By: Luan Feng
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Comparison of Cognitive and Behavior Theory

1. Cognitive theory is concerned mainly with explaining higher mental processes (perception, thinking, language, problem solving, information processing, decision making, and knowing).
2. Cognitive theory is based more on human than on animal research—in contrast with behaviorism.
3. Cognitive theory typically presupposes some of mental representation (what we think of as meaning).
Bruner compares the development of the child to the evolution of the human race.

### Evolution of the Human Race

<table>
<thead>
<tr>
<th>Evolution</th>
<th>Inventions</th>
<th>As a result</th>
</tr>
</thead>
<tbody>
<tr>
<td>amplify motor capacity</td>
<td>lever, knife, arrow</td>
<td>became stronger, faster</td>
</tr>
<tr>
<td>amplify sensory capacity</td>
<td>telescope, radio, TV</td>
<td>enlarged ability to see, hear, feel</td>
</tr>
<tr>
<td>amplify reasoning capacity</td>
<td>computer language and system</td>
<td>enrich intellectual power</td>
</tr>
</tbody>
</table>

### Development of the Child

<table>
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<tr>
<th>Development</th>
<th>Use of</th>
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<th>Examples</th>
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<tbody>
<tr>
<td>enactive representation</td>
<td>immediate sensation</td>
<td>infants, small toddlers</td>
<td>Learning by doing, sitting up, walking</td>
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<td>iconic representation</td>
<td>mental image</td>
<td>small children</td>
<td>words represent objects, simple math</td>
</tr>
<tr>
<td>symbolic representation</td>
<td>abstract symbol</td>
<td>begins in teenager</td>
<td>abstract ideas, concepts</td>
</tr>
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</table>
Representation: Categorization

In Bruner’s system, categorizing describes both perceptual and conceptual activity. A category can be thought of as a rule for classifying things as being equal. As a rule, it specifies the attributes that objects must have before they can be put into a given category.

**Object?**

- have pages
- have a cover
- contain writing
- have a title

……

Category is a collection of rules

Category of book
Decision Making

First, to make a decision about whether an object belongs in a given category. Second, to make a decision about how the object should be reacted to.

Traffic light is red is the result of explaining an event belonging to the category red light.

Implicit in this act of categorizing is the decision not to walk across the street.

(Answer 2)
Coding Systems

Coding systems are arrangements of related categories. Higher level categories are more generic in that they subsume more examples and are less defined by small details.

- Food
  - Fruit
    - Apple
    - Pear
    - Orange
  - Meat
    - Pork
    - Turkey
    - Beef
To attain a concept is to discover what attributes are basic for membership in a given category.

<table>
<thead>
<tr>
<th>Three Kinds of Concepts Based on the Attributes that Define Them</th>
</tr>
</thead>
<tbody>
<tr>
<td>concepts</td>
</tr>
<tr>
<td>conjunctive</td>
</tr>
<tr>
<td>disjunctive</td>
</tr>
<tr>
<td>relational</td>
</tr>
</tbody>
</table>

- can be used to write
- can be held in the hand
- delusion or phobia or mania
- has four sides, but top side = bottom side right side = left side must be equal in length
Strategies for Concept Attainment

Bruner describes several strategies for attaining concepts:

**simultaneous scanning:** generating all hypotheses—impractical and impossible for most subjects.

**successive scanning:** trial and error—uneconomical.

**conservative focusing:** accepting the first instance as the complete hypothesis and varying one attribute value at a time—economical and effective.

**focus gambling:** riskier than conservative focusing—sometimes a faster payoff, sometimes a slower one.

experiment on strategies for attaining concepts
More Recent Research on Concepts

Bruner’s work has led to considerable current research on categorization. Among the findings from this research are the following: Categories vary in generality, but the most specific category (poodle) is not learned before a more general category (dog); and abstraction is always involved in categorization. People abstract the central characteristics of a class of objects as a result of categorizing to examples of that class.
The **prototype model of abstraction** says that people abstract highly general notions of concepts from exposure to various examples of the concept; the **exemplar model** (which is less abstract) says people remember specific, representative examples of concepts.

The difference between these two models is that the prototype model assumes a higher level of abstraction. A prototypical category for "bookness", for example, is an abstraction of the characteristics of many examples of books. In contrast, an exemplar category for book is defined by examples of real books.

*Answer 3*
Educational Implications of Bruner’s Theory

Bruner is a strong advocate of discovery oriented teaching methods.

For example, in early grade learners are exposed to the simplest concepts in a particular area; at succeeding grade levels they are re-exposed to the same area but at progressively more advanced conceptual levels.
Thank You!
Question 1

1. To which mode does this classroom activity belong: learning subtraction by showing 6 items and physically removing 4 of them? Why?

(A) Enactive
(B) Iconic
(C) Symbolic

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Answer 1

(A) The Enactive mode

In the Enactive mode students learn through their own actions. By actually removing the items the students gain an understanding of subtraction and learn that 6 minus 4 equals 2. (In the iconic stage, when they progress to math work without counting, they will see 6-4= and know the answer is 2.)
Question 2

Please, explain the decision making process when you see a red traffic light.

Answer 2

First, traffic light is red is the result of interpreting an event belonging to the category red light.
Second, implicit in this act of categorizing is the decision not to walk across the street.
What’s different between the two models of abstraction?

The difference between these two models is that the prototype model assumes a higher level of abstraction. A prototypical category for "bookness", for example, is an abstraction of the characteristics of many examples of books. In contrast, an exemplar category for book is defined by examples of real books.