

Batna 2 University
Department of English

Lectures in Cognitive Psychology
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EXTENDED DISCUSSION MODES OF REPRESENTATION AND COGNITIVE GROWTH: BRUNER'S VIEW

Bruner has developed a view of the development of representation which is heavily indebted to Piaget's work. Bruner (1964, 1966) suggests that human beings represent the world in three modes: the enactive, the iconic, and the symbolic. The enactive mode involves representation through action. When Lucienne opened and closed her mouth to signify her desire to open and close the box (see p. 183), she used the enactive mode of representation. The iconic mode is representation using visual images, seeing in your mind's eye something that in reality is not in view. The symbolic mode is representation using language. Bruner's use of the term "symbol" coincides with Piaget's use of the term "sign." The earliest mode used by the infant is the enactive mode. At about 1½ or 2 years of age the iconic mode emerges, and after that the symbolic mode appears.

A provocative experiment by Bruner and Kenney (1966) illustrates the difference between iconic and symbolic representation, and also directly supports the claim that iconic representation emerges before symbolic. Bruner and Kenney arranged a set of nine plastic glasses in a three-by-three matrix, displayed in Figure 7-7. Along the vertical edge the glasses increased in height, while along the horizontal edge they increased in width. After acquainting children with the display, the experimenters scrambled the glasses and asked the children to reconstruct or reproduce the array exactly as it had been originally. Then the glasses were scrambled once more, but this time the glass that was formerly in the southwest corner of the grid (the shortest and thinnest glass) was placed in the southeast corner. Children were then asked to build an array like the original around the newly relocated glass. In short, they were asked to transpose the matrix. Although children ranging in age from three to seven years were tested, it is most interesting to focus on the performance of the five-, six-, and seven-

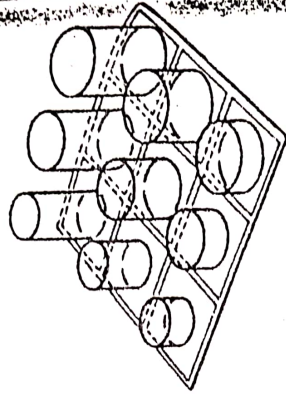
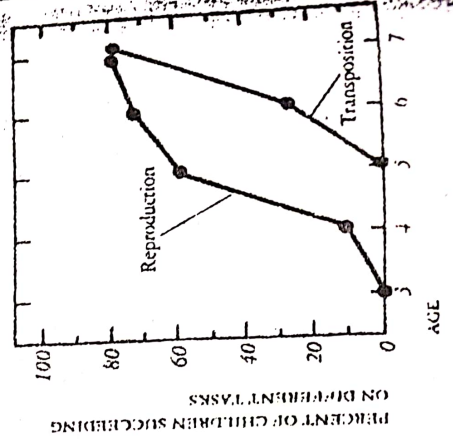


FIGURE 7-7

The matrix presented to children by Bruner and Kenney (1966). Seven-year-olds can usually reproduce the matrix around one glass that has been transposed by the experimenter (as if the board had been turned), but five-year-olds cannot because they are unable to use the symbolic mode of representation.

FIGURE 7-8

Percent of children of various ages who succeeded in reproducing and in transposing the matrix presented in Bruner and Kenney's (1966) experiment. Adapted from J. S. Bruner and H. J. Kenney. On multiple ordering, in J. S. Bruner, R. B. Oliver, and P. M. Greenfield, eds. *Studies in Cognitive Growth*. Copyright 1966. Reproduced by permission of John Wiley & Sons, Inc.



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year-olds. On the reproduction task a majority of the five-, six-, and seven-year-olds responded correctly. On the transposition task however, none of the five-year-olds and only a small fraction of the six-year-olds succeeded. Not until the seventh year did the task become performable (see Figure 7-8).

Bruner and Kenney suggested that five-year-olds, not old enough to have mastered the symbolic representation required for this task, had to rely on the iconic mode. These children had a visual image of the original array in memory, a sort of picture taken at the time the array was seen and then stored away. They responded to the problem by reading this image and making a copy of it for the experimenter. However, children cannot copy an image of the original as a means of solving the

transposition task because they cannot get any match between the transposed glass the experimenter has placed on the board and the picture they have in their heads. Thus, five-year-olds fail at the transposition task because they are being asked to reproduce something they have never seen before. But many of the seven-year-olds succeeded, and we must ask why.

The older children, according to Bruner, had translated their information about the array into the symbolic mode. In short, they used a set of verbal rules to guide them, such as "It gets fatter going one way and taller going the other." Being able to render the matrix into a verbal or symbolic formula allowed the child to preserve and recognize the basic structure of the matrix despite rotation.

CONCEPT FORMATION

A concept is an abstract grouping of experiences that helps to reduce their complexity. Some concepts are truly abstract, such as the concept of happiness, while other concepts define categories of objects or events which are themselves quite concrete. The concept "ball" encompasses a set of concrete instances that are likely to be seen in similar situations; consequently, this concept appears quite early in the young child's repertoire of abstractions. Developmental psychologists have asked two broad questions about children's concepts: How are they formed during the course of development? How are they used by children in various situations?

As in other areas, Piaget has contributed a great deal to our understanding of the development of concepts, especially in his investigations of the concept of object permanence. According to Piaget, during the sensorimotor period children gradually make a discovery that will mark their interactions with the world for the rest of their lives. They learn that objects encountered in the world have a permanent existence independent of their own perceptions. The heart of the progression can be seen by following the concept of object permanence through the six sub-stages of development that occur during the sensorimotor period (Flavell, 1970a).

Stages 1 and 2 (0 to 4 months) Most researchers seem to agree with Piaget that the infant does not have the concept of object permanence at this early age. In a technique used by Bower (1970), among others, objects are made to "vanish" by sliding a screen between them and the

As an extension to Bruner's mode representation and cognitive growth, the interest lies in his notions of reproduction and transposition. Our focus rests on a choice to make as teachers and teachers to be:

Investing is our delivery to pupils or students towards the obtention of good reproducers or rather attain excellent transposers?

The choice would mean a different pedagogical design for each

Consequently, two different models of evaluation.

Discussion:

- Reproduction can be a consequence of poor mastery of language.
- A reproducer is constantly dependant on the original source / trainer.
- A transposer can become critical of the source Rebellious
- Current evaluation practices mostly relying on learning by "role" or "understanding".

Frustration

The term frustration is often used to describe a state characterized by baffled impulses giving rise to irritating dissatisfaction. The blocking of an impulse leads to frustration, and individuals are subjected to such blockings at such stages of development: the grown-up at work, the schoolchild at his homework, and the baby when its needs remain unsatisfied.

If an individual is continually exposed to serious frustration, it is clear that harmful disturbances may appear in his personality. There has been, ever since Freud, much lively discussion about how this condition affects the development of personality. What at least seems clear is that a child's physical and or mental development can hardly be fostered if the child is neglected in such important aspects as security and protection, with all the affection, consideration and material care that they involve.

Illustrative experimental work in this important field of developmental psychology has been performed by, among others, Norman Maier, an American psychologist. He considers that his results are applicable to both human beings and animals. Maier used Lashley's experimental set up. The rat has to jump from a platform towards one of two cards – each carrying a different design. The “correct” card gives way and the rat is rewarded (with food), while the other card is fixed and the rat is punished (falls into a net).

In Maier's experiment, the rat was set in an insoluble problem. Reward and punishment were melted out arbitrarily. There was no definite arrangement or pattern of the cards which should allow a predictable result. In such a situation, the animal refuses to make any choice, eventhough it may be very hungry. A new form of persuasion must be introduced before the animal will jump. Maier directed a puff of air at the rat. Compelling a choice, in this way, often leads to behavioural fixation of a highly stereotyped kind: the animal jumps again and again at the same card or at the

space between the cards. Fixation may become so permanent that no changes occur in the behaviour pattern: if a card is removed and food is placed, clearly visible in the opening.

Main types of frustration behaviour:

Maier distinguishes between three main types of frustration behaviour: fixation, aggression, and regression.

In **fixation**, the behaviour pattern cannot be modified and may seem unintelligent; it does not allow adjustment to a specific situation. Such behaviours can, sometimes, be observed in children with strictly formed habits, and at school futile efforts to keep up in a certain subjects may lead a pupil – being unable to grasp something really quite simple. Difficulties with mathematics at school sometimes provide examples of such fixation. At times, fixation takes the form of resigned disinclination.

Aggression implies that the “individual” makes blind attacks as a reaction to frustration. Aggression is not always directed against the immediate cause of the frustration. A schoolchild who has been subjected to criticisms or ironic comments by the teacher, or an adult who has been reprimanded by his superior at work, often works off his irritation on those he can command, but who are quite innocent in this connection, or he bangs doors and kicks the furniture. The need for a scapegoat is a general phenomenon, besides being a fascinating theme in the history of religion. Aggressive behaviour may also be directed against the individual himself as a consequence of an exaggerated sense of guilt.

Regression means a return to earlier and more primitive forms of behaviour. A grown-up who cannot have his own way may scream and act like a child, while a child may revert to the baby stage to gain its ends. Bed-wetting and thumb-sucking or marked dependency on the mother at a stage when this dependency has usually been overcome, are examples of what may be signs of regression due to frustration.

Other defence mechanisms: Among the defence measures adopted against frustrating internal tensions are certain other mechanisms intended to bring the organism into mental equilibrium. The whole of this discussion is based on parts of Freud's theory of personality dynamics.

Rationalization is the justification of an act after it has been performed, to avoid feelings of guilt from blameworthy behaviour. It also appears in eager assurances of, for example, enjoyment of a situation which is actually experienced as disturbing and unpleasant. A pupil who has failed in his work at school may make excuses to himself by claiming that the teacher was unfair, or that he had a cold – which he makes seem more serious than it was.

Compensation means that failure in one field endeavour leads to greater efforts to succeed in another and there gain longed-for approval. A boy who finds it difficult to shine in intellectual subjects, at school, may instead devote himself eagerly to gymnastics in order to be all the better there.

Projection is a method of avoiding guilty feelings by attributing one's own mistakes and bad features to others. A lazy person accuses others of laziness.

Repression – regarded in Freud's psychoanalysis as a central defence mechanism – is a process by which a person endeavours to defend himself against painful impulses, not accepted by society, by banishing them to the unconscious.

Still another way of avoiding frustrating conflict situations is to retire within oneself, a method that seems to require less energy than the other measures mentioned here. Different forms of withdrawals are daydreaming or wool-pathening, general lack of interest and the abuse of drugs, such as alcohol.

Tutorial

In attempting to understand the behaviours of trainees, young or adults, their often surprising reactions for some and at times even aggressiveness, a session on frustration seems useful.

You may look up on the net to dig more on the causes that trigger frustration, in our case, try:

The Material Factor

i.e. How would students regard e-learning when they have a plain phone, no good connection, if not at all, etc...

The Linguistic Factor

i.e. A student starts his studies in Arabic until the end of high school, then shifts to French, receives some explanations in dialectal Arabic, but is evaluated in formal French language.

On the defence mechanisms, special stress on the main types of frustration behaviour, plus “projection” and “rationalization”.

Discussion

- How often have you witnessed violent exchanges in an exam room between teacher / student?
- What behaviour is to expect from a class when most of the students obtain less than 05/20, in their first exam at the university?
- How often did it seem to you that your teacher talks for himself and that you cannot follow?