THE EFFECT OF KNOWLEDGE OF CORRECT RESULTS PER ITEM ON VERBAL LEARNING AND RETENTION

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ABSTRACT

A report of an experiment to measure the effects of both overt and covert responses to educational stimuli with KCR (knowledge of correct results) feedback provided. In most studies of feedback, KCR (or KR) is given as a consequence of an overt response: Stimulus-Response-Feedback. In the case of a covert response, the student constructs his answer but does not react "overtly" to the presentation of a stimulus item. Forty Ss were randomly assigned to 1 of 4 groups further divided into 1 control group receiving no feedback and 3 groups receiving information (KCR) according to either overt or covert response patterns. A 25-item multiple-choice test was administered 5 times by means of a terminal consisting of a screen and a teletype. Results showed that the covert paradigm was the most effective. The experiment did not demonstrate that the covert process leads to better performance on a test administered later to measure retention. A tentative explanation for this negative result was that the time interval between the provision of feedback and presentation of the next item was of some relevance. A multiple comparison test revealed that the 3 treatment groups performed better than the control group.

1. Introduction

This paper deals with the relationship of various types of information feedback to the ability of an individual or group to assimilate and recall such information in a test. The term feedback, which in this context refers to the information which a group or individual receives relating to problems on a test, may be further categorized according to the amount of information received, the quality of the feedback, the times when the information is made available, and the type of material which is to be assimilated.

An overview of the general area of the effects of feedback on learning
can be found in J. Annett's book, *Feedback and Human Behaviour* (1969). His operational definition of feedback is knowledge of results, which may function in learning situations in three different ways: as reinforcement, as incentive, or as information. The first two functions are motivational, while the latter function is informational. Of the various theories that attempt to explain the effects of feedback on learning, reinforcement and information theories have been the most widely accepted and applied.

According to Skinner (1954), the teaching-learning situation should be constructed in such a way that the learner is frequently and immediately reinforced. The learning materials are therefore divided into an appropriate number of units called "stimulus items" to which the learner must respond. The experimenter immediately evaluates that response as either "right" (positive reinforcement) or "wrong" (negative reinforcement). According to this theory, positive reinforcement will strengthen the item-answer connection (Stimulus-Response connection). In order to maximize the successes and minimize the failures of the learners, the various stimulus items should be so organized that they contain maximum positive reinforcement and minimum negative reinforcement.

The error-correcting theories are based on the premise that the provision of information helps the learner to correct previous mistakes; according to this viewpoint, feedback must be seen primarily as the process of providing information to the learner. The efficacy of feedback is proportional to the amount of feedback that is provided, which in turn is measured according to the following scale:

1. no feedback;
2. knowledge of results (KR) — "right" or "wrong" only;
3. knowledge of correct results (KCR) — "right" or "wrong" plus the correct answer;
4. knowledge of correct results (KCR) plus explanations, additional information, etc.

As can be seen, these four types of feedback form a hierarchy. Type 1, the control condition, provides the lowest amount of feedback (no feedback) and the next three types, in ascending consecutive order, each include the previous types in the hierarchy in addition to increasing the amount and quality of feedback which is provided. Thus, Type 4 includes Type 3 plus additional information, and Type 3 includes Type 2 plus additional information.

Various studies of the validity of reinforcement theories have measured the comparative effectiveness of the various types of feedback. De Klerk (1977) conducted a study in which a multiple-choice test was administered before and after feedback; results indicated that students receiving knowledge of correct results (KCR: Type 3) had higher scores on the second test than did those students who had received only knowledge of results.