The Effects of Different Behavioral Definitions on Peer Recording and Observer Behavior

James T. Mecoli Jr.
Western Michigan University

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THE EFFECTS OF DIFFERENT BEHAVIORAL DEFINITIONS ON PEER RECORDING AND OBSERVER BEHAVIOR

by

James T. Mecoli Jr.

A Thesis
Submitted to the Faculty of The Graduate College in partial fulfillment of the Degree of Master of Arts

Western Michigan University
Kalamazoo, Michigan
August 1974
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James Tony Mecoli Jr.
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INTRODUCTION

Humans, as a species, have the ability to learn from others of their own kind. Methods of obtaining knowledge from the observation of others have been variously termed social learning, vicarious learning, imitation, modeling, or observational learning. Humans can learn to pattern their behavior after that of others. In general, behaving as others behave is likely to be reinforced by others.

A behavioral analysis of modeling involves a three term contingency consisting of an $S^D$ behavior by the model, an imitative response, and reinforcement of the imitated response (Skinner, 1953). Modeling develops in the history of the individual as the result of differential reinforcements. Repeated reinforcement for imitating the behavior of those who populate the child’s world eventually results in selective imitation due to differential reinforcement of such diverse behaviors as eating habits, household activities, and play patterns. The model whose behavior the child gainfully copies can become an $S^D$ for the desirable behavior. In this sense the behavior of models may serve as discriminative cues for observers in facilitating previously learned responses.

Observational learning usually occurs in the presence of the model, but it may also occur in the model’s absence by the utilization of the appropriate environmental cues.

As an individual grows older and become part of a complex social environment, reinforcement for observational learning

1
may be intermittent rather than contingent on each modeled response. This history of intermittent reinforcement leads to a general propensity in an individual to learn by observing others behave.

Modeling has been used by clinicians to effect behavior changes in many subjects. Baer, Peterson and Sherman (1967) produced generalized imitative motor responses in a retarded 12 year old girl. The young girl was able to expand a meager behavioral repertoire to include complex motor responses and varied verbal responses. Hingtgen, Coulter, and Churchill (1967) used intensive reinforcement of imitative behavior in a mute autistic child to expand his behavior repertoire to include hygienic behaviors, visits home, and simple vocal requests. Bandura, Ross, and Ross (1963) have shown that exposure of children to models engaging in aggressive behavior (both live and on film) increased aggressive behavior in the children under subsequent situations of frustration. In another study Gumm (1973) used observational learning procedures to increase on-task behavior in "poor" students who monitored models with high rates of on-task behavior. Other behaviors which have been increased through the use of vicarious learning include assisting persons in distress along a highway (Bryan & Test, 1967) and career information-seeking behavior in high school students (Krumboltz, Varenhorst, and Toresen, 1967).

One important aspect of observational learning is self-observation and reporting. Several studies have suggested that the mere act of self-observation or recording...
contributes some effect on behavior change (McFall 1970, Kanfer 1970, Johnson & White 1971, and Bolstad & Johnson 1972). Self-recording has been involved in programs to increase study time (Johnson & White, 1971), decrease talking-out (Broden, Hall, and Mitts, 1971), and to decrease smoking behavior (McFall, 1970). Tharp and Wetzel (1969) have reported that seven percent of the cases involved in their Behavior Research Project resulted in successful intervention due only to the behavior being observed and recorded. Similarly, Duncan (1969) reported that of 2000 behavior modification projects involving high school seniors five percent achieved success simply by recording behavior frequency. Bolstad and Johnson (1972) found that teaching grade school children to self-observe their own behavior was a more effective modification process than a procedure involving independent observers modifying student behavior.

Other studies have shown that self-observation procedures were ineffective methods of producing behavior change in the individual-observer. Fixen, Phillips, and Wolf (1972) investigated the reliability of self-reporting and peer-reporting and its effects on behavior on boys in a residential home setting. In two experiments there was no systematic effect on room cleaning behavior. Santogrossi, O'Leary, Romanczyk, and Kaufman (1973) had nine adolescent boys in a psychiatric hospital school rate their own behavior as to classroom appropriateness. The self-evaluations did not lead to a reduction of disruptive behavior.
The direct measureable effects of self-recording on the target behavior in these studies is confounded by other variables in the studies, principally varying reward and punishment procedures. It can be seen that self-observation and recording don't always contribute to the desired behavior change. Self-observation procedures employed in behavior modification programs are sometimes active, sometimes ineffective variables with regard to producing individual behavior change.

Kanfer & Phillips (1970) and Hill (1960) raise the potential of modeling for the transmission of behavior which is especially important in the development of a child's standards for evaluation of his own achievements and establishment of moral judgement. The failure of self-recording procedures to modify behavior may have resulted from these individuals having no prior exposure to the desired behavior or they may have had poor models against which to judge their own performance. That is, they have no satisfactory means of gauging their behavior by any acceptable standards. The importance of vicarious learning procedures for changing self-reaction is evident here. If we provide these individuals with models to observe, they would have an opportunity to measure behavior and develop standards of evaluation. Once exposed to the desired behavior of the model, they would be better able to judge and correct their own behavior.

School systems provide one setting in which children are expected to maintain a measure of orderly behavior.
Yet, schools are filled with "problem" students who generally exhibit low rates of appropriate classroom behavior. They are often rowdy, fail to complete their assignments, bother the other children and in general are an obstacle to a smooth running classroom. Yet, these students are able at times to function adequately and behave desirably in the classroom. This proportion of undesirable to desirable classroom behavior can be altered by the use of behavior control techniques. While behavior modification procedures have been used successfully in many classroom situations, they have principally involved adult control of the child's behavior. In the Hall, Cristler, Cranston and Tucker (1970) study the teacher acted as both experimenter and observer. In one portion of the procedure the teacher effectively modified tardy behavior of her students by using inclusion on a patriots chart as a reward for being on time. Madsen, Becker, and Thomas (1968) successfully had teachers observe and modify the behavior of children showing a high frequency of problem behaviors using a variety of experimental procedures including giving the child a set of rules, stating the rules and ignoring inappropriate behavior, and in addition to these procedures, praise for appropriate behavior. Sulzbacher and Houser (1966) had the teacher use a group contingent loss of recess time to reduce classroom disruptions. Osborne (1969) successfully decreased out-of-seat responses by having the teacher institute a contingent free time period for in-seat responses. These
studies indicate that teachers could modify the behavior of problem students by observation and environmental manipulation, however, there are times when the procedures used are not practical in the ordinary classroom setting. Examples include times when a teacher is unable to attend to an entire class while working with an individual or a small group. Furthermore a teacher may not possess the skills to deal with specific problem children. Because the cost of hiring special personnel is prohibitive, many problem children don't get the help they need.

One possible method by which modification of a child's behavior may take place is through the use of other students in the classroom. Suratt, Ulrich, and Hawkins (1969) have shown that fifth grade student could effectively monitor and modify the study behavior of four first grade children. In another study, Gumm (1973) used observational learning to effect desired behavior change in grade school children. Student observers were told to watch and record the behavior of peer models who demonstrated high levels of appropriate classroom behavior. They were not told to imitate them, but only to observe and record as part of a university project. The procedure resulted in an initial positive shift in the observer's on-task classroom behavior. Thus, it may be useful to have students observe and record the behavior of other children, when it is impractical for the teacher to observe, record, and execute the manipulations.

One possible confounding variable involved in an
observational learning situation is increased teacher reinforcement of the model or observer. In this regard the teacher vicariously reinforces the observer. Kazdin (1973) showed that contingent teacher reinforcement of attentive behavior in a target subject increased that behavior in an adjacent peer. This teacher reinforcement mediated through a model can produce a change in the behavior of a student that observes the behavior of the model. Gumm (1973) demonstrated an increase in observer on-task behavior after watching a model, although he found no increase in contingent teacher reinforcement of the model. He recorded the level of teacher interaction with the model and found it stable and in general of low frequency throughout the entire study. This indicates that the change in observer behavior which he found may be due to modeling rather than vicarious reinforcement mediated through the model. He also concluded that peer recording is a reactive measure which initiates increased on-task behavior in the observer.

The present study is an extension of Gumm's (1973) study concerning peer recording and its effects on observer behavior. The purpose of the study is to investigate the cueing properties of the observation and recording procedures used by student recorders in observing the behavior of a student model. This study sought to determine if there were any differential effects on observer behavior due to his focusing on either the on-task behavior of the model or the off-task behavior of the model. Another procedure involved
focusing on the location of the model in the classroom rather than his behavior in order to examine other parameters of observation and recording procedures. This study sought to answer these questions. What properties of peer observation and recording procedures affect observer behavior and in what direction do they affect observer behavior?
METHOD

Subjects And Setting

Eight junior high school students comprised the subjects for this study. They were enrolled at South Junior High School in the Kalamazoo School District. This is an intermediate school of about 700 students, situated in a moderately industrial urban setting. This setting provided regular class sessions five days a week divided into one hour time blocks.

Students were chosen for the study on the basis of teacher recommendations and pre-baseline on-task behavior measures by the Study Coordinator. The subjects were selected for their "poor" classroom and study behavior. They often engaged in behaviors which interfered with their assigned tasks, such as day-dreaming, talking to other students or wandering about the room. The models on the other hand were chosen because they generally exhibited "good" classroom behavior and study habits and rarely displayed behaviors which interfered with their work. The eight students involved were linked in two Subject_1- Subject_2- Subject_3- Model (S-M) sets, one set from each of the two (A,B) seventh grade classes participating. Table I shows the age and sex of each of the students. Each of the S-M set members were seated so that the students weren't adjacent to one another, but were within complete view of one another.
Table I
Student characteristics arranged in S–M sets.

<table>
<thead>
<tr>
<th>Classroom</th>
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<td>A</td>
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<td>Female</td>
</tr>
<tr>
<td></td>
<td>Subject₂</td>
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<td>Male</td>
</tr>
<tr>
<td></td>
<td>Subject₃</td>
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<td>Male</td>
</tr>
<tr>
<td></td>
<td>Model</td>
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<td>Male</td>
</tr>
<tr>
<td>B</td>
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</tr>
<tr>
<td></td>
<td>Subject₂</td>
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<td>Female</td>
</tr>
<tr>
<td></td>
<td>Subject₃</td>
<td>12</td>
<td>Female</td>
</tr>
<tr>
<td></td>
<td>Model</td>
<td>12</td>
<td>Female</td>
</tr>
</tbody>
</table>

Overview Of Design

A multiple baseline design (Baer, Wolf, and Risley, 1968) was used to discern the effect of the experimental variable in this study. The variation of the multiple baseline which was used (Hall, Cristler, Cranston and Tucker, 1970; Hall, 1971) is one in which a single class of behaviors (on-task) are recorded for several subjects. The conditions were applied in succession to each of the S–M sets. (See Fig. I).

The sequence involved three experimental conditions:

Baseline: define and record the operant level of the target behaviors prior to the application of the experimental variable.

Condition 1: institution of the experimental conditions while recording target behavior reactions.
FIGURE I: Design Layout

Days

<table>
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<th></th>
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<th>5</th>
<th>10</th>
<th>15</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>S₁</td>
<td>B</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>S₂</td>
<td>B</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>S₃</td>
<td>B</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

Classroom A

<table>
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<th>5</th>
<th>10</th>
<th>15</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>S₁</td>
<td>B</td>
<td>B</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>S₂</td>
<td>B</td>
<td>B</td>
<td>-</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>S₃</td>
<td>B</td>
<td>B</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

Classroom B

Key:  
B : baseline  
+: observes M, records on-task behavior  
- : observes M, records off-task behavior  
x : observes M, records if he is in his seat
Condition 2: a reversal of condition 1 variables and continued recording of target behavior reactions. Each of the S-M sets was exposed to the same set of conditions, but they each began at a different time.

Observation

**Definitions:** The first step was to define the target behaviors, which constituted the dependent variable. Gumm's (1973) definitions served as the basis for the following operational definition.

On-task behavior was defined as the proportion of 15 second intervals during which the student (S) was engaged in one of the following behaviors:

1. looking at book, paper, or blackboard
2. reading
3. writing
4. ask the teacher a question
5. remaining at desk; except with the teacher's permission, to ask the teacher a question, sharpen a pencil, or to obtain necessary materials.

On-task behaviors for a student working in a group with the teacher were defined as:

1. looking at teacher
2. looking at blackboard
3. taking part in oral discussion.

This definition was chosen because it details individual behaviors appropriate to group work rather than those appropriate
to individual desk work. Off-task behavior was defined as:

1. talking to another student without permission
2. looking out the window
3. looking around the room
4. walking "aimlessly" around the room
5. sitting with eyes closed.

It is possible for the student to remain at his desk and engage in off-task behaviors, such as talking to another student or looking around the room. Merely being seated doesn't constitute an on-task behavior, the subject must be engaged in an on-task activity.

Assessment: The study took place during the first two hours of the day, between 8:00-10:00 A.M., five days a week. Observations were conducted for each S-M set for one half an hour period each day. The half hour period for Classroom A was during the first hour of the day form 8:15-8:45 A.M.. Classroom B was observed for half an hour during the second period form 9:15-9:45 A.M.. The middle portion of the period was used as the observation interval in order to avoid the restlessness of the class in settling down to work at the beginning of the hour or in anticipating their departure at the end of the period. Each set was observed for half an hour each day by an independent observer seated in the back of the classroom.

A time sampling technique (Hall, 1971) was used to collect the data on the S-M sets. The 30 minute observation period was divided into fifteen 2 minute intervals. These
intervals were further divided into four 30 second segments (See Fig. II); one for each member of the set. The first fifteen seconds of each interval were used to observe subject1, followed by 15 seconds to record his behavior and search for the next student. A similar procedure was used for the remaining 90 seconds of each interval and subject2, subject3, and the model.

The behaviors observed were categorized as on-task or off-task for each student (see operational definitions). To meet the on-task criterion the child had to be working for the entire 15 second observation interval (a + was scored for the interval). Behavior was scored as off-task (-) for the interval if the child didn't meet the above requirements.

Data was recorded on sheets with 15 rows of four squares, each row representing the passage of a 2 minute interval. (See Appendix B). Each square represented a 15 second observation and 15 second recording segment, a total of 30 seconds. A (+) or (-) in each square indicated on-task or off-task behavior performance for the student.

Reliability: Reliability checks were made at least twice during each condition for each of the S-M set members. The study coordinator was the second observer and recorded the behavior of the S-M set members for the reliability checks. In the classroom the observers were seated far enough apart to eliminate looking at one another's data, but they had an equal unimpeded opportunity to view the students in
FIGURE II

Layout of two minute interval time sample procedure

<table>
<thead>
<tr>
<th>Time/Minutes</th>
<th>Time/Seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Observe</td>
<td>15</td>
</tr>
<tr>
<td>S1</td>
<td>Seek S1</td>
</tr>
<tr>
<td></td>
<td>S2</td>
</tr>
<tr>
<td></td>
<td>Seek S2</td>
</tr>
<tr>
<td>1</td>
<td>30</td>
</tr>
<tr>
<td>Observe</td>
<td>45</td>
</tr>
<tr>
<td>S2</td>
<td>Seek S2</td>
</tr>
<tr>
<td></td>
<td>S3</td>
</tr>
<tr>
<td></td>
<td>Seek S3</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
</tr>
<tr>
<td>Observe</td>
<td>75</td>
</tr>
<tr>
<td>S3</td>
<td>Seek S3</td>
</tr>
<tr>
<td></td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Seek S1</td>
</tr>
</tbody>
</table>

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each S-M set.

In this study, reliability was calculated by an interval method. The observers scored all the intervals during the observational time periods as either (+) or (-). A plus indicated that the subject met the criteria for on-task behavior for that interval; a minus showed that he didn't meet the criteria. Reliability was calculated by comparing the data sheets of the observers and study coordinator. Each interval was scored as agree or disagree and the total number of agreements was divided by the number of agreements plus the number of disagreements, and then multiplied by 100 to obtain a percentage.

In this study there was one observer for each student set. The observers were given one training session in which to familiarize themselves with the recording technique and to memorize the behavioral definitions. They then had four sessions in the classrooms to gain observing skill and provide an opportunity for the teacher and students to get used to their presence. Before each session the observers were reminded of the operational definitions of on-task and off-task behaviors.

Procedure And Experimental Conditions

Each set of subjects was exposed to the same order of experimental phases. However the phases began at different periods for each group (See Figure I).

The study lasted for 19 sessions over a period of five
weeks. All the sessions were conducted during the daily mathematics classes for both classroom A and B. Both classrooms had the same teacher. During the first hour members of classroom A worked on programmed learning materials, with the teacher handing out materials, checking progress, and answering questions when asked. Classroom B had a more traditional classroom structure with the teacher giving a short lecture explanation of some new material and then assigning a work exercise to be completed individually at the student's desk.

The teacher was not told when any of the conditions began and was uninformed as to the goals of the study. The teacher didn't participate in any way except to conduct class as usual.

**Baseline.** On-task behavior was recorded for 5 days for each child in classroom A and for 8 days in classroom B. The classes involved were told by their teacher that they were to be part of a university project, and that they may be asked to help in it by the study coordinator. The S-M set members were not made aware of their specific participation until the experimental conditions.

**Condition 1.** At the beginning of this phase the study coordinator explained and defined "studying" (on-task) and "not studying" (off-task) behavior definitions to subject_1 and subject_2 (See Appendix A). Subject_1 and subject_2 were told to observe and record the behavior of the model every five minutes by the classroom clock. Data sheets consisted of a single row of seven squares labeled at five minute intervals (See Appendix C). The sheets were provided for the subjects.
each day at which time they were reminded of what they were recording by the study coordinator. The subjects recorded under a different phase during each condition.

The cue to on-task phase. During condition 1 subject 1 observed the model every five minutes. He was told to observe and record the on-task behavior of the model. If the model's behavior met the "studying" criteria then subject 1 recorded an (x) on his data sheet. If the model didn't meet the on-task behavior definition in the judgment of the subject, then he left a blank in the appropriate spot on his data sheet.

The cue to off-task phase. During condition 1 subject 2 observed the model every five minutes for 30 minutes. Subject 2 was told to observe and record the off-task behavior of the model. If the model's behavior met the "not studying" behavioral definition, then subject 2 recorded an (x) on his data sheet. If the model didn't meet the off-task criteria, then the subject left the square blank in the appropriate spot on his data sheet.

During the first condition subject 1 recorded on-task behavior of the model and subject 2 observed and recorded off-task behavior of the model at the designated five minute marks. Since they were observing the model and recording at the same time, their data sheet records should have been essentially reciprocal.

The cue to the model's whereabouts phase. Subject 3 was the only subject to work under this phase. This phase was a control procedure for the cue to on-task and cue to
off-task procedures. Subject$_3$ was not informed of the on-task and off-task behavior definitions as were subject$_1$ and subject$_2$. His instructions were to observe and record whether the model was or was not in his seat at the designated five minute mark. Subject$_3$ was provided with the same style data sheets as subject$_1$ and subject$_2$. If the model was in his seat, he marked an (x) on his sheet; he left the appropriate interval blank if the model was not in his seat at the time of his five minute check.

**Condition 2.** During this second experimental condition the roles of subject$_1$ and subject$_2$ were reversed. Subject$_1$ observed and recorded "not studying" behavior of the model under the cue to off-task procedure. Subject$_2$ worked under the cue to on-task procedure and observed and recorded "studying" behavior of the model. Subject$_3$'s role was not changed and they continued to observe whether or not the model was in his seat under the cue to the model's whereabouts procedure.

It was explained by the study coordinator to each subject that money would be available contingent on their recording behavior (observing and marking their data sheets at the appropriate times). They were paid 10 cents per session for observing and marking the squares at the proper time; 5 cents for observing and recording but not at the appropriate time (ie. not at the five minute marks), and no money was paid if they did not observe and record at all. The reinforcement was only used to maintain appropriate observing and
recording behavior. There was no reinforcement provided for on-task improvement by the students during the study. The money reinforcement was available only at the end of the hour when the data sheets were turned in. The subjects were reinforced for participating in the study, but not contingently for any change in their levels of on-task performance. The study coordinator checked the accuracy of the subjects' recording behavior.
RESULTS

Reliability

Reliability for on-task behavior across subjects ranged from 46% to 100% (mean = 92%). Reliability was obtained for each subject by comparing the interval scores on the data sheets of two independent observers in each classroom. It was calculated by dividing the total number of agreements by the number of agreements plus the number of disagreements and then multiplying by 100 to get a percentage. Table II details the mean interobserver reliability for each subject under each condition.

Table II

Average interobserver reliabilities during baseline and experimental conditions.

<table>
<thead>
<tr>
<th>Classroom</th>
<th>Baseline</th>
<th></th>
<th></th>
<th>Experimental</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% of agreement</td>
<td># of checks</td>
<td>% of agreement</td>
<td># of checks</td>
<td>% of agreement</td>
<td># of checks</td>
</tr>
<tr>
<td>A</td>
<td>S₁</td>
<td>82</td>
<td>4</td>
<td>93</td>
<td>6</td>
<td>91</td>
</tr>
<tr>
<td></td>
<td>S₂</td>
<td>93</td>
<td>4</td>
<td>92</td>
<td>6</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>S₃</td>
<td>89</td>
<td>3</td>
<td>92</td>
<td>6</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>91</td>
<td>4</td>
<td>86</td>
<td>5</td>
<td>95</td>
</tr>
<tr>
<td>B</td>
<td>S₁</td>
<td>96</td>
<td>6</td>
<td>95</td>
<td>3</td>
<td>93</td>
</tr>
<tr>
<td></td>
<td>S₂</td>
<td>96</td>
<td>6</td>
<td>88</td>
<td>3</td>
<td>88</td>
</tr>
<tr>
<td></td>
<td>S₃</td>
<td>92</td>
<td>6</td>
<td>88</td>
<td>3</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>94</td>
<td>5</td>
<td>86</td>
<td>3</td>
<td>95</td>
</tr>
</tbody>
</table>
The reliability percentages show no differential subject measurement by the observers. The mean interobserver reliability for each subject during the experimental conditions never fell below 82%.

Experimental Conditions

Figure III represents the percentage of intervals per session in which the subjects met the on-task criteria. The subjects are compared by recording role across classrooms. The models, not shown, generally exhibited a stable and consistent high percentage of on-task behavior throughout all the conditions. In classroom A the model's performance ranged from 73% to 100% with a mean of 88.3%. The model in classroom B had an on-task performance which ranged from 80% to 100% with a mean of 93%.

**Classroom A.** During baseline subject_1_ had a mean percent of on-task behavior per session of 40.6%. During condition 1, when subject_1_ began recording on-task behavior, the subject's percent of on-task behavior rose to a mean of 67.6%. When condition 2 started and subject_1_ was recording off-task behavior, subject_1_'s percent of on-task behavior rose still higher to a mean of 83.5%.

During baseline subject_2_ scored a mean percent of on-task behavior of 44.7%. In the first session of condition 1, subject_2_‘s percent of on-task behavior increased by 40% over the previous baseline session. During condition 1 while recording off-task behavior, subject_2_ showed a mean of 75.0%
FIGURE III

Percent of on-task behavior for each subject in classrooms A and B for each experimental condition.
for on-task behaviors. Under condition 2, while recording on-task behavior of the model, the mean percent of on-task behavior decreased slightly to 72.0%, with an initial increase at the start of the condition and then a gradual decrease toward the end.

Subject_3 had a baseline mean percent of on-task behavior of 37.2%. During both condition 1 and condition 2, subject_3 was under the cue to the model's whereabouts procedure. Subject_3 had a mean percent of on-task behavior of 32.4% in condition 1 and 32.1% for condition 2. Subject_3's on-task behavior fluctuated widely over a range of 00.0% to 66.6% during the entire study. Though generally stable, as can be seen in Figure III, his on-task behavior would dramatically peak or fall around the mean on a given day. The procedure did not affect his behavior in the classroom.

Classroom B. During baseline, subject_1 had a mean percent of on-task behavior of 19.9%. In condition 1, subject_1's percent on on-task behavior rose then fell, before substantially increasing in the third session to 94%. Subject_1 had a mean of 76.4% on-task behavior during condition 1 in which subject_1 recorded on-task behavior of the model. In condition 2, when subject_1 recorded off-task behavior of the model, subject_1's mean percent of on-task behavior increased to 81.7%.

Subject_2 had a mean percent of on-task behavior of 56.5% during baseline, ranging from 33% to 80%. During condition 1 in which subject_2 recorded off-task behavior of the model, subject_2's own percent on-task behavior increased to a mean
of 85.0%. During condition 2, subject₂'s mean percent of on-task behavior fell slightly to 78.0%, though this figure is still well above the baseline mean of 56.5%.

Subject₃ scored a mean percent of on-task behavior of 55.7% during baseline. As in classroom A, subject₃ recorded whether or not the model was in his seat during both condition 1 and condition 2, subject₃ had a sharp rise in mean percent of on-task behavior in condition 1 to 76.4%. Subject₃'s scores peaked during condition 1 in sessions 12 and 13 with marks of 94% for on-task behavior. After this peak, subject₃'s on-task behavior gradually decreased. This decline continued through condition 2 during which subject₃ had a mean percent of on-task behavior of 60.0%.

Table III shows the mean scores for all the members of each S-M set under all the conditions. Both models had a high mean percentage of on-task behavior throughout all of the conditions. Both of the subjects₁ followed a similar pattern of increased percentage of on-task behavior during condition 1, followed by an even higher percentage during condition 2. The subjects₂ followed a pattern of on-task behavior during condition 1 (when they recorded off-task), followed by a slightly lower percentage of on-task behavior in condition 2 (when they recorded on-task). This lower mean percentage in condition 2 still remained substantially above the baseline measures. The subjects₃ show no similar pattern; in classroom A, subject₃'s percent of on-task behavior remained
nearly the same throughout all the conditions, while in classroom B, subject_3's percent of on-task behavior increased in condition 1 before gradually falling off during condition 2.

Table III

Mean percent of on-task behavior of the subjects for each of the experimental conditions.

<table>
<thead>
<tr>
<th>Classroom</th>
<th>Baseline</th>
<th>Condition 1</th>
<th>Condition 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S_1</td>
<td>40.6%</td>
<td>67.6%</td>
<td>83.5%</td>
</tr>
<tr>
<td>S_2</td>
<td>44.7%</td>
<td>75.0%</td>
<td>72.0%</td>
</tr>
<tr>
<td>S_3</td>
<td>37.2%</td>
<td>32.4%</td>
<td>32.1%</td>
</tr>
<tr>
<td>M</td>
<td>88.5%</td>
<td>89.3%</td>
<td>87.0%</td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S_1</td>
<td>19.9%</td>
<td>76.4%</td>
<td>81.7%</td>
</tr>
<tr>
<td>S_2</td>
<td>56.5%</td>
<td>85.0%</td>
<td>78.0%</td>
</tr>
<tr>
<td>S_3</td>
<td>55.7%</td>
<td>87.0%</td>
<td>60.0%</td>
</tr>
<tr>
<td>M</td>
<td>91.3%</td>
<td>90.0%</td>
<td>97.0%</td>
</tr>
</tbody>
</table>

Each of the subjects in both S-M sets earned money contingent upon observing and recording the model's behavior at the appropriate 5 minute marks. In classroom A, subject_1 earned $1.40 (14 sessions), subject_2 earned $1.35 (14 sessions) and subject_3 received $1.15 (13 sessions). In classroom B, subject_1 received $1.10 (11 sessions), subject_2 earned $1.00 (10 sessions), and subject_3 earned $1.00 (10 sessions). The subjects had no sessions in which they failed to earn some money, except subject_3 in classroom A, who received no pay for session 10, because he left without turning in his data sheet for the day.
DISCUSSION

The results of this study indicate that there is no differential effect on observer-recorder behavior due to focusing on either the on-task behavior or the off-task behavior of a model. Under both orientations the behavior of the observer came to more closely approximate the high rate on-task behavior of the student model. The results also demonstrate that a general observation of the model's whereabouts without behavioral definitions did not lead to a consistent behavior change in the observer. This indicates that instructions to the subjects should include some form of behavioral definition (positive or negative) in order to gain a consistent increase in on-task behavior of the observer-recorder.

This present study principally supported the findings of Gumm (1973), that observing and recording of a model by peers is a reactive process, leading to behavior in the recorder which closer approximates that of the model. Gumm mentioned model characteristics as a possible alternative explanation for the subjects behavior change. The models possessed desirable traits such as intelligence, good grades, and friends which anyone in the class could have properly emulated. This emulation could have been responsible for the behavior change. Related to this subject of model characteristics Gumm also pointed out that the mixed use of both male and female subjects and models, did not seem to affect the outcome of the study.
The present study corroborates this finding with the results demonstrating improved percent of on-task behavior for male and female subjects using both a male model (classroom A) and a female model (classroom B). This study also used subjects who were from 2-4 years older than those recruited by Gumm, with the same measurable success, indicating that observing and recording the behavior of a peer model is still a reactive process in older children which led in this case to improved on-task behavior in the observer-recorder.

In connection with this area of model characteristics, this study used a racially mixed group of subjects and models. In classroom A, the model and subject₁ were black, while subject₂ and subject₃ were white. In classroom B, subject₁, subject₃, and the model were white, while subject₂ was black. These racial characteristics appeared to play no significant part in the results. At this age, black and white models seem to serve equally well for black and white observer-recorders. Further research in this area of subject characteristics and observer-recorder effects, perhaps using older and racially mixed subjects in different settings, would prove to be useful.

It must also be noted that in this study, the models demonstrated consistently high rates of on-task behavior, while they were observed by students with average or low rates of on-task behavior. The cueing function of the procedures and definitions was to orientate the subject's frame of reference when observing the model to a specific view of the
model either on-task or off-task. That is, while the subjects were observing the same model and behavior, one was observing the model looking for on-task behavior, the other was looking for off-task behavior. Most of the time they both saw on-task behavior in the high rate models. It would be interesting to see if the same effects (improved on-task behavior in the observer-recorder) could be obtained using a low-rate model. Thus mitigating the necessity of a high rate model and further enhancing the cue function of observer-recorder effects.

Several other interpretations of the results are possible. The increase in on-task behavior of the subjects could be a reciprocal function of a reduction in off-task behavior. Though the subjects were not adjacent to one another in the classroom, it is possible that the absence of or the increased on-task behavior of their immediate neighbors may have led to a general reduction of distractions for the classroom and the subjects and thus have resulted in a decrease in off-task behavior. This systematic increase in the subjects' adjacent seatmates' on-task behavior necessary to sustain the on-task behavior change in the subjects is unlikely, but the behavior and absences of adjacent students were not recorded and thus the possibility remains.

Another possible interpretation for the increase in on-task behavior in the observer-recorder is provided by Kazdin (1973), who suggested that increased teacher attention toward the model vicariously reinforced the observer. Teacher
contacts and attention toward the S-M set members were not recorded in this study because it was felt that Gumm (1973) effectively demonstrated that teacher reinforcement of the model did not seem to be a variable mediating observer-recorder behavior change. The teachers in Gumm's study were informed as to the nature of the study and when each condition began. This information necessitated the monitoring and recording of teacher behavior toward the students. The data showed that observer-recorder behavior changed even though the teacher directed minimal social reinforcement towards either the subjects or models. In the present study teacher attentive behavior was a possible confounding variable. It was controlled for because the teacher was uninformed as to the procedures and goals of the study. She was unaware of the specific students involved as S-M set members and had no direct knowledge of when each individual experimental condition started or finished. In addition to these steps, general observation by the study coordinator showed no change in the teacher's classroom behavior.

A still different interpretation would attribute the change in behavior to the observing and recording process in and of themselves. That is perhaps the recording procedure served only as an S_D for appropriate behavior in the subject, rather than the behavior of the model. This historical variable involving the subjects past experience with on-task and off-task behavior definitions and reinforcement patterns could be a confounding factor accounting for some of the observed
behavior change.

A final interpretation for the subjects' on-task behavior increase could be the so-called "Hawthorne effect". This explanation suggests that the knowledge of being in a research project and being singled out for participation may effect a behavior change in the individual. This may in fact have accounted for the unexpected increase in classroom of subject 3's on-task behavior in condition 1. In subject 3's role as a control subject, recording the model's in-seat behavior wasn't expected to affect her level of on-task behavior. Another explanation for subject 3's behavior change may lie in the definition given under the cue to the whereabouts procedure. The subjects recorded whether or not the model was in his seat, and though being in their seat was not required for on-task behavior, it may have provided subject 3 with a vague semblance of an on-task definition resulting in an increased on-task behavior performance. These results by this interpretation support our other findings. This performance wasn't maintained, with subject 3 showing a decline in on-task performance over the remainder of condition 1 and into condition 2. A better procedure would have been to have the subjects find the model and write down his location in the room, but for the purposes of this study it was felt that subject 3 should use the same recording procedure and data sheet as the other subjects and this was facilitated by recording the model's location as in-seat (x) or out-of-seat (blank), a yes or no proposition.
The study was conducted using a single organism design. In the study there was no consequation of the individual subject behavior, but rather there was a change in the social conditions surrounding these students in the classroom. The results show consistent increases in observer-recorder on-task behavior, individual subject differences could account for fluctuations and differential levels of the scores.

The performance of subject 3 in classroom B provides an example of such individual variation. The results, in spite of these individual subject differences, are consistently uniform and encouraging for the use of such a procedure in the classroom.

The study shows that certain peer-recording procedures can be used to modify observer-recorder behavior. The students given specific behavioral definitions showed a consistently higher level of on-task behavior than those who observed the model from a general frame of reference. Whether the student was given a positive or negative behavioral definition didn't seem to matter, a definition was sufficient to provide them with some standards for the evaluation of the model's behavior and apparent appraisal of their own. At the conclusion of the study the levels of on-task behavior seemed to be leveling off in some instances and falling off in others, perhaps because no contingent reinforcement for their on-task behavior improvement was forthcoming. Teachers could use the procedure for initiating desirable levels of appropriate behavior to a point where they could reinforce desired
with attention, praise, grades, or other reinforcers available in the classroom. The results indicate that the teacher could effectively employ the procedures used in the study. They provide a practical, easily employed method of modifying student behavior, both for the teacher's and the student's benefit.
APPENDIX A

Study Coordinator Instructions To Subject₁ and Subject₂

At the beginning of experimental condition 1, the study coordinator contacted subject₁ and subject₂, and he explained on-task (studying) and off-task (not studying) behavior definitions and recording procedures to them.

The subject was given a data sheet each class session with one row of 7 squares with each square representing five minutes. When the subject was under the cue to on-task procedure he was told to look at the model and mark down an (x) if the model was "studying" and leave it blank if he was not. When the subject was under the cue to off-task procedure he was told to look at the model and mark down an (x) if the model was "not studying" and leave it blank if he was. Each subject used the large wall clock in each classroom to determine the five minute intervals. Various aspects of "studying" and "not studying" were discussed at this time and the following definitions were given to them:

**Studying:** A student is studying, if he is at his desk: looking at a book, paper or the blackboard. A student is studying if he is reading, or writing. A student is studying if he is out of his seat and asking the teacher a question, sharpening his pencil, or getting materials.

**Not Studying** A student is not studying if he is out of his seat wandering around the room. He is not studying when he is in his seat gazing...
out the window, looking around the room, sitting with his eyes closed, or if he is talking to another student without permission. The subjects observed and recorded only every five minutes so as not to interfere with their own work. The models were not informed of the experimental conditions and subjects were instructed not to tell any of their classmates of their specific participation in the study.
APPENDIX B

Independent Observer Data Sheet

CLASS: A

\begin{array}{cccc}
1 & 2 & 3 & M \\
\hline \\
1 & 2 & 3 & 4 \\
5 & 6 & 7 & 8 \\
9 & 10 & 11 & 12 \\
13 & 14 & 15 & 16 \\
17 & 18 & 19 & 20 \\
21 & 22 & 23 & 24 \\
25 & 26 & 27 & 28 \\
29 & 30 & & \\
\end{array}

CLASS: B

\begin{array}{cccc}
1 & 2 & 3 & M \\
\hline \\
1 & 2 & 3 & 4 \\
5 & 6 & 7 & 8 \\
9 & 10 & 11 & 12 \\
13 & 14 & 15 & 16 \\
17 & 18 & 19 & 20 \\
21 & 22 & 23 & 24 \\
25 & 26 & 27 & 28 \\
29 & 30 & & \\
\end{array}
APPENDIX C

Student Data Sheet

Subjects marked the squares (x) if they observed the requisite behavior. If the subject didn't see the right type of behavior, he left the square blank. Data sheets were turned in to the study coordinator at the end of each session.
REFERENCES


