

Use of Operant Learning Principles in Measuring Behavior Changes in Pupils

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If changing pupil behavior in desired directions indicates effective teaching, then the operant studies reviewed here demonstrate that these behaviors can be measured and related to teaching behavior.

CURRENT research in operant conditioning illustrates that pupil behavior change can be used to evaluate teaching effectiveness. The systematic application of operant principles has consistently resulted in behavior changes in the desired directions.

Operant procedures have been used in classrooms to modify pupils' social and academic behavior. Madsen, Becker, and Thomas (1968) found that the systematic change in the behavior of two elementary school teachers increased "appropriate behavior" for two children in one classroom and one child in the other. A combination of ignoring "inappropriate" behavior and reinforcing appropriate behavior was effective in achieving desired behavior change in the pupils observed. Craig and Holland (1970) modified a behavior especially important for educating deaf pupils. Visual attending was modified in three classrooms of deaf pupils. All the

pupils (N=21) in these classes were involved in the study. The procedure involved the provision of "... immediate and tangible reinforcement for visual responses oriented toward the relevant teaching stimulus" (p. 98). The behavior change was measured in terms of the frequency of appropriate observed performances. All three classes increased their average frequency by 50 percent or more.

Both the studies mentioned above succeeded in modifying behavior in classrooms. Pupil behavior changes were directly measured in terms of increases or decreases in frequencies of occurrence of the particular behavior in question. Although the studies concentrated on the modification of classroom behavior problems, they probably had an indirect effect on increasing academic performance rate. If the instructional stimuli are not received by pupils, they are prevented from learning the information presented.

It is also possible to modify directly the frequency of occurrence of academic behaviors. Lovitt and Curtiss (1969) showed that higher academic behavior frequencies occurred when a pupil arranged the contingency requirements than when the teacher speci-

fied them. The contingency manager and not the amount of reinforcement was shown to be responsible for the increase in rate. Academic performance rate was increased in the areas of mathematics, reading, spelling, and writing. Lahey, McNees, and Brown (1973) increased academic performance in reading comprehension by reinforcing correct answers in children who were below grade level in reading comprehension. The percentage of correct answers increased to a level approximately comparable to children on the same grade level.

The above studies used operant procedures in classrooms and show that pupil behavior change can be used to evaluate teaching effectiveness. Teaching effectiveness, defined as the ability to generate desired behavior changes, can be directly measured. However, most studies reported the results of situations in which a few teachers (Craig and Holland, 1970; Lovitt and Curtiss, 1969; Madsen *et al.*, 1968) or an experimenter without the aid of a teacher (Lovitt and Curtiss, 1968) were involved. When teachers participated they were given considerable assistance by the experimenters. This assistance included a workshop on the basic operant principles (Madsen *et al.*, 1968), explicit directions to follow during the study (Madsen *et al.*, 1968), observation by trained observers (Craig and Holland, 1970; Madsen *et al.*, 1968), and daily feedback to the teachers concerning their behavior (Madsen *et al.*, 1968).

Follow Through in Teacher Education Programs

In general, teacher education programs present a different problem from those encountered in the operant studies presented above. Rather than a few teachers, the number involved may be considerable. The Stanford summer microteaching clinic involved 140 trainees (Fortune, Cooper, and Allen, 1967). Also, when the teachers return to their schools, they usually do not have explicit directions to follow in their classrooms (Hall, Fox, Willard, Goldsmith, Emerson, Owen, Davis, and Porcia, 1971; McKenzie,

Egner, Knight, Perelman, Schneider, and Garvin, 1970).

Hall *et al.* (1971) succeeded in training teachers to act as experimenters and primary observers in classroom attempts at behavior modification. This contrasts with studies (Hall, Lund, and Jackson, 1968; Thomas, Becker, and Armstrong, 1968) in which the teacher was neither experimenter nor primary observer. The teachers in Hall *et al.* (1971) were graduate students enrolled in a course concerning the management of classroom behavior. Various means of recording change in pupils' behavior were used. Reliability of recordings was checked by another person or a mechanical device such as a tape recorder. The class was generally successful in using the techniques, but only six out of sixty studies were reported in detail in Hall *et al.* (1971).

In Hall *et al.* (1971), teaching effectiveness was determined by the ability of the teacher to generate desired behavior change in pupils. The behavior changes were measured by recording the frequency of the particular behavior in question. A baseline record of the behavior was recorded prior to the implementation of the experimental procedures. Changes in frequencies of the behavior being altered indicated the effect of the experimental procedures. The teachers employed procedures that they designed and received feedback from their own observations of the pupils' behavior. It is implied in Hall *et al.* (1971) that the ability of the teachers in his "management of classroom behavior" course to carry out operant studies was directly related to training they had received in the course. The behavior changes that Hall *et al.* (1971) facilitated in students, which allowed them to perform their operant studies, were not reported. Another training program (McKenzie *et al.*, 1970), which used a similar method in reporting its results, differed in that the trainees did not directly modify the pupils' behavior.

McKenzie *et al.* (1970) reported on a training program for experienced elementary teachers. The teachers were trained to be consultants to other teachers in their districts on operant procedures. The teacher consul-

tants acted as experimenters and observers, but it was the teachers with whom they consulted who actually implemented the procedures. Three case studies were given. "Of the 50 handicapped learners served, 47 children demonstrated reliable and beneficial changes in behavior. . . . The remaining children showed changes in behavior too slight to be judged" (p. 139).

If changing pupil behavior in desired directions indicates effective teaching, then the operant studies demonstrate that these

behaviors can be measured and related to teaching behavior. Teachers are clearly able to demonstrate that they can facilitate learning for their pupils. It is clear that at least one method of evaluating teaching effectiveness in terms of the ability of a teacher to generate desirable behavior change in pupils is available for use. Since the studies cited in this paper all concern the application of operant learning principles, they also suggest that some teaching characteristics of effective teachers are known.

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