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EFFECTS OF TEACHER MODELING ON THE SUBSEQUENT BEHAVIOR OF STUDENTS

DISSERTATION

Presented in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy in the Graduate School of The Ohio State University

By
Wayne Lee Westcott, B.S., M.S.

* * * * *

The Ohio State University 1977

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CHAPTER I

INTRODUCTION AND STATEMENT OF PROBLEM

Behavior can often be accounted for by the principles of operant conditioning. Responses which are positively reinforced tend to increase in strength and frequency of occurrence, whereas responses which are punished tend to decrease in strength and frequency of occurrence. However, while operant conditioning procedures are effective for controlling existing responses, they may be quite inefficient for producing new behaviors. In such cases, it seems that learning can be facilitated through the observation of responses performed by other persons. According to Bandura (1965a), "... the process of learning can be considerably shortened and accelerated by the provision of models" (p. 314). Modeling techniques have in fact been shown to: (1) elicit new behaviors from an observer (modeling effect); (2) increase or decrease an observer's tendency to avoid a specific behavior (inhibitory/disinhibitory effects); and (3) prompt an observer to perform a familiar response (response facilitation effect).
Although most of the research on modeling behavior has been undertaken by psychologists away from educational settings, there is reason to believe that modeling procedures are as effective in classrooms and playing fields as they are in any other environment. For example, the results of an experiment by Bryan and Walbek (1970) demonstrated that what a model does has a greater affect on children's behavior than what a model recommends for them to do. Clearly, this aspect of modeling would seem highly relevant to teaching and coaching situations. Rosenhan and White's (1967) finding that exposure to an altruistic adult model increases altruistic behavior in children also appears to be generalizable to teacher-student relationships.

In general, educators concur that teachers do indeed present models for behavior which their students tend to imitate (Gage, 1972; Dunkin and Biddle, 1974; Glavin, 1974; Fuller and Bown, 1975). Williams and Anandam (1973) believe that the teacher typically has a stronger modeling influence than student peers, and Good and Brophy (1973) contend that any behavior (desirable or undesirable) exhibited by the teacher is apt to be imitated by the students. Siedentop (1976) submits that it is important for physical educators and coaches to model behaviors such as good health habits and good sportsmanship because students and athletes are likely to follow their example.
While conventional wisdom assures us that modeling undoubtedly plays a prominent role in the process of student learning, there is actually very little field-based (i.e., classroom, gymnasium, or playing field) research to substantiate this hypothesis. One of the few classroom studies of the modeling process was performed by Csapo (1972). His research on peer modeling revealed that the behavior of elementary school students can have a significant influence on the actions of their classmates. In another school-related investigation of modeling behavior, Zevin (1974) found that student teachers tend to imitate the instructional style of their cooperating teacher regardless of incentives to do otherwise. However, there is little direct evidence that the behaviors modeled by teachers are subsequently acquired by their students. The object of this study, therefore, was to determine whether specific behaviors modeled by teachers are subsequently exhibited by their students.

**Statement of Problem**

The fundamental purpose of this study was to determine whether teacher modeling was an effective means for attaining specific educational objectives with elementary students in physical education settings. The investigation consisted of three separate modeling experiments. It
was the purpose of the first experiment to discover whether:

1. Teacher modeling was an effective means for increasing the rate of student encouragement in group settings.
2. Teacher modeling plus prompting was more effective than teacher modeling alone for increasing the rate of student encouragement in group settings.

It was the purpose of the second experiment to discover whether:

1. Teacher modeling was an effective means for increasing the rate of student encouragement to low-skilled individuals in group settings.
2. Teacher modeling plus prompting was more effective than teacher modeling alone for increasing the rate of student encouragement to low-skilled individuals in group settings.

It was the purpose of the third experiment to discover whether:

1. Teacher modeling was an effective means for increasing the rate of student instruction to low-skilled individuals in tutorial settings.
2. Teacher modeling was an effective means for increasing the rate of student encouragement to low-skilled individuals in tutorial settings.
3. Teacher modeling plus prompting was more effective than teacher modeling alone for increasing the rate of student encouragement to low-skilled individuals in tutorial settings.

A sub-problem of this investigation for all three experiments was to determine whether students of one sex exhibited more teacher-matching behavior than students of the other sex. Another sub-problem was to determine whether older children imitated the teacher's behavior to a greater degree than younger children.

**Hypotheses**

The following hypotheses were formulated on the basis of the available modeling literature. With regard to the first experiment it was hypothesized that:

1. Teacher modeling would be an effective means for increasing the rate of student encouragement in group settings.

2. Teacher modeling plus prompting would be more effective than teacher modeling alone for increasing the rate of student encouragement in group settings.

With regard to the second experiment it was hypothesized that:

1. Teacher modeling would be an effective means for increasing the rate of student encouragement to low-skilled individuals in group settings.
2. Teacher modeling plus prompting would be more effective than teacher modeling alone for increasing the rate of student encouragement to low-skilled individuals in group settings.

With regard to the third experiment it was hypothesized that:

1. Teacher modeling would be an effective means for increasing the rate of student instruction to low-skilled individuals in tutorial settings.
2. Teacher modeling would be an effective means for increasing the rate of student encouragement to low-skilled individuals in tutorial settings.
3. Teacher modeling plus prompting would be more effective than teacher modeling alone for increasing the rate of student encouragement to low-skilled individuals in tutorial settings.

For all three experiments it was hypothesized that:

1. The student's sex would not differentially affect the degree to which he/she imitated the model's behavior.
2. Older children would exhibit more imitative behavior than younger children.
Significance of the Study

This study was performed to determine whether teacher modeling is an effective technique for changing student behavior. While it is generally believed that modeling procedures play an important role in teacher-student relationships, there is little direct research evidence to verify this assumption. A field-based investigation of teacher modeling would therefore appear to be a logical and necessary step in the development of a science of teaching. It is hoped that the results of this study can provide answers to the following questions:

1. Do students imitate specific behaviors modeled by their teachers?
2. Do tutorial modeling situations elicit more imitative behavior than group modeling situations?
3. Does teacher modeling plus prompting produce more imitative behavior than teacher modeling alone?
4. Do students of one sex exhibit more teacher-matching behavior than students of the other sex?
5. Do older children imitate their teachers to a greater degree than younger children?

If teacher modeling is not found to elicit matching behavior on the part of the students, then perhaps other instructional techniques are to be preferred to modeling in educational settings. However, if teacher modeling produces desirable results in terms of student imitative behavior,
then it would seem that educators should give greater attention to the planned utilization of modeling procedures in the classroom, gymnasium, and playing field. The outcome of this investigation should also provide a basis for further research on the efficacy of teacher modeling for the attainment of various educational objectives. Modeling may prove to be particularly effective for achieving objectives in the affective domain, such as establishing a non-threatening and encouraging environment for learning and performing physical skills.

Delimitations

The focus of this study was modeling of specific instructional and encouraging behaviors by teachers and the subsequent imitative behavior, if any, exhibited by their students. Data were obtained from seven educational settings within the Columbus metropolitan area in which elementary primary and elementary intermediate boys and girls were receiving instruction in physical education or athletic skills. Planned modeling episodes were implemented and observed in the following community youth athletic programs:

1. Baseball.
2. Golf.
4. Soccer.
5. Tee-ball.

6. Track and Field.

The data collection phase of this investigation was conducted during the Summer Term 1977 of The Ohio State University. The observations and data recording were performed by the investigator and two assistants. Event recording was employed to determine the number of discrete target behaviors (i.e., encouraging statements or instructional statements) displayed by the teachers and the students who participated in this study.

Definition of Terms

The following terms were defined for the purpose of this study:

Altruistic behavior - In the context of this study, altruistic behavior includes any helping or encouraging behavior directed to a student by the teacher or a peer student.

Elementary intermediate - Elementary intermediate, as used in this study, designates those children in grades four through six (ages nine through 11).

Elementary primary - Elementary primary, as used in this study, designates those children in grades one through three (ages six through eight).

Encouraging behavior - Encouraging behavior refers to any expression of encouragement directed to a student by
the teacher or a peer student. For example, verbal com-
ments such as, "You're doing much better," or "You almost
have it," would each be recorded as an instance of encour-
gaging behavior.

**Event recording** - Event recording is a cumulative re-
cord of the number of discrete occurrences of a specified
behavior within a given period of time.

**Imitative behavior** - Imitative behavior is the repro-
duction or near reproduction of modeled behavior by an ob-
server.

**Instructional behavior** - Instructional behavior con-
ists of verbal statements for the purpose of teaching spe-
cific physical skills. For example, verbal comments such
as, "Use both hands to catch the ball," or "Catch balls
above the belt with the thumbs together," would each be
recorded as an instance of instructional behavior.

**Matching behavior** - Matching behavior is the repro-
duction or near reproduction of modeled behavior by an ob-
server.

**Model** - A model may be a person, behavior, or de-
scription of behavior that serves as an example for an ob-
server.

**Modeling** - Modeling refers to the act of displaying
a behavior which serves as an example for an observer.

**Modeling plus prompting** - Modeling plus prompting in-
dicates modeling plus a verbal request to perform the
modeled behavior. For example, modeling encouraging behavior and asking the students to give encouragement to their teammates would be classified as modeling plus prompting.

**Limitations of the Study**

1. Due to practical considerations, the duration of this investigation was limited to approximately 10 weeks.

2. Due to practical considerations, the scope of this study was restricted to approximately 450 experimental interventions.

3. Due to practical considerations, data collection was confined to educational settings within the Columbus metropolitan area.

4. Data were collected only under conditions in which students were receiving instruction in physical education or athletic skills.

5. The independent variable in this investigation was teacher modeling of specific instructional and encouraging behaviors.

6. Although data were collected only on student imitation of specified instructional and encouraging behaviors modeled by the teacher, it was assumed that students would react in a similar manner to other behaviors exhibited by their teachers.
7. Teachers participating in this study received no specialized training in modeling theory or modeling techniques. All teachers were requested to maintain their normal instructional behavior, and some teachers were asked to prompt their students to encourage each other.
CHAPTER II
SURVEY OF RELATED LITERATURE

Behavior, including the learning of new behavior, can often be accounted for by the principles of operant conditioning. Responses which are positively reinforced tend to increase in strength and frequency of occurrence, whereas responses which are punished tend to decrease in strength and frequency of occurrence.

There are some situations, however, in which learning a new behavior through successive approximations or trial-and-error techniques would be unduly laborious and/or dangerous. Bandura (1965a) notes that operant conditioning procedures are seldom useful in training children to swim, teaching adolescents to drive an automobile, or helping adults to acquire vocational skills. In such circumstances, dire consequences are avoided (usually) by providing a model to demonstrate the appropriate behavior. The observer thereby learns the desired responses through the process of imitation.

Because operant conditioning methods are often inefficient for developing new behavior repertoires, models are
extremely useful in accelerating the process of response acquisition (Bandura, 1965a). In fact, according to Bandura, human behavior is transmitted, either deliberately or inadvertently, largely through exposure to social models. This learning phenomenon, variously known as contagion, copying, identification, imitation, incorporation, internalization, introjection, modeling, observational learning, role playing, and social facilitation, can perhaps best be designated simply as modeling (Bandura, 1971).

The first section of this review clearly illustrates an educational situation which is both promising and distressing. The situation referred to concerns the use of modeling techniques for achieving educational objectives more efficiently and more effectively. It is a promising situation because many leading educators and psychologists believe that much of the learning which occurs in schools is a function of modeling. Furthermore, they indicate that a better understanding and systematic application of modeling procedures could undoubtedly facilitate the instructional process. The distressing factor is the paucity of research on modeling in schools and educational institutions. It is rather unsettling to learn that a subject which is thought to have such important implications for education has received so little research. The major purpose of the
remainder of this review is to examine a large percentage of the existing modeling research literature, and to suggest implications which may be relevant to the field of education.

Suggestions for Modeling in Educational Settings

This section presents the opinions of educators and psychologists regarding the application of modeling techniques to classrooms and gymnasiums. Although only a few of these authors have personally conducted research on modeling, most are well-known synthesizers of research who have more than a cursory knowledge of modeling phenomena. The first recommendation, by Wodtke and Brown (1967), appears to be directed towards educational researchers. They contend that:

Many teaching practices undoubtedly involve elements of imitative or observational learning. Video-tape recordings, films, slides, audio-materials in the language laboratory, and even the lecture method itself are all predominantly observational or imitative in nature. This form of instruction is primarily reproductive and may be contrasted with more active, productive forms of instruction which place greater emphasis on student problem-solving and self-discovery. In view of the prevalence of imitative learning in the classroom, educational researchers would do well to study the phenomenon systematically (p. 529).

It is somewhat unclear, however, why Wodtke and Brown separate problem-solving and self-discovery methods from other forms of instruction in terms of modeling effectiveness.
It would appear that one of the best means for teaching problem-solving and self-discovery procedures would be through expert modeling of these techniques.

Dunkin and Biddle (1974) also indicate that educational researchers should investigate the efficacy of modeling techniques for shaping classroom behaviors. In their recent book, which presents a well-organized review of educational research, they state that:

As we shall use the term here, modeling refers to instances in which pupils are found to pattern their behavior after the behavior exhibited by another in the classroom. Surely this is an important process in the classroom. Teachers serve as models for decorum and adult behavior as well as exhibit attitudes toward the subject and pupils. Other pupils will serve as models, too... It comes as a surprise, then, to discover that practically no research has yet been conducted on modeling in the classroom context (p. 166).

It is noted that of the 151 references to modeling behavior reviewed in this paper, only six research investigations have occurred in public school classrooms. Quite obviously, the effects of modeling techniques on classroom behavior is a highly relevant area which deserves prompt and careful attention from educational researchers.

Good and Brophy (1973) have pointed out that students learn simply by observing the behavior of their teachers. They have also made it clear that teachers cannot elect to model at certain times and not at others. Consequently,
they recommend that the following teacher behaviors should be consistently modeled in the classroom:

1. Logical thinking and problem-solving behavior.
2. Curiosity and interest in learning for its own sake.
3. Credibility.
4. Rational control of behavior.
5. Respect for others.
6. Good group climate.
7. Interest in students.
8. Listening and communication habits.
9. Emotional control.

It is their contention that when such behavior is seen as relevant, effective, or rewarded, it is likely to be imitated by students.

Glavin (1974) notes that children acquire much of their behavior by modeling the behavior of others. He also suggests that modeling is an important means through which children internalize norms for self-standards. Furthermore, Glavin considers the status and skill of a model to be highly significant factors from the children's viewpoint. This contention has been verified by research (Burnstein, Stotland, and Zander, 1961; Bandura, Ross, and Ross, 1963a; see Characteristics of Effective Models section) and is clearly consistent with empirical observation. It would therefore seem important for teachers to make an effort to
be perceived as skillful and worthy of emulation by their students. Although improving one's skills may be considerably less difficult than increasing one's status, the nine classroom behaviors suggested by Good and Brophy may provide some insight for achieving the latter.

According to Williams and Anandam (1973), teachers are slightly more powerful role models than student peers in most classrooms. Bidwell (1973) indicates that this modeling influence is more potent for teachers in the elementary grades than for teachers in the secondary grades. An unfortunate situation may develop, however, if a student's peers do not value the same behavior as his/her teacher. Williams and Anandam believe that under such circumstances, the behavior which is rewarded by the teacher in the classroom may be punished by peers outside the classroom. Likewise, the effect of teacher modeling behavior is severely limited if the teacher is held in low esteem by his/her students.

Lefrancois (1975) believes that symbolic models play a significant role in our society. He considers such things as books, verbal or written instructions, pictures, cartoon or film characters, and television to be influential symbolic models. Since it is obvious that the symbolic models listed are very prevalent in the classroom, perhaps more care should be taken in their selection and use by teachers. Lefrancois also claims that the greatest advantage of
modeling over other types of learning is the complete behavioral sequence it provides for the learner. He contends that languages and motoric activities (i.e., walking) are learned largely through the process of modeling.

After carefully reviewing the modeling research, Flanders (1968) concluded that observers more readily imitate models of higher status, that is, models who have access to resources which the observers consider valuable. He also determined that maximal incentive conditions are more effective than moderate or minimal incentive conditions for eliciting imitative behavior. It would therefore appear that the effectiveness of classroom modeling could be enhanced if the controller of resources (hopefully the teacher) utilized the resources to maximize the student's incentive to imitate appropriate classroom behaviors.

Skinner (1968) suggests that relevant contingencies for imitative behavior arise naturally in almost any social environment. He feels that the teacher can incorporate and extend such contingencies by reinforcing a student when his/her behavior resembles that of an appropriate model (often the teacher himself/herself). Skinner also believes that modeling is more effective when the students are taught to discriminate among subtle features of behavior. He feels that the teacher can facilitate modeling discrimination by using conspicuous cues such as repetition, exaggeration, and deliberate responses.
Kagan, writing in 1958, developed some hypotheses which may be worthy of serious consideration by educators. These are stated below in the form of assumptions (pp. 298-300):

Assumption One: Initially the subject perceives that the model possesses goals and satisfactions that the subject desires.

Assumption Two: The wish to command the goal states of the model leads to the desire to possess the characteristics of the model because the subject believes that if he were similar to the model he would command the desired goals.

Assumption Three: The identification response is reinforced each time the subject perceives or is told that he is similar to the model.

Assumption Four: In order for the identification belief to be maintained, the subject must not only perceive similarity between the subject and the model but he also must experience some of the desired, affective goal states of the model.

If these assumptions were proven to be valid, there would be a number of implications for maximizing modeling effectiveness in the classroom. To begin with, the teacher could strive to become competent (i.e., skillful, knowledgeable) in an activity in which the student desires to be competent. Secondly, the teacher could model appropriate and desirable characteristics which the student could begin to imitate. Next, the teacher could reinforce the student for progressive approximations of the appropriate and desirable characteristics. Finally, the teacher could make every effort to insure that the student does indeed achieve and receive reinforcement for the sought-after behavior (i.e., skills, knowledge).
Homstein (1970) contends that the probability of an observer helping another person is increased by a model's attempt to help that person. According to Homstein, the model alerts the observer to certain alternatives and demonstrates the reward contingencies associated with his/her actions. This would appear to be sage advice for the teacher who desires a helpful and cooperative classroom atmosphere. It would seem that the teacher who models helpfulness, encourages helpfulness, and reinforces helpful models would tend to promote an altruistic climate in his/her classroom.

On the other hand, Johnson and Johnson (1975) state that:

... if a teacher models competitive behaviors and rewards students for engaging in competitive behaviors, the effect will be a great deal of competitive behavior on the part of most students (p. 98).

They believe that teachers, because of their control over the distribution of rewards, exert a powerful influence on student behavior. Consequently, they strongly recommend that teachers model, encourage, and reward cooperative behavior within the classroom.

Gage (1972) believes that much of the learning which occurs in schools and elsewhere is a function of imitation, and asserts that teaching by modeling means that the teacher behaves the way he/she wants the students to behave. According to Gage, the characteristics of the model are highly relevant to this type of learning. He indicates that
only when the model is perceived as having prestige will
learning through imitation be maximized. It appears that
one way in which a teacher may achieve prestige with his/her
students is to display competence (i.e., skills, knowledge) in areas which they consider valuable and important.

The training of teachers has long involved the observation of master teachers by student teachers. It must be
assumed, therefore, that teacher education programs have relied heavily on modeling techniques for the professional
preparation of their students. However, McDonald (1973) does not feel that teacher educators have made the best use
of modeling opportunities. Rather than exposing the student teacher to a single model, he advocates the systematic
provision of different kinds of models and various conditions of practice. In the former condition, McDonald doubts
that what the observer learns can be transferred to other teaching situations unless there is a high degree of similarity. Also, because teaching is a complex activity which incorporates a large number of behaviors, McDonald believes that a cueing procedure is necessary to direct the observer's attention to specific teaching behaviors. He recommends that, "Economy and efficiency will be achieved if we can develop more effective modeling procedures to teach effective teaching behavior" (p. 71). Although exposure to a variety of teaching models should perhaps be part of the education student's pre-service preparation, research by
Zevin (1974; see Modeling in the Classroom section) implies that the intern should have a cooperating teacher who models the teaching techniques which he/she wishes to acquire. It would perhaps be most appropriate to systematically present a variety of models and practice conditions during the early stages of teacher training, and allow the student to select a particular model during the latter stages of teacher training.

Fuller and Bown (1975) agree with McDonald that teacher educators have failed to model the kind of teaching behavior they advocate for their students. They contend that if teacher educators modeled concern for their students, graduates entering the profession would most likely show greater concern for their pupils.

Ryan (1974) believes that a teacher educator must be a model of teaching excellence. According to Ryan, "He should be a moral, caring, effective, and integrated human being. We should accept no less" (p. 160). He further outlines four goals for which teacher educators should strive:

1. Good models of teaching.
2. Good clinical supervisors.
3. Good scholars.
4. Informed managers of institutionalized teacher education.

It is noteworthy that Ryan has assigned highest priority to the modeling of desirable teaching behaviors.
Koran has performed several experiments to investigate the effect of video-taped models on the acquisition of specific teaching behaviors (see sections on Modeling in the Classroom and Symbolic Models). In one study (1969a), Koran presented a paradigm for training teachers through the use of video-taped models. He recommends the following steps for optimizing the learning outcomes:

1. Trainees should be aware that they will be observing desirable teaching skills.
2. Trainees should be provided with an appropriate model for a specific teaching behavior.
3. Trainees should be encouraged to practice the modeled teaching skills in their own classrooms.
4. Trainees should be provided with video-tapes of their own performance for comparison to the modeled performance.

As suggested by Young (1969; see Symbolic Models section), exposure to the filmed model may be more effective if the observer is provided with concurrent discrimination training\(^1\) (i.e., by a supervisor). Essentially, Koran's teacher training procedures are the same as those incorporated in microteaching episodes. The only real difference is that the microteaching trainees practice the modeled teaching

\(^1\)Discrimination training means that relevant behaviors are indicated to the observer as they occur.
skills with a small group of students for an abbreviated time period, rather than in an actual classroom.

Preliminary research in microteaching (Allen and Ryan, 1969) indicates that modeling may be a highly effective technique for changing teaching behavior. As previously noted, microteaching programs usually incorporate filmed models of specific teaching skills which can be viewed by the learners as often as is necessary. According to Allen and Ryan:

Seeing a demonstration in which a particular skill is highlighted appears to have much more transfer quality than the other alternatives of verbal or written instructions. The quality of high definition that is basic to a good model makes initial understanding and appreciation of the skill much easier for the trainee (p. 32).

They believe that the learning of complex teaching behavior may be facilitated through modeling of the various component skills. Furthermore, they feel that research on specific modeling techniques should be a high priority endeavor in the field of teacher education.

Obviously, not every modeled behavior will result in matching behavior on the part of the observer. Unless the observer attends to, recognizes, and differentiates the distinctive features of the model's response, he/she will fail to acquire matching behavior. In many cases, however, even though modeled response patterns have been acquired and retained in representational forms, they cannot be reproduced behaviorally due to physical limitations. In fact, Bandura
(1965a) claims that exposure to modeling behavior is often not sufficient for learning complex psychomotor skills. Because such skills are generally governed by proprioceptive stimuli that are neither observable nor easily described verbally, varying amounts of overt practice are usually necessary to produce the desired response. According to Bandura, practice appears to be most effective when it is interspersed with natural segments of a larger modeled pattern.

The use of modeling techniques has probably been more common in the gymnasium than in the classroom. Perhaps the most frequently used teaching method in physical education has been demonstration followed by practice of the skill, as suggested by Bandura. In support of teaching by demonstration Lawther (1977) suggests that many skills can be learned effectively and promptly by imitation after direct observation. Nixon and Locke (1973) speak even more strongly on the merits of skill modeling. They contend that, "... some form of demonstration is the most direct and economical method of communicating the practice task to the learner" (p. 1218). Dauer and Pangrazi (1975) further elaborate on the usefulness of demonstration for teaching physical skills. In their opinion:

Demonstrations serve the purpose of illustrating variety or depth of movement, showing something unique or different, pointing out items of good technique or approach, illustrating different acceptable
styles, and showing progress or accomplishments. . . . The more critical the skill, the more demonstration is perhaps needed (pp. 58-59).

Even with very young children, Cratty (1970) claims that parents (and presumably teachers) provide models of action or inaction which the children tend to copy. It would appear, therefore, that demonstration (modeling) is an effective technique for teaching psychomotor skills, whether the critical behavior is very general or highly specialized.

Nevertheless, teaching skills strictly by means of demonstration may have certain limitations. According to Humphrey, Love, and Irwin (1972), students may be inclined to merely reproduce the modeled behavior without understanding its purpose. Maccoby (1959) expresses a similar concern and suggests that children may learn (through modeling) the responses of others, but fail to learn the cues which prompted the responses. If such is the case, it would seem well-advised to supplement demonstrations with appropriate explanations and discrimination training.

Rushall and Siedentop (1972) believe that modeling plays an important role in the development of sport skills. Three of their statements seem particularly relevant for physical education teachers and coaches:

1. Learning is accelerated by using models to demonstrate skilled behavior (p. 65).
2. It is common to see people imitate the techniques of successful athletes (p. 65).
3. Persons do adopt a model's reinforcement criteria and evaluate their own performance in the light of these criteria (p. 68).

The first two statements indicate the importance of providing skillful models when teaching physical skills. The third statement suggests that the model should establish a criterion level of achievement that is challenging, yet obtainable for the observers.

Siedentop (1976) points out another aspect of modeling that appears to have important implications for physical education teachers. He advises that physical education teachers should be fully cognizant of their unspoken influence on the students. Regardless of what the physical educator says, the degree to which he/she practices fairness, sportsmanship, good health habits, physical fitness, discrimination, and responsibility provides an inescapable model for his/her students. As indicated by Bryan and Walbek (1970; see Characteristics of Effective Models section), the behavior of observers is more strongly influenced by what a model does than by what he/she recommends. Siedentop also notes that students can function very well in the role of teaching agents. He submits that student peers, "... provide superb demonstrations that are good models for students because the teaching-student is closer in age and developmental level to the learning-students than is the teacher" (p. 242).
It is difficult to draw concrete conclusions from this section since most of the proposals presented are not based on research performed by the authors. Nonetheless, the following three statements seem to be representative of the informed opinions regarding modeling in educational settings:

1. Much of the learning which occurs in schools is a function of modeling.
2. The systematic application of modeling procedures can probably facilitate instructional processes.
3. There is very little actual research on modeling effectiveness in the classroom.

**Modeling Theory**

This section will present a brief review of the most prominent theories on modeling behavior. The issue of modeling and reinforcement was seriously addressed in 1941 by Neil Miller and John Dollard. In their book, *Social Learning and Imitation*, they proposed that behavior is acquired when an observer is rewarded for imitating a model. Their work led them to conclude that:

> These experiments have confirmed the deduction from learning theory that an individual can learn to discriminate between leaders as good and bad models. He learns to copy the leader whom he is rewarded for copying and to non-copy the leader whom he is rewarded for non-copying (p. 181).

Miller and Dollard argued that imitative behavior is learned and follows the laws of learning, namely, that it will tend
to appear when it is rewarded and tend not to appear when it is non-rewarded or punished.

O.H. Mowrer (1960) expanded upon Miller and Dollard's theory by emphasizing the role of vicarious reinforcement. According to Mowrer, watching a model being reinforced for a particular behavior encourages the observer to view that behavior in a positive manner. He contended that:

The extent to which this "higher-order" vicarious learning occurs in animals is perhaps open to debate; but it occurs very commonly at the human level, and is verbalized by the remark: "If that kind of behavior is good (or bad) for others, it will probably be good (or bad) for me; I think I will (will not) try it myself" (p. 115).

He also pointed out that "doing" is not a necessary condition for learning, but that, "... given the right circumstances, behavior can be facilitated, extinguished, or inhibited without occurring" (p. 64).

In his recent book on social behaviorism, Arthur Staats (1975) indicated that a model may do more than merely elicit imitative behavior from an observer. According to Staats, a model may actually produce a positive emotional response in the observer. By this he implies that the observer associates the model himself/herself with positive reinforcement, rather than a specific behavior which the model performs. In such cases, matching the model's behavior across a variety of categories becomes highly reinforcing for the observer. Conversely, discrepancies between the model's behavior and his/her own behavior have a
non-reinforcing effect on the observer. Staats also proposed that the ability to imitate a model is dependent upon the observer's behavioral (sensorimotor) repertoire.

Justin Aaronfreed (1969), in his fairly extensive review of modeling research, concluded that attention is a necessary condition for all forms of observational learning. He also theorized that discriminative stimuli play an important role in modeling behavior, as indicated by the following statement:

In general, no matter how powerful may be either the intrinsic value or the potential external outcome value of a child's behavioral reproductions of a model, the reproductions will always continue to be sensitive to the discriminative control of external situational cues (p. 274).

Unquestionably, the most industrious researcher of modeling phenomena has been Albert Bandura. To begin with, Bandura (1973) has classified modeling behavior into three distinct categories:

1. Modeling Effect—A person may acquire a new behavior through observation of a model.

2. Inhibitory/Disinhibitory Effects—A person may increase or decrease his/her tendency to avoid a specific behavior through observation of a model.

3. Response Facilitation Effect—A person may be prompted to perform a previously learned response through observation of a model.

An example of the modeling effect is demonstrated in Craig's (1967) study (see Vicarious Reinforcement section), in which
subjects learned to solve a complex maze problem by observing a model perform the task. The dog-avoidance study by Bandura and Menlove (1968; see Vicarious Reinforcement section) illustrates the disinhibitory effect. In this experiment, children decreased their tendencies to avoid dogs after observing a model play happily with a dog. If, on the other hand, the dog had bitten the model, the modeling episode would have increased the children's tendencies to avoid dogs, thus producing an inhibitory effect. The response facilitation effect is demonstrated in the study by Rosenbaum and Blake (1955; see Modeling Influence section). In their study, students accepted an invitation to participate in an experiment after observing a model agree to do so.

Bandura (1973) has also postulated that the modeling process depends on four interrelated sub-processes:

1. Attentional Processes- An observer must attend to the important features of the model's behavior.
2. Retention Processes- An observer must remember the important features of the model's behavior.
3. Motor Reproduction Processes- An observer must possess the necessary physical skills to perform the modeled behavior.
4. Reinforcement and Motivational Processes- An observer must be reinforced for performing the modeled behavior.
According to Bandura, only the first two sub-processes, attention and retention, are necessary for learning a modeled response. He believes that modeled behavior is learned as a whole through symbolic processes, and refers to this as the acquisition phase of modeling. However, in order to reproduce modeled behavior, all four sub-processes must be operative. Only when the observer has the requisite psychomotor ability and anticipates reinforcement for his/her actions will he/she perform a matching response. Bandura notes that reinforcement may take the form of direct reinforcement, vicarious reinforcement, or self-reinforcement. Bandura's theory that modeling involves both an acquisition phase and a performance phase appears to have empirical support. Undoubtedly, most people have learned (through the observation of models) how to do something that they will never actually do. For example, many detective show viewers could easily describe how to commit a variety of criminal acts, but will never actually do so (hopefully). In addition, research studies by Bandura, Ross and Ross (1963b) and Bandura (1965b) indicate that there is a difference between the acquisition of modeled behavior and the performance of modeled behavior.

Bandura (1969) has also hypothesized that modeling inputs are retained in symbolic form as words and images, which thereby enables an observer to reproduce the behavior apart from the model. The results of investigations by
Bandura, Grusec, and Menlove (1966) and Gerst (1971) suggest that symbolic processes may indeed have an important influence on modeling behavior.

In summary, it would appear that a comprehensive theory of modeling behavior should take the following propositions into careful consideration:

1. Bandura has classified modeling behavior into three distinct categories:
   a. Modeling Effect.
   b. Inhibitory/Disinhibitory Effects.
   c. Response Facilitation Effect.

2. According to Bandura, the modeling process depends on four interrelated sub-processes:
   a. Attentional Processes.
   b. Retention Processes.
   d. Reinforcement and Motivational Processes.

3. Bandura has theorized that modeling involves an acquisition (learning) phase and a performance phase.

4. According to Bandura, the performance of modeled behavior is contingent on reinforcement, but the acquisition of modeled behavior is not.

5. Bandura has hypothesized that modeling inputs are retained in symbolic forms as words and images.

6. Aaronfreed has suggested that discriminative stimuli play a highly significant role in modeling behavior.
7. Staats has proposed that the ability to imitate a model is dependent upon the behavioral (sensorimotor) repertoire of the observer.

If one were to develop a model for modeling behavior, it would most likely include the following six features:

1. Model Conditions - The specific conditions under which the model performs a behavior.
2. Model Response - The specific behavior performed by the model.
3. Model Consequences - The specific outcome of the model's behavior (i.e., reinforcement).
4. Observer Conditions - The specific conditions under which the observer performs imitative behavior.
5. Observer Response - The specific imitative behavior performed by the observer.
6. Observer Consequences - The specific outcome of the observer's imitative behavior (i.e., reinforcement).

These relationships could be represented in the following manner:

Model Conditions --- Model Response --- Model Consequences
Observer Conditions --- Observer Response --- Observer Consequences

By definition, for imitative behavior to occur, the observer's response must be highly similar to the model's
response. Quite obviously, the observer's imitative behavior will be facilitated to the degree that the modeled response falls within his/her behavior repertoire.

In terms of performance conditions, it is assumed that the observer will discriminate between those situations in which the modeled response is appropriate and those in which it is not. Also, it would appear that the observer's imitative behavior will be facilitated to the degree that the observer conditions match the model conditions.

The issue of consequences, which is somewhat more complex, has been the subject of numerous research studies and much debate. Some theorists contend that seeing the model reinforced for his/her behavior is sufficient incentive for imitative behavior on the part of the observer. This phenomenon is called vicarious reinforcement, and is based on the assumption that the observer anticipates similar reinforcement for performing similar behavior. Other researchers claim that direct reinforcement to the observer increases the likelihood of imitative behavior. Under conditions of direct reinforcement the model may or may not be reinforced for his/her behavior, but the observer is reinforced for producing a matching response. It would seem reasonable to suggest that imitative behavior will be facilitated to the degree that both the model and the observer are reinforced for their actions.
Based on the model for modeling behavior and the assumptions presented above, the following steps would appear to be essential for maximizing imitative behavior:

1. Select response skills which are well within the observer's behavior repertoire.
2. Match the conditions under which the observer performs to the conditions under which the model performs.
3. Reinforce both the model's behavior and the observer's imitative behavior.

Example

A teaching supervisor wants his students to develop better questioning skills. He believes that questioning skills can best be taught through a combination of modeling and positive reinforcement, and decides to incorporate a video-taped teaching model. In preparing the teaching model, he is careful to maximize the potential for imitative behavior, as follows:

1. He selects response skills which are well within the students' behavior repertoires.
   a. Convergent questions.
   b. Divergent questions.
   c. Value questions.
2. He matches the conditions in which the observers perform to the conditions in which the model performs.
   a. Suburban school.
   b. Traditional classroom.
   c. Above average class of 25 sixth graders.
   d. Cooperating teacher is present during the entire 20 minute questioning session.
   e. Model is similar to the viewers (college peer).
3. He reinforces both the model's behavior and the observers' imitative behavior.
   a. The video-tape concludes with a positive interaction between the model and the supervisor, in which the model receives praise, an "A" grade, and an opportunity to substitute more practical experiences for lecture courses.
   b. The supervisor promises and delivers the same reinforcers to students who display similar teaching behavior.

The Modeling Influence

A number of research studies have demonstrated that a model's behavior can have a significant influence on the subsequent behavior of the observers. One of the early investigations of the modeling influence was undertaken by Blake, Rosenbaum, and Duryea (1955). Their study centered around the purchase of a gift for the department secretary.
who was resigning her post, and was conducted under authent­

cic conditions. Each of the 50 graduate students was asked
to give whatever they would like in terms of a cash dona­
tion towards the gift. During the encounter, the experi­
menter conspicuously held a clipboard which presumably showed
the monetary contributions of previously contacted graduate
students. Under two of the treatment conditions the aver­
age recorded donation was 25 cents (narrow and wide distri­
bution of amounts), and under two other conditions the aver­
age recorded donation was 75 cents (narrow and wide distri­
bution of amounts). The results of the study indicated
that the amount of one's contribution is influenced by the
size of the contributions presumed to have been given by
others. When the subjects were exposed to the 25 cent stan­
dards the average donation was 32 cents, and when they were
exposed to the 75 cent standards the mean contribution was
63 cents. The amount of variability contained within the
standard did not appear to affect the magnitude of the do­
nations.

In the same year, Rosenbaum and Blake (1955) con­
ducted another investigation of the modeling influence on
subsequent observer behavior. Students, seated in a uni­
versity library, were asked to participate in a psychology
experiment. Under one set of conditions the test subjects
observed a model accept the invitation to participate be­
fore the same request made to them. Under another set of
conditions the model was seen to reject the invitation to participate, and in the control condition the test subjects did not have an opportunity to observe a model prior to receiving an invitation to participate. The investigators found that significantly more subjects volunteered under the model acceptance condition than under the control condition. Similarly, they discovered that significantly fewer subjects volunteered under the model refusal condition than under the control condition.

Helson, Blake, Mouton, and Olmstead (1956) investigated the effects of modeling on the stated attitudes of subjects concerning a controversial issue. The subjects' opinions regarding war and peace were solicited and judged under simulated group conditions and in an alone condition. In the group condition each subject heard four other simulated subjects express their judgments prior to expressing his/her viewpoint. The results of the study indicated that exposure to models' opinions on issues of war and peace influenced the subjects to shift their own expressed attitudes toward the group consensus.

Rosenbaum (1956) performed an investigation very similar to the one that he and Blake conducted in 1955. Once again, students studying at the university library were invited to participate in a psychological experiment under varying conditions of request intensity and background stimulation. In the positive background condition the
test subject observed a model agree to participate in the experiment just prior to receiving the same request. In the negative background condition the subject witnessed a model refuse to participate, and in the neutral condition no modeling episode was incorporated. Rosenbaum found that both request intensity and background factors were significantly related to the volunteering response. In concurrence with previous results, greatest acceptance occurred under positive background conditions and least acceptance accompanied negative background conditions.

Ninety college students were recruited by Kimbrell and Blake (1958) on the pretense of participating in a taste preference experiment. Each subject ate six crackers. One group of subjects (weak thirst condition) was given plain crackers, and another group (strong thirst condition) received crackers treated with Mexican hot sauce. After consuming the crackers the subjects were asked to wait in the corridor. Although a drinking fountain was available, a sign which read "Do not use this fountain" was conspicuously posted above it. The authors found that more violations occurred when the subjects saw another person violating than when they observed another person conforming to the prohibition. The results clearly showed that observation of a model drinking from the fountain reduced the subjects' inhibition to perform the same act. However, although a greater percentage of the subjects in the strong
thirst condition drank from the fountain, subjects in the weak thirst condition were more strongly influenced by the model's behavior. In the no-model condition none of the weak thirst subjects disregarded the sign, but in the model-present condition 50 percent of the weak thirst subjects did so.

A rather unusual experiment on modeling was conducted by Walters, Bowen, and Parke (1964). Sixty male college students viewed a film which included nude and semi-nude pictures of males and females. The subjects were concurrently shown the eye movements of a model who had presumably watched the film on a previous occasion. The actual eye movements of the participants were subsequently recorded as they observed a parallel set of pictures in the presence of a female experimenter. Exposure to the model resulted in imitative looking behavior when the stimuli were sexually significant. The results also indicated that observers who are uncertain how to respond in a given social situation may be readily influenced by the actions of a model.

Gelfand and others (1974) conducted three closely related experiments to determine whether children (88 six to eight year olds) would teach other children by the same methods that they were taught. Each subject was instructed to play a game utilizing marbles. One group of children was rewarded for successful attempts, another group was
punished for unsuccessful attempts, a third group was both rewarded for successes and fined for errors, and a fourth group received no consequences for participating in the game. Each subject was then asked to teach another child to play the game.

The investigators found that the subjects tended to imitate the instructional strategy which they had previously experienced. Subjects who had received rewards for successes rewarded their students for successful attempts, and subjects who had been fined for errors fined others when they were unsuccessful. The subjects who were both rewarded and punished incorporated a similar strategy with their students, while those subjects who received no consequences generally did not provide any consequences to their students. Upon obtaining significant modeling effects in all three experiments, the authors strongly advised against the use of punitive teaching and managerial techniques since children exposed to such models of behavior tend to impose similar treatment on their subordinates.

Although there appears to be a considerable amount of evidence that children tend to imitate a model's behavior, Miller and Morris (1974) note that the effects of being imitated have been largely overlooked. Consequently, they investigated children's (36 preschoolers) reactions to being imitated by an adult on a marble dropping task. The children were given a choice of three holes in which to
deposit their marbles. During the first half of their trials, the experimenter imitated the choice of one hole, and during the second half of the trials he imitated the choice of another hole. At no time did the experimenter imitate the choice of the third hole. The findings supported the hypothesis that the imitated responses would increase in frequency of occurrence and the nonimitated responses would decrease in frequency of occurrence. The investigators suggested three possible explanations for the reinforcing effects of being imitated. First, being imitated may give one a feeling of control over the social environment. Second, being imitated may decrease the uncertainty of selecting responses from among various alternatives. Third, being imitated may be less a factor in selecting the same response than the child's inclination to match the adult's response. Whatever the explanation may be, it appears that children tend to repeat behaviors that are imitated more frequently than nonimitated behaviors.

The effects of being imitated were also studied by Thelen and others (1975). First grade children were simultaneously exposed to an adult who imitated their responses on various tasks and to an adult who did not copy their responses. The children were then assessed in terms of their preference for and imitation of one of the adults. The results showed that being imitated had a significant influence on the children's behavior. They not only preferred
the company of the imitating adult, but also tended to imi-
tate his behavior in a subsequent activity. It would there-
fore appear that being imitated may both reinforce the per-
son being copied and encourage him/her to perform recipro-
cal imitative responses.

Schwartz (1970) submits the following explanation for
the well-documented effect of modeling on the subsequent
social behavior of the observers:

The behavior of models, for example, may draw
attention to certain lines of actions and sets of
consequences rather than to others, thereby increas-
ing the likelihood of prosocial or antisocial behav-
ior (p. 129).

Macaulay (1970) concurs with Schwartz that a model may alert
an onlooker as to what behavior is proper in a given situ-
ation, and suggests that the model's response may define the
most acceptable course of action. By so doing, the model
may indicate which behavior is likely to be reinforced by
self-approval and/or approval by others. Additionally, the
model may lower restraints against a particular behavior by
demonstrating that one may make such a response without in-
curring public disapproval. Macaulay found this aspect of
modeling highly relevant in an investigation involving char-
itable contributions at a relief table in a college union
building. It appeared that most people would stop at the
table only if someone else was already there. As Macaulay
noted, "People seemed to avoid solo action" (p. 59). In
answer to the question, "What is it that the model does
that has such a reliable effect?" (p. 43), it may be that
the model merely reveals what norms are and are not rele-
vant to the situation. In operant terminology, it may be
that the model demonstrates what behavior (response) is ap-
propriate (reinforced) under a certain set of conditions
(discriminative stimuli).

Characteristics of Effective Models

Lefkowitz, Blake, and Mouton (1955) devised an ex-
periment in which the model performed the same behavior
under two conditions of perceived social status. In both
conditions, a male model crossed a traffic intersection
against the instructions of a pedestrian traffic signal.
Under the high status condition the model was dressed in
expensive clothing, and under the low status condition the
model was shabbily attired. The results showed that the
violating behavior of a model, regardless of his perceived
social status, significantly increased the pedestrian vio-
lations rate beyond that occurring in the absence of a mod-
el. However, a significantly greater number of pedestrians
violated the traffic signal when the model's status was per-
ceived to be high rather than low. Consequently, the per-
ceived social status of a model seemed to affect imitative
behavior on the part of the observer. Actually, it would

2A discriminative stimulus sets the occasion for
which a particular type of behavior has previously been
reinforced.
appear that the observers discriminated between the two models in terms of which model would be "safest" to imitate.

In an attempt to determine what character types children tend to identify with, Maccoby and Wilson (1957) showed movies to approximately 600 seventh graders drawn from highly divergent socioeconomic backgrounds. The two main characters in the first movie were an upper-middle class boy and a lower class boy, both of whom were a few years older than the viewers. The investigators found that a boy's choice of screen model was more strongly influenced by the social-class level to which he aspired than by the present social-class position of his family. The second movie included both a male and female leading character who were similar in age to the subjects. As expected, the results revealed that adolescent observers identified themselves with the leading character of the same sex. Therefore, based on this study, it would seem that observer identification with a model is at least partly influenced by the model's sex and socioeconomic status.

Rosenblith (1959) compared the maze-solving performance of kindergarten children under two experimental conditions:

1. Observing a model.
2. Taking additional trials without a model.

She found that having a model produced better results than having additional trials. She also discovered that the
male model was more effective than the female model, and that model attention\(^3\) was superior to withdrawal of attention. Apparently, at least with this particular age group, the model's sex and attentional focus have an effect on the observer's imitative behavior.

In a study by Kanareff and Lanzetta (1960), the subjects first experienced either contrived success or failure on an individual task. They then performed the critical task, but were exposed to a model's judgment prior to making their own decision. Under one experimental condition the model chose the correct alternative 50 percent of the time, and under another condition the model was successful 80 percent of the time. The results showed that subjects who had been unsuccessful in the initial task imitated the responses of the more competent model to a greater degree than the previously successful subjects. This finding would tend to indicate that the perceived difference in competence between a model and an observer has an influence on the latter's level of imitation.

Rosenblith (1961) conducted a second investigation with kindergarten children. During the initial session, in addition to solving a maze problem, the children were given a selection of colored pencils to choose from. In the second session, one to three weeks later, an adult model chose

\(^3\)Model attention refers to interactions with the child, especially those initiated by the model.
one of the colored pencils not selected by the child and worked the maze problem while the child observed. The four treatment conditions differed by sex (male model or female model) and attentional focus (attentive to child during play time or withdrawal of attention). The subsequent imitative behavior on the part of the children was summarized as follows:

For girls, color matching depends on attention from the model. Learning by imitation depends on having a male (opposite sexed) model. For boys, color matching depends on having a male (same sexed) model. Learning by imitation is more complex; it depends on having a same sexed leader who withdraws attention or an opposite sexed leader who is attentive (p. 222).

Although the results are somewhat difficult to interpret, it again appears that the imitative behavior of young children is influenced by a model's sex and attentiveness.

The effects of perceived similarity to a model were investigated by Stotland, Zander, and Natsoulas (1961). Seventy college women were exposed to a model who had either similar or dissimilar musical preferences. Each subject was then made aware of additional attributes of the model, and tested to see if she would assimilate these attributes into her own self-concept. Also, the subject was informed of other attributes in herself and given the opportunity to project these into her concept of the model. The findings indicated that, given an ambiguous task, the subjects tended to select the alternative chosen by the model with whom they agreed more often on musical
preferences. In addition, the subjects assigned their own preferences for girls' names to the model with whom they more frequently agreed on musical preferences. These results suggest that perceived similarity to a model in one respect may increase the observer's tendency to imitate the model's behavior in other situations.

Burnstein, Stotland, and Zander (1961) examined the effects of model similarity and model competence on the imitative behavior of the observers. In one phase of the experiment, the model was presented to sixth, seventh, and eighth grade boys as a deep-sea diver who was either highly similar or very dissimilar to the boys in terms of background and various attributes. The results showed that subjects who perceived the model as similar to themselves accepted his diving preferences more than subjects who saw little similarity between themselves and the model. In another phase of the study, the model described himself as a deep-sea diver with either a large repertoire of diving abilities or a limited number of diving skills. The findings indicated that the boys accepted the preferences of the competent model more than the preferences of the less able model. Furthermore, the observers projected more of their own preferences onto the skillful model than onto the less competent model. It would appear, therefore, that how an observer perceives a model in terms of similarity and/or
competence influences the degree to which he/she identifies with and imitates the model.

Bandura and Huston (1961) tested the hypothesis that much of a child's behavior repertoire is acquired through identification with the important adults in his/her life. Prior to the modeling situation, half of the 48 preschool-age subjects experienced a warm (nurturant\(^4\)) interaction with a model, while the remaining subjects were treated in a cold (non-nurturant) manner. The children then participated in a two-choice discrimination problem in which the model displayed a number of explicit incidental behaviors. With the exception of aggressive responses, which were imitated by the children regardless of the model-child relationship, the findings indicated that model nurturance facilitated children's imitative behavior. The investigators concluded that, "... children display a good deal of social learning of an incidental imitative sort, and that nurturance is one condition facilitating such imitative learning" (p. 316).

The relationship between a model's competence and an observer's degree of imitative behavior was investigated by Rosenbaum and Tucker (1962). The subjects, male college

\(^4\)The term nurturance will be used in this paper to indicate a relatively high frequency of positive interactions (i.e., talking, playing, etc.) between the model and the observer.
students, were required to predict the outcomes of fictitious horse races after exposure to a model's prediction. Under three conditions of model competency, the model was correct on 80 percent, 50 percent, or 20 percent of his predictions, respectively. Half of the subjects were judged correct when their response matched that of the model, and the others were judged correct for non-matching the model's prediction. With those subjects who were reinforced for imitation, the results indicated that the greater the competence of the model (measured in absolute terms, rather than relative to the observer), the greater is the facilitation of imitative behavior. This finding tended to support the investigator's hypothesis that, "... human organisms learn early to differentiate among others in terms of competence and, accordingly, in terms of prospects for successful imitation" (p. 183).

Bandura, Ross, and Ross (1963a) performed a study in which children were simultaneously exposed to two adult models. In one set of conditions, one model was the controller of attractive resources and the other model was the recipient of these resources. An experiment was conducted to determine whether the children would subsequently imitate the model who provided reinforcement or the model who received reinforcement. The results showed that the behavior of the reinforcing model was imitated to a greater degree than that of the reinforced model. This finding
would seem to suggest that the status of a model (i.e., his/her control over valued resources) may exert a major influence on an observer's modeling behavior.

The effects of nurturance, nurturance withdrawal, and isolation on children's direct attention seeking and imitative behavior were investigated by Stein and Wright (1964). One group of preschool children experienced model nurturance, another group was given model nurturance followed by withdrawal of attention, and a third group experienced isolation. All of the children were then given social reinforcement for performing imitative responses. Imitation of the model's behavior was found to increase when the subject responded to withdrawal or isolation with increased dependency, and when the subject responded to continuous nurturance with decreased dependency. The former finding lends support to the investigators' proposal that:

... when a highly nurturant parent withdraws attention, dependency anxiety is aroused, and the child is especially likely to manifest both direct attention seeking and imitation of approved parental behaviors (p. 928).

Although the latter finding is somewhat more difficult to explain, it does appear that model nurturance has an effect on imitative behavior in young children.

An investigation of the effects of mother nurturance on a daughter's modeling behavior (Mussen and Parker, 1965) produced less ambiguous results. In this study, the mother-daughter relationships were classified as being more
nurturant or less nurturant (presumably a measure of closeness and togetherness). The girls first observed their mothers solve a maze problem and then attempted to solve the problem themselves. The investigators recorded instances of matching behavior that were not relevant to solving the problem (incidental imitation learning). The results revealed that mother nurturance was clearly related to the girls' incidental imitation learning (i.e., using a crayon of the same color, repeating their mothers' irrelevant utterances, etc.). Mussen and Parker concluded that:

... if the parent is generally nurturant toward the child, there is an increased tendency for the child to imitate aspects of that parent's behavior spontaneously, that is, in the absence of an immediately preceding experience of nurturance or of direct tuition or specific rewards for this imitation (p. 96).

Based on these results, it would seem that nurturance has a positive effect on the imitative behavior displayed by young girls.

The modeling influence of rewardingness and control over resources was investigated by Grusec and Mischel (1966). In one treatment condition, nursery school children were exposed to a high-rewarding model who gave them many toys to play with, much praise, and described herself as their future teacher. In the other experimental condition, the

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5Rewardingness refers to the frequency and amount of reinforcement given to the children by the model.
children encountered a low-rewarding model who provided few toys, little praise, and claimed to be only a substi­
tute teacher. The findings revealed that the children re­
called the behavior of the high-rewarding model better than the behavior of the low-rewarding model. The researchers therefore concluded that, "The present results support theories of identification which stress the power of the model as a determinant of the degree to which his behaviors are acquired" (p. 214). Apparently, model rewardingness and control over resources enhance the acquisition of mod­
eled behavior by the observer.

Sometimes, a model's behavior becomes "characteristic" of the model. For example, a study by Stein (1967) demon­
strated that a model who yields to temptation is imitated more than a model who resists temptation. The experimental situation involved sitting in a chair and monitoring a con­
trol panel while an attractive movie was being shown nearby. Under the yielding condition an adult model left his chair to take a look at the movie, whereas under the resisting condition the model faithfully monitored the control board. Children who observed a yielding model exhibited signifi­
cantly more yielding behavior, but subjects who witnessed a resisting model showed no more resisting behavior than a no-model control group. These findings seem to support the common observation that children tend to imitate yielding models to a greater degree than resisting models. However,
if the yielding model had been punished and the resisting model rewarded, the children's imitative behavior may have changed accordingly.

Mischel and Liebert (1967) investigated a well-known phenomenon in which an adult imposes more stringent reward contingencies on a child than he/she uses for himself/herself. All of the subjects encountered an adult model who displayed a lenient self-reward pattern but imposed a stringent reward criterion on the child. Under one set of conditions the model was perceived to control valuable rewards, and under another set of conditions the model was not perceived to have such power. The results demonstrated that children who interacted with a potentially rewarding model adopted a higher standard for self-reward when performing by themselves. Based on these data, it would appear that when a model has control over valued resources observer behavior may be more strongly influenced by what the model says than by what he/she does.

The relationship between model similarity and observer imitative behavior was investigated by Rosekrans (1967). The subjects, 90 boy scouts, viewed a film in which a peer model was presented as being either highly similar or highly dissimilar to the boys in terms of interests, skills, background, and group membership. The subjects watched the model perform specific maneuvers in a simulated war strategy game, and then participated in the game themselves.
Rosekrans found that subjects in the high similarity condition produced significantly more imitative behavior than subjects in the low similarity condition. Furthermore, she discovered that subjects in the high similarity group were able to recall more of the model's specific responses than subjects in the low similarity group. She therefore concluded that, "... perceived similarity to the model affects learning of imitative responses as well as performance of such responses" (p. 314). It would indeed appear that perceived model similarity has a positive influence on the observer's imitative behavior.

According to Kagan (1967), greater attention is directed toward a model with whom one wishes to identify. In an attempt to test this hypothesis, 56 college girls were categorized as being either academically oriented or socially oriented. The girls then listened to a poem read by a model who was presumably similar or dissimilar to themselves. The results showed that recall was greatest when the model was perceived as having similar personality traits. Specifically, the academic subjects recalled more of the poem when it was read by the academic model, and the social subjects recalled more of the poem when it was communicated by the social model. Kagan concluded that, "... an individual will pay more attention to a model who possesses similar personality attributes than to one who is not similar to the subject" (p. 140). He further speculated that
perceived similarity to the model increases observer attentiveness by enhancing the model's distinctiveness.

Hetherington and Frankie (1967) examined the effects of parental dominance, warmth, and conflict on children's imitative behavior. The subjects, 160 nursery and kindergarten children, performed an imitation task after first observing each parent alternately take four trials in a free-play situation. Both parental warmth and parental dominance were found to be salient factors in children's modeling behavior. Imitation in boys was more strongly influenced by parental dominance, while imitation in girls was more dependent on maternal warmth. The results also indicated that under conditions of high-conflict and low warmth, the child tends to identify with the aggressive parent. Based on these findings, it would appear that the model characteristics of warmth and dominance have a differential effect on young children depending upon the child's sex.

McMains and Liebert (1968) studied the imitative effects of model congruity on observers who encounter more than one model for a given behavior. The subjects, 48 fourth graders, were allowed to play with a contrived bowling apparatus, but were strongly encouraged to reward themselves only for very high scores. Under one experimental condition two adult models also adhered to a high standard for self-reward. Under another condition both adult models
rewarded themselves for mediocre scores, and under a third condition one model established a high criterion for self-reward while the other model set a low standard. When permitted to play the game alone, children who observed two stringent models set the highest self-reward standards, and children who witnessed two lenient models chose the lowest self-reward criteria. The children who observed one stringent and one lenient model (discrepant condition) selected an intermediate standard for self-reward. These findings seemed to suggest that the degree to which an observer imitates a model's behavior may be increased when other models perform in a similar manner and decreased when other models behave in a different manner.

In contrast to the results of Mischel and Liebert's (1967) study, research by Bryan and Walbek (1970) supports the contention that observers are influenced more by what a model does than by what he/she advocates. The experimental conditions of their study involved a controlled game in which both the models and the subjects had the option of keeping all of their monetary winnings or donating a portion to charity. The fourth grade children were exposed to one of four models, who took either a generous or a non-generous verbal position which was either consistent or inconsistent with his/her actions. The findings revealed that a model's generous actions increased the proportion of child donors. Also, the results indicated that behavioral example
is more effective than verbal exhortation for eliciting generous responses from observers. It is recalled that in Mischel and Liebert's investigation the model's words outweighed his/her actions only when he/she was perceived to control valued resources. Apparently, under conditions in which the model does not possess unusual power, his/her behaviors have a stronger modeling influence on observers than his/her recommendations.

In another discussion of this same phenomenon Bryan (1970) contends that, "... it is clear that behavior is affected by modeling, but apparently neither boys nor girls are affected in their behavior by the exhortations of the model" (p. 71). He further suggests that while a model's words may determine his/her attractiveness, a model's actions have a greater influence on children's imitative behavior. This concept, if substantiated through further research, would appear to have important implications for both parents and teachers in terms of shaping desirable behaviors in their children and students.

An investigation by Wolf and Cheyne (1972) compared the effects of a live behavioral model, a televised behavioral model, and a live verbal model on the rule-violating behavior of second and third grade children. In each experimental condition, a peer model either disobeyed or conformed to the experimenter's instructions not to play with a particular toy. Relative to a no-model control group,
children exposed to a deviant model exhibited more rule-breaking behavior and children exposed to a conforming model displayed less rule-breaking behavior. Of greater interest to the investigators, however, was the finding that the effectiveness of both the deviant and conforming models was determined in large part by the mode of presentation. Observation of a live behavioral model or a televised behavioral model elicited the greatest number of imitative responses whereas exposure to a live verbal model produced the least imitative behavior. These results appear to support Bryan and Walbek's (1970) contention that observers are more strongly influenced by a model's actions than by his/her words.

Rice and Grusec (1975) compared the effects of a model's performance and a model's recommendations on the subsequent behavior of observers. The subjects (third and fourth grade children) saw an adult model either enact or discuss certain behaviors, such as donating money to charity or acting aggressively with toys. Both the performance model and the verbalization model proved to be equally effective in producing aggressive responses. Also, under conditions in which the experimenter had previously suggested donating money to charity, the performance model and verbalization model both elicited the same degree of imitative behavior. However, when sharing behavior was not mentioned by the experimenter, the performance model
had a greater influence than the verbalization model. Furthermore, donations under the latter condition were more similar to the amounts actually given by the model. With regard to this finding, the investigators suggested that conditions which lead to approximation may contain a higher degree of information value than conditions which lead to precise matching behavior. In view of Bryan and Walbek's (1970) results, one might speculate whether the verbalization model would have produced the same effects if the model had acted in a manner contrary to his recommendations.

A study by Rosenhan (1970) attempted to discover what causes one child to remember and model a parent's consistency while overlooking apparent inconsistency, and another child to react to a parent's hypocrisy while disregarding apparent consistency. The results indicated that respondents who experienced a positive relationship⁶ with their parents tended to remember and imitate those parental behaviors that were consistent with expressed social values. On the other hand, respondents who experienced a negative relationship were more likely to disregard apparent consistency.

⁶Although not defined by the author, it is the assumption of the reviewer that a positive relationship is one in which the child and his/her parents experience a relatively high frequency of interactions and/or a relatively high frequency of agreements. Conversely, a negative relationship is assumed to be one in which the child and his/her parents have a relatively low frequency of interactions and/or a relatively low frequency of agreements.
relationship with their parents seemed to remember mainly those parental behaviors that were hypocritical and inconsistent with expressed social values. It would therefore appear that the quality of the relationship between the model and the observer has a salient effect on the latter's imitative behavior.

Masters (1972) investigated the effect of a model's perceived competence (i.e., skill at a game) on the imitative behavior of young children. Under three conditions of social comparison, four-year-old children received more, fewer, or the same number of rewards as an adult model. The adult model subsequently displayed a variety of specific behaviors and contributed some of his rewards to charity. Masters found that children who received more rewards than the model demonstrated significantly less imitative behavior. Because these children reduced their imitation of highly divergent behaviors, he suggested that they had rejected the model as a model. Apparently, the relative competence of a model may have both a specific and a general influence on the imitative behavior of his/her observers.

The concept of gender and its relationship to young children's attention to models of the same sex was investigated by Slaby and Frey (1975). First, the children (mean age 50 months) were assessed on their comprehension of gender identification, gender stability over time, and gender
consistency across various situations. Each child then viewed a short, silent color film in which a man and a woman participated in simple, parallel activities, such as playing musical instruments. As the child watched the movie, his/her eye movements were recorded by a concealed observer. The findings revealed a positive relationship between the child's level of understanding of gender constancy and his/her attention to the adult model of the same sex. Gender constancy was also shown to be a better indicator of selective attention than the child's age. The investigators postulated that children at more advanced levels of gender constancy may direct more attention to the model whom they perceive as being similar to themselves.

The effects of model stigma, model friendliness, and model affect on an observer's imitative behavior were investigated by Fisher and Harris (1976). The procedures for all three studies involved a model and subject who estimated the prices of five items in a simulated shopper survey. In the model stigma condition, the model wore a patch over one eye. In the model friendliness condition, the model approached the subject and asked for the time in a warm, friendly manner. In the model affect condition, the model expressed (verbally and nonverbally) pleasure at being asked to participate in the survey. Compared to a no-model control group, the subjects exposed to a model tended to imitate the model's responses. While the specific
characteristics of the model did not have a significant effect on observer imitation, observer learning (remembering the model's exact responses) was influenced by the model's characteristics. This finding led the investigators to conclude that those model characteristics which increase an observer's attention to the model may also increase his/her learning (retention) of the model's behaviors. Apparently, characteristics which enhance a model's distinctiveness cause the observer to be more attentive to the model, and thereby increases the probability that the model's responses will be remembered.

This section will close with a list of factors which seem to increase a model's influence over his/her observers. According to Bronfenbrenner (1970), the model's influence is enhanced when:

1. The model is perceived as possessing a high degree of competence, status, and control over resources.
2. The model has given a high degree of nurturance or reward to the observer.
3. The model is a major source of support and control in the observer's environment.
4. The model is perceived as being similar to the observer.
5. Other models exhibit similar behaviors.
6. The model's behavior is a salient feature in the actions of a group to which the observer already is or aspires to be a member.

7. The reinforcing consequences for the model's exhibited behavior are seen by the observer. With the exception of matching one's actions to one's advice, Bronfenbrenner's list appears to include those characteristics of a model which have been shown to affect observers' imitative behavior. Based on the existing modeling research, it would seem reasonable to conclude that a model who is thought to possess a high degree of competence, status, and control over valued resources will most strongly affect the imitative behavior of his/her observers.

**Discrimination Among Models and Modeled Behaviors**

Staats (1968) suggests that the act of matching one's behavior to the behavior of someone else is reinforcing in and of itself. If this were true, however, people would tend to model the behavior of others rather indiscriminantly. It is reasonably clear, according to Bandura (1971), that people are actually quite selective in their choice of imitative behavior. As illustrated in the preceding section, models who exhibit a high degree of status, competence, control over resources, nurturance, similarity, and consistency are imitated more than models who are deficient in these qualities. It would appear, therefore,
that merely matching another's response (response similarity) is not sufficiently rewarding to account for modeling behavior. Indeed, Bandura's hypothesis that people tend to regulate their behavior on the basis of anticipated consequences seems considerably more plausible.

Kanareff (1960) believes that although young children are often indiscriminately reinforced for producing match-responses, an individual must eventually learn to discriminate among situations in which imitation is appropriate and those in which it is not. He contends that:

... the individual may be required rather to form judgments of the likelihood that imitation would be legitimate in a given social situation and classify social situations on the basis of such judgments (p. 340).

Thus, if Kanareff's hypothesis is correct, certain social conditions should produce more imitative behavior than others.

An experiment conducted by O'Connell (1965) examined modeling behavior under conditions of cooperation and competition. In the cooperative situation, two teammates worked together to earn as many points for their team as possible. If they chose separate answers only one answer could be correct (resulting in a single point), whereas if they agreed on an answer they could both be correct (resulting in two points). In the competitive situation, each individual attempted to attain more correct answers than his/her opponent. Only when they chose separate answers
could one individual outscore the other. It was hypothe-
sized that matching behavior would occur more often under cooperative conditions than under competitive conditions. As predicted, the results revealed that the frequency of imitation was significantly greater under conditions of co-
operation. Consequently, it would appear that observers can discriminate between those situations in which imitation is appropriate (reinforced) and those in which it is not. It should not be assumed, however, that all coopera-
tive situations are discriminative stimuli for modeling be-
behavior, nor that all competitive situations are discrimina-
tive stimuli for non-imitative behavior.

Another experiment involving modeling discrimination was performed by Wheeler and Arrowood (1966). The subjects were assembled into four-man groups in which each partici-
pant responded, aloud and in a fixed order, to a highly ambiguous stimuli. Under one condition (agreement), the fourth respondent gave the same answer as the third respon-
dent on most trials. Under the disagreement condition, the fourth respondent usually produced a different answer from the others. The findings showed that under conditions of disagreement the second respondent imitated the first re-
sonian significantly less often than would be expected by chance alone. However, in the agreement condition the frequency of imitation by the second respondent attained only "marginal significance statistically," according to
the authors. Apparently, even though both experimental conditions produced some discriminative modeling behavior, the subjects may have previously learned that imitative behavior is generally not appropriate in competitive testing situations.

It is not uncommon for an observer to recall specific task-related information better than the person who actually performed the task. Rosenbaum (1967) investigated this phenomenon in a study involving performance on a maze test by elementary school children. Under a variety of conditions, observers were found to retain more information than performers, and subjects who did not verbalize but heard another child call out the numbers did better than those who did verbalize. It would seem, therefore, that the observers were better able to discriminate task-relevant information than were the performers. Rosenbaum indicated that because the performer had to decide among various responses, do the necessary motor activity, call out the numbers, and attend to the time signal, he/she may have been less able to focus on specific cues. This type of situation apparently provides the observer with a distinct advantage over the model in terms of attending to and discriminating task-related information.

Wapner and Cirillo (1968) investigated the effects of an observer's age on his/her ability to discriminate and imitate a model's behavior. The investigators equally
divided 240 children into six age groups (8, 10, 12, 14, 16, and 18 years). The subjects faced a model and attempted to copy a variety of hand movements. It was hypothesized that with increasing age the number of mirror responses would decrease and the frequency of transposition responses would increase. The results confirmed this hypothesis, and indicated that the capacity to coordinate one's own perspective with that of the model increases with age. It would appear, therefore, that the ability to discriminate a model's behavior is influenced by the age of the observer.

Fouts and Liikanen (1975) investigated both the effects of age and developmental level on imitative behavior in young children (five to eight years of age). Developmental level was assessed by examining the children's arrangements of various sets of toys. Each child was first exposed to a modeling film in which the experimenter manipulated stimulus objects in novel ways, and subsequently permitted to play with the stimulus objects as well as

7 A mirror response means that, when facing each other, if the model points sideways with his/her left hand, the observer will point sideways with his/her right hand (both are pointing in the same direction). A transposition response means that, when facing each other, if the model points sideways with his/her left hand, the observer will point sideways with his/her left hand (both are pointing in opposite directions).
other toys. The results revealed differential modeling behaviors for children of different ages and developmental levels. More specifically, younger children at a higher developmental level and older children at a lower developmental level tended to perform more imitative behavior than children with reverse characteristics. The investigators suggested that the differential effects of age and developmental level on imitative behavior may have implications for teaching and learning situations for children in this age range.

According to Bandura and Barab (1971), an observer will soon learn to discriminate between rewarded and non-rewarded imitative behavior. During the first phase of their study, children were reinforced for matching a model's motor responses until they exhibited a high degree of imitative behavior. In the second phase, the children were reinforced for imitating the motor responses of one model but not for imitating the motor responses of another model. The results showed that the behavior of the rewarding model was imitated much more frequently than that of the non-rewarding model. The investigators concluded that, "... discrimination processes play an influential role in non-reinforced imitation" (p. 251). In other words, when modeling behavior receives differential consequences, the observer will probably discriminate and eliminate non-rewarded imitations.
On the other hand, Steinman (1970) contends that the transition from generalized imitation to differentiated imitation is not always easy. He submits that modeling discrimination is especially difficult where two reinforcement systems are concurrently operative. For example, a student may be placed in a large tennis class in which he/she is exposed to two instructors. One instructor models a relatively conservative, defensive style of play, and the other instructor exhibits a relatively risky, offensive style of play. Consequently, the student may have considerable difficulty deciding which instructor's playing style to imitate. It is quite likely that during this decision-making process the student will exhibit variable combinations of both playing behaviors, and show a lack of precise modeling discriminations.

This section will conclude with some remarks on discriminative imitation by Bandura and Barab (1971):

A variety of stimulus events can assume discriminative functions in signifying probable outcomes resulting from imitative behavior. People are often differentially reinforced for matching the behavior of models who differ in status, power, competence, age, sex, and a variety of other attributes. Model characteristics, therefore, often serve as discriminative stimuli for likely reinforcement contingencies. Differential consequences also often accompany different activities. Thus, for example, parental models are quick to reward their children for emulating achievement behavior, but they are inclined to discourage imitation of their martini drinking or cigarette smoking. Probable consequences can thus be conveyed by distinguishable features of the modeled behavior.
itself. Through a similar process of selective reinforcmcnt, situmational, temporal, and other cues likewise acquire informative value (p. 245).

Clearly, learning to make appropriate and precise discriminations among models and modeled behaviors is an important process which should be given greater consideration by parents and teachers, as well as educational researchers.

Modeling in the Classroom

Koran (1969b) compared the effects of telling teachers how to teach and presenting teachers with a video-taped model of the desired teaching behavior. The subjects were 33 female elementary education majors who had completed the same sequence of education courses. The results showed that subjects who viewed the video-taped model scored significantly higher on measures of the target teaching behavior than subjects who received specific instructions. Based on these findings, Koran indicated that the utilization of video-taped teaching models should be given greater consideration in teacher preparation programs.

Another study by Koran (1970) compared the effects of observational learning and self-rating on the acquisition and retention of a specific teaching behavior. In this

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For the purpose of this study, self-rating means that the student evaluates his/her own responses by means of a written model.
study, there was no difference between the two experimental conditions in terms of behavior acquisition. However, the results did suggest that video-taped models may be superior to self-rating techniques for the retention of a specific teaching behavior. Koran postulated that this finding may be due to the conceptual characteristics of modeling or to certain associated motivational elements.

The constructive utilization of peer models was investigated by Csapo (1972). An elementary classroom in which several children were labeled as behavior problems (considered emotionally disturbed) provided the setting for his study. Each emotionally disturbed child was told that in order to help him/her learn new behaviors, a fellow student would sit beside him/her and serve as a model. All he/she had to do, if he/she forgot what the teacher expected, was look at the peer model and try to imitate his/her behavior. Whenever his/her behavior was appropriate the peer model would award him/her a plastic chip. The results showed that, in each case, the emotionally disturbed child increased his/her appropriate behaviors and decreased his/her inappropriate behaviors. One of the students whose behavior improved rapidly remarked, "Boy, that's easy. Now I just look at Tom and I know right away what to do. Before, I was lost most of the time because I didn't always listen to directions" (p. 24). Csapo found that peer modeling behavior was not limited to the classroom, but occurred
outside the classroom as well. He also found, happily, that the paired relationships did not increase the frequency of inappropriate behavior on the part of the peer models. Although the plastic chips had no exchange value, Csapo believes they were significant because of the peer social reinforcement which accompanied each of them.

Csapo's research seems to support Williams and Anandam's (1973) contention that, "Students tend to imitate peers who are closer to them" (p. 96). Apparently, proximity to the model has a salient influence on the observer's imitative behavior. It also illustrates the potential value of incorporating peer modeling techniques in the classroom. Certainly, this is an important aspect of modeling that deserves careful and serious research.

Ringer (1973) notes that research literature has not given much attention to training teachers in the use of behavior modification techniques. Furthermore, the existing training programs usually consist of formal instruction. Ringer advocates an alternative training method such as modeling because it offers proof that behavioral techniques are both feasible and successful in the classroom. He suggests that an experienced token helper (i.e., one who awards tokens to students who are behaving appropriately) can design a class reinforcement program and train the teacher in its use through modeling and instruction.
The effects of modeling on the teaching behavior of student teachers were examined by Zevin (1974). In this study, student teachers were assigned to a cooperating teacher who exhibited one of two instructional styles:

1. Fluid, inquiry-type teaching style.
2. Lecture-recitation teaching style.

All of the student teachers were strongly encouraged by their college supervisor to utilize an inquiry-type approach to teaching. During the course of the five-month practicum, the student teachers conformed more and more closely to the instructional patterns of their cooperating teachers. The results showed that when cooperating teachers exhibited a lecture-recitation teaching approach, the student teachers developed a lecture-recitation teaching approach. This modeling behavior occurred in spite of the advice, example, reward or any other stimulus offered by the college supervisor to adopt an inquiry style of teaching.

Although Zevin did not indicate why the student teachers may have modeled their cooperating teachers so closely, it is possible that one or more of the following model attributes was a significant factor:

1. The cooperating teacher had a high degree of status in the classroom setting.
2. The cooperating teacher exhibited a high degree of teaching skill.
3. The cooperating teacher possessed control over valued resources.
4. The cooperating teacher showed a high degree of nurturance to the student teacher.
5. The cooperating teacher had a high degree of proximity to the student teacher.
6. The cooperating teacher was perceived as being similar to the student teacher.

It is also conceivable that the students never saw their college supervisor engage in classroom teaching. Consequently, the verbal model advocated by the college supervisor may not have been as effective as the live model demonstrated by the cooperating teacher. Based on the results of this study, it would seem clear that supervisors who want their students to develop a particular teaching technique should select cooperating teachers who exhibit the desired style of teaching.

Clark, Macrae, Ida, and Smith (1975) studied the effectiveness of a teacher training package for developing a variety of classroom teaching skills. The training package was designed for use with student teachers and included five components:

1. Written instructions describing each teaching skill.
2. Modeling of each teaching skill by the regular teacher.
3. Student performance of the teaching skill.
4. Verbal feedback from the regular teacher.
5. Consequences (graphic feedback, grades, and quizzes) administered by the college supervisor.

The results indicated that the teacher training package was an effective program for establishing the use of a variety of teaching skills by student teachers. It was also found that the interns achieved appropriate use of most teaching skills prior to contact with the special contingencies (component five). Consequently, the investigators concluded that special contingencies may not be essential for the acquisition of teaching skills. It is quite possible, however, that the verbal feedback from the regular teacher provided a strong, reinforcing contingency for the student teachers.

Kirigin and her co-workers (1975) describe the Achievement Place research project which has been developed to train couples to be effective teaching-parents. Teaching-parents live in a large home with six to eight delinquent adolescents, and are responsible for teaching the youths acceptable patterns of behavior for home, school, and community living. Although the Achievement Place model involves a comprehensive token economy, it has been found that point consequences alone are not sufficient to teach desirable behaviors if such behaviors are not present in the youth's repertoire. The authors suggest that desirable
behaviors are best acquired through effective teaching episodes with the teaching-parents.

Kirigin and her fellow researchers have identified eight behavioral components which they believe should be included in the teaching interactions:

1. Initial praise for some aspect of the youth's behavior.
2. Clear description of the inappropriate behavior.
3. Rationale for learning an alternate, appropriate behavior.
4. Clear description of the appropriate behavior, often including modeling of the behavior.
5. Specification of point consequences.
6. Request for acknowledgment from the youth.
7. Practice, followed by feedback from the teaching-parents.
8. Final praise for performing the appropriate behavior.

As illustrated in step four, it may be necessary for the teaching-parents to model the appropriate behaviors. According to Kirigin, "Such demonstrations seem to enhance the verbal description and help minimize possible misinterpretation of the behavior that is required of the youth" (p. 165).

Although modeling is a technique often used in education, Smith and Lovitt (1975) note that the majority of
modeling research has been conducted in non-academic settings. They designed a study to examine the effects of permanent models on the acquisition of arithmetic skills by elementary school children. The permanent model was a sample problem which the teacher worked out at the top of a student's worksheet as the student observed. The results showed that computational behavior changed immediately and remained at a high level of performance whenever the demonstration-plus-permanent-model technique was applied. Smith and Lovitt concluded that the demonstration-plus-permanent-model technique could easily be applied to other areas involving written responses, but felt that demonstration alone might be a more appropriate modeling procedure for areas involving nonwritten responses. Perhaps their conclusion is correct, but it would seem feasible that a demonstration-plus-permanent-model (i.e., picture sequences or illustrations) would also facilitate the acquisition of physical skills to a greater degree than demonstration alone.

Brody and Zimmerman (1975) examined the effect of modeling on the personal space of elementary school children. The children attended either an open-classroom or

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9Personal space refers to the space surrounding a child which he/she does not wish to share with others.
a traditional school. Pre-test data revealed that students from open-classrooms reported closer approach behavior towards peers and adults than children from traditional classrooms. All of the students were exposed to a filmed modeling episode in which a teacher interacted with two students. Half of the students from each classroom witnessed a proximate teaching situation (one foot separation), while the other half viewed a distant teaching situation (five feet separation). It was found that students who observed the proximate teaching situation significantly decreased their reported personal space, whereas the children who watched the distant teaching situation made no significant changes in their reported personal space. The results of this experiment indicated that a brief exposure to modeled behavior may be sufficient to modify children's attitudes toward personal space. It would be interesting to investigate the effect of modeling on the disinhibition of other classroom behaviors, such as volunteering to answer questions, reading to others, speaking before a group, attempting new physical skills, and discussing feelings.

Although relatively little modeling research has been conducted in classroom settings, the studies which have been completed indicate that modeling procedures can have a significant influence on students' attitudes, achievement, and behavior. The incorporation of peer models seems to be a powerful technique for improving classroom climate, and
is an aspect of modeling which should be promptly and carefully researched. Another promising area for research appears to be the use of filmed models for reducing various student inhibitions. Also, the high degree of imitative behavior that cooperating teachers apparently elicit from their student teachers would seem to have numerous implications for researchers and teacher educators alike. Undoubtedly, modeling occurs in one form or another in every classroom. However, the deliberate use of models for the purpose of effecting positive changes within the classroom is a challenge which appears to be well worth the effort.

**Symbolic Models**

Bandura and Mischel (1965) investigated the relative effectiveness of live and symbolic models for altering children's behavior patterns. Children who preferred immediate but less useful rewards were exposed to models who exhibited delay-of-reward behavior, and children who chose to wait for more valuable rewards observed models who placed highest priority on immediate gratification. One group of children encountered live models, another group was exposed to symbolic models\(^{10}\), and a third group did not observe any

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\(^{10}\)In this investigation, the symbolic model was a written record of another person's choice of reward.
models. Exposure to both live and symbolic models resulted in marked changes in the subjects' reward behavior in the direction of the model's responses. Although there were no significant differences between the live and symbolic models in terms of the immediate post-modeling evaluation, the changes in reward behavior induced by the live model were more stable over time. While live models may produce longer lasting effects, it seems reasonably clear that exposure to symbolic models can also have a significant influence on an observer's imitative behavior.

Jones (1965) examined the effects of a symbolic model and mental practice on the acquisition of a gymnastics skill. Seventy-one male college students were given six sessions of mental practice directed towards performing a kip-up on the horizontal bar. Under one training condition the subjects engaged in mental practice directed by the instructor, while under a second training condition the mental practice was self-directed. In all cases the symbolic model was a written analysis of the skill. The results showed that:

1. Physical practice is not necessary for learning a gross motor skill (kip-up).
2. Exposure to a symbolic model and mental practice are sufficient conditions for learning a gross motor skill (kip-up).
Based on these findings, it would appear that exposure to a symbolic model can have a facilitating effect on the learning of a physical skill.

A study by Koran (1971) investigated the effects of written and film-mediated models on the acquisition of a specific teaching behavior. The two treatment conditions were defined as follows:

1. Written Model- Exposure to a written model means that the learner has read a written transcript of the sound track of a film-mediated model in which the behaviors to be acquired are capitalized or underlined for highlighting.

2. Film-Mediated Model- Exposure to a film-mediated model means that the learner has observed the actual filmed performance of another person who displayed behaviors to be acquired.

Although a variation in pre-test scores precluded the possibility of making between-group comparisons, Koran noted that, "... the film-mediated group reached what might be considered a ceiling for the task to be learned, whereas the written modeling group never did acquire the skill to as high a level" (p. 49). Nonetheless, it would be unfair to conclude that the film-mediated model was superior to the written model since no statistical analyses were performed on the data.
Young (1969) examined research studies which had compared the effects of perceptual modeling\textsuperscript{11} and symbolic modeling on the acquisition and performance of teaching skills. In most cases, a video-taped teaching episode served as the perceptual model, and a detailed set of written instructions served as the symbolic model. Young concluded his review with four statements which he believes are supported by experimental research (p. 402):

1. Modeling as a training variable has been demonstrated effective in modifying behavior.
2. Video-taped models are most effective when a supervisor provides discrimination training (i.e., points out relevant behaviors as they occur) while a teacher is viewing or when such discrimination training is provided by the addition of auditory and visual cues on the tape.
3. Models featuring only positive instances of teaching behavior have been demonstrated to have a greater transfer to teaching situations other than the one in which training occurred.

\textsuperscript{11}Exposure to a perceptual model means that the subject has observed an actual demonstration of the specific skills to be acquired. Exposure to a symbolic model (only) means that the subject has received an explanation of the skills but has never witnessed a performance of the skills.
4. Listening to an audio-taped model with a typescript and subsequently verbalizing the model teacher's indirect verbal behavior effected significant behavior changes in the predicted direction.

In contrast to Koran's (1969b) results, a study performed by Allen, Berliner, MacDonald, and Sobol (1967) demonstrated that symbolic models were as effective for changing teaching behavior as perceptual models. According to Allen and his associates:

> It appears that for a verbal skill, such as higher order questioning, the video technology used to present the model may be superfluous, and that training may be readily accomplished through written models (p. 19).

Although Koran's (1969b) investigation was included in the previous section (Modeling in the Classroom), it is obvious that he also compared the effects of perceptual modeling (showing teachers how to teach) and symbolic modeling (telling teachers how to teach). Since Koran found perceptual modeling to be a more effective instructional technique, there is a discrepancy between his results and those presented by Allen. There are a number of variables, however, which may have contributed to the contradictory conclusions. For example, in the perceptual modeling conditions the characteristics of the models (i.e., status, competence, control over resources, perceived similarity, etc.) may have had differential effects on the observers. Also, one group of subjects may have received a higher degree of
discrimination training and were thus better able to select task-relevant behaviors. In addition, different contingencies of reinforcement may have had a significant influence on the observers' performance of the modeled behaviors. Furthermore, it is possible that the degree to which the teaching tasks were made specific may have affected the results. Whatever the reasons for the incongruity of the findings, it would seem evident that more research is needed on the relative effectiveness of perceptual and symbolic models. Although symbolic modeling techniques do appear to elicit imitative behavior, the comparative merit of perceptual models and symbolic models is apparently yet to be resolved.

Imitative Aggression

Much of the early modeling research investigated the effect of aggressive models on the subsequent behavior of children. Undoubtedly, many of these studies were undertaken to determine the consequences of viewing aggressive behavior via television. One of the central issues was whether televised aggression would increase (prompt) or decrease (serve as a catharsis for) the aggressive behavior of the observer.

An early investigation of aggressive behavior in young children was performed by Levin and Sears (1956). In their study, 379 five year old children engaged in two
20-minute sessions of doll play. The children's specific behaviors were categorized as either aggressive acts or neutral acts. The findings indicated that boys who identified\textsuperscript{12} with an aggressive parental model emitted a higher frequency of aggressive acts in doll play. The results also suggested that girls who identified with a nonaggressive parental model displayed a lower level of doll play aggression, but that exposing girls to an aggressive role model increased their aggressive behavior in doll play.

Lovaas (1961) investigated whether exposure to an aggressive movie would increase or decrease a child's subsequent aggressive behavior. Immediately after viewing the film, the children were placed in a doll play situation in which their aggressive responses could be observed and recorded. The results showed that aggressive doll play behavior increased following exposure to an aggressive movie. Based on this finding Lovaas concluded that, "... aggressive films are likely to make children more aggressive rather than less aggressive" (p. 43).

The effects of animated cartoons on children's aggressive play behavior were investigated by Mussen and Rutherford (1961). One group of first grade children

\textsuperscript{12}The child's degree of parental identification was assessed through interviews (using standardized sets of questions) with the child's mother.
viewed an aggressive cartoon, another group observed a nonaggressive cartoon, and a third group had no exposure to cartoons. After receiving their respective experimental treatments, the children's level of aggression was assessed in terms of their desire to "play with" or "pop" a large balloon. The results indicated that exposure to aggressive cartoons increases children's tendencies towards aggressive play behavior.

In an experiment by Bandura, Ross, and Ross (1961), children were exposed to an aggressive or nonaggressive adult model and subsequently tested for imitative behavior in the absence of the model. In the nonaggressive condition the four year old children observed an adult model who quietly assembled tinker toys. By contrast, in the aggressive condition the model began to build tinker toys but promptly turned to a Bobo doll and directed verbal and physical aggression towards it. When left alone, children who had witnessed the aggressive model imitated a large percentage of his aggressive responses (both verbal and physical) with a high degree of precision. This result led the investigators to conclude that exposure to an aggressive model increases the probability of aggressive behavior by the observers.

Another investigation by Bandura, Ross, and Ross (1963c) compared the effects of live and filmed models
on the aggressive behavior of nursery school children. One group of children witnessed a real-life aggressive model, another group viewed the same aggressive model on film, a third group observed an aggressive cartoon model, and a fourth group had no exposure to aggressive models. The results showed that all three experimental groups exhibited significantly more aggressive behavior than the no-model control subjects. Furthermore, the findings indicated that live and filmed models were equally effective in eliciting imitative aggressive behavior from observers.

A study by Berkowitz and Rawlings (1963) investigated the effects of film violence on subsequent aggressive tendencies in adult subjects. Prior to viewing a seven-minute fight scene, 160 college students were provided with a brief synopsis of the background situation. In one condition (justified aggression), the subjects were informed that the character who received a severe beating was a downright scoundrel. Subjects in the other condition (less justified aggression) were told that the same character was not really a bad person. Students in both groups were subjected to the remarks of an insulting male graduate student before observing the movie episode. After watching the filmed fight scene, the subjects' hostility towards the insulting graduate student was assessed by means of a rating questionnaire. The results showed that subjects in the justified aggression condition reported
stronger feelings of animosity towards the insulting graduate student. With respect to this finding, the authors concluded that, "Seeing the fantasy villain 'get what he deserved' may make the angered individual more inclined to hurt the villain in his life, the person who had angered him" (p. 411).

Hicks (1965) exposed four groups of children (average age five years) to one of four filmed models of aggressive behavior (peer male, peer female, adult male, adult female). His results indicated that all four models were highly effective in increasing children's aggressive responses. He also found that exposure to an adult male model had the longest lasting influence on the children's aggressive behavior. Hicks concluded that, "The exposure of children to aggressive films appears to remain a relevant antecedent in shaping the form of aggressive responses for a considerable length of time" (p. 100).

A study by Kuhn, Madsen, and Becker (1967) examined the effects of frustration and exposure to an aggressive model on children's subsequent aggressive behavior. Twenty children were assigned to each of four experimental conditions. Under the frustration condition, the child was not given candy which had been promised to him/her. Under the aggressive model condition, the child observed a five-minute film in which an adult model behaved aggressively
toward a Bobo doll. In a combined frustration-aggressive model condition, the child observed the same aggressive film and did not receive the candy he/she had been promised. Children in the neutral condition were neither frustrated nor exposed to an aggressive model. The results showed that exposure to the aggressive model elicited imitative aggressive behavior from the children, but that the frustration experience did not increase the amount of displayed aggression. In fact, the investigators found that the children's emotional reactions to the frustration operation (i.e., pouting) tended to interfere with their modeling responses. It would appear, therefore, that exposure to an aggressive model is a sufficient condition for eliciting aggressive imitative behavior from children.

Goranson (1970) conducted a review of the research related to media violence and aggressive behavior. He concluded that children do indeed learn aggressive behavior sequences through exposure to aggressive models on film or television. However, according to Goranson, the likelihood of imitative aggression is partly determined by the similarity of the modeled situation to the observer's situation. He also believes that imitative aggression is quite cue-specific, and is most probable when children encounter cues in real life that are highly similar to those observed in the modeled episode. Furthermore, Goranson contends that realistic aggressive models are more apt to elicit imitative
behavior from observers than are animated cartoon characters.

Although Bandura, Ross, and Ross (1963c) found that a cartoon model was as effective as a live model for eliciting imitative aggressive behavior from children, the setting in which the children performed was very similar to that in which the model performed. Consequently, the cues observed in the modeled episode were also relevant to the play situation in which the children were placed. It would therefore seem that the results obtained by Bandura, Ross, and Ross are consistent with the cue-specific concept of modeled aggression proposed by Goranson.

Based on the studies examined in this section, the following concluding statements would appear warranted:

1. Exposure to aggressive models (live or filmed) increases the probability of aggressive behavior by the observers.
2. Aggressive behavior may have a stronger modeling effect when the model's actions are presumably justifiable.
3. Prior frustration does not seem to increase imitative aggressive behavior on the part of the observers.
4. Similarity between the modeled situation and the observer's real situation tends to increase the latter's imitative behavior.
If the concept of cue-specificity (number four above) also applied to nonaggressive behaviors (i.e., seat work), it would undoubtedly have important implications for teachers and school personnel. For example, if teachers and key students modeled particular behaviors in particular settings (i.e., language laboratory, library, lunchroom, playground, etc.) a variety of student behaviors could conceivably become cue-specific. In operant terminology, by modeling and reinforcing certain behaviors in certain settings, these settings would eventually become discriminative stimuli for performing the appropriate behaviors.

Imitative Altruism

A number of investigators have also studied modeling and imitation of nonaggressive behaviors. In particular, several researchers have examined the influence of altruistic models on the degree of helping behavior subsequently displayed by observers.

Rosenhan and White (1967) investigated the effects of an adult model on the prosocial\textsuperscript{13} behavior of children. One hundred and thirty fifth grade boys and girls participated in a simulated bowling game in which they, and

\textsuperscript{13}In this context, prosocial behavior refers to donating a portion of one's monetary winnings to charity.
the adult model, frequently earned five-cent gift certificates. The players were given the option of contributing a portion of their certificates to charity, and they observed that the model consistently donated half of his certificates to charity. The results indicated that exposure to a giving model elicits more altruistic behavior on the part of the observers than occurs under similar circumstances without a model. According to the investigators, "... it is clear that observation of a model is one powerful determinant of altruistic behavior" (p. 429).

Similar results were obtained in each of four experiments performed by Bryan and Test (1967). Three of the investigations involved charitable contributions to the Salvation Army kettle under conditions of an altruistic model and no model. The findings repeatedly demonstrated that the presence of a benevolent model significantly increased the observers' subsequent altruistic behavior. The model-present condition for the fourth experiment was a man changing a tire for a woman whose car obviously had a flat. A quarter-mile down the road another woman was standing beside her car, which also had a flat tire. Of 4000 passing vehicles, 58 stopped to render assistance in the model-present condition and 35 offered to help in the model-absent condition. Upon analyzing the results the authors concluded that, "... helping behavior can be significantly increased through the observation of other's helpfulness"
(p. 402). Although it is clear that more offers of assistance were received under the model-present condition, the extremely small percentage of helpers indicates that the altruistic model did not really have a very strong effect on passing motorists.

In another study on altruistic behavior, Test and Bryan (1969) asked 80 college coeds to compute and rate a series of arithmetic problems. One group of subjects observed a helping model, another group witnessed a non-helping model, a third group received assistance themselves, and a fourth group received no exposure to a model. Half of the subjects in each treatment condition were subsequently left with a physically disabled person who was apparently experiencing difficulty with the assigned task, while the other subjects were left with a healthy co-worker. In each situation the results indicated that observation of a helping model increases the probability of altruistic behavior by the observer.

Wagner and Wheeler (1969) conducted a study in which, under ostensibly real conditions, 144 Navy enlisted men were asked to donate money to charity. One group of subjects observed a model agree to make a donation, another group overheard a model refuse to contribute, and a third group was solicited in the absence of a model. The results revealed that helping behavior was negatively affected by a selfish model and positively affected by a generous model.
Wagner and Wheeler's conclusion that, "... helping may be decreased by observation of another who refuses help, as well as increased by observation of a helping other" (p. 113) is clearly in agreement with the findings of similar investigations.

Bryan, Redfield, and Mader (1971) investigated the effects of a model's words, deeds, and social reinforcement on the altruistic behavior of second and third grade children. The children were exposed to video-taped models who exhibited various combinations of charitable or greedy verbalizations, charitable or greedy actions, and high or low levels of social reinforcement for self-denial responses. The findings revealed that the model who recommended, practiced, and socially reinforced altruistic behavior elicited the most altruistic responses. Interestingly, children who observed the model that preached and practiced generosity but did not socially reward such behavior produced the fewest altruistic responses. Although both the model's verbal and behavioral support of generosity enhanced his/her attractiveness, the children's imitative altruistic behavior appeared to be largely determined by the degree of social reinforcement provided by the model.

Cox (1974) conducted an experiment to discover whether persons who receive help in a given situation are more

\[14\] For the purpose of this study, altruistic behavior consisted of donating money to a charity for crippled children.
likely to render assistance to others in a similar situation. In this study, 79 middle class eighth grade boys were given varying degrees of assistance with a puzzle assembly task, and subsequently provided with an opportunity to help another boy put his puzzle together. The results demonstrated that helping behavior was positively related to the amount of help the student had previously received on the same experimental task.

Harris and Samerotte (1975) investigated the effects of aggressive and altruistic models on the behavior of shoppers at a large shopping center. The subjects observed a model either politely accept or aggressively refuse the experimenter's request to complete a brief ecology questionnaire. The subjects were then presented with the same request, and later approached by another experimenter who asked them for a dime. The results showed that persons who observed an aggressive model were more aggressive than those who saw no model or an altruistic model. However, subjects who witnessed an altruistic model did not display more altruistic behavior than those in the no model condition. Based on these findings, it would appear that exposure to an aggressive model has a stronger modeling effect than exposure to an altruistic model.

Research conducted by Solomon and Grotta (1976) indicated that models may be more effective under some conditions than others. The investigators simulated a high
level emergency situation and a low level emergency situation in a large supermarket. In the high level emergency situation the experimenter fell to the floor holding his stomach and groaning in pain. In the low level emergency situation the experimenter accidentally dropped a number of small items on the floor. Under one set of conditions a model went to the aid of the experimenter and under the other set of conditions a model was not present.

The findings of this investigation produced mixed results. The presence of an altruistic model elicited more helping behavior from observers in the low level emergency condition, but less helping behavior from observers in the high level emergency condition. According to the authors, when the cost of helping is high, as it would appear to be in the high level emergency situation, observers may tend to avoid involvement by diffusing responsibility to the model. It would seem, therefore, that the presence of an altruistic model does not necessarily increase helping behavior on the part of observers. Apparently, the characteristics of a particular situation have a significant influence on the observer’s reactions to modeled behavior.

The investigations reviewed in this section lend support to the following statements concerning the effects of modeled altruistic behavior:

1. Observation of a helping model generally increases altruistic behavior on the part of an observer.
2. Altruistic behavior appears to be positively related to the amount of help one has previously received in a similar situation.

3. Social reinforcement seems to have a strong influence on one's performance of imitative altruistic behavior.

4. Observation of an altruistic model tends to elicit less imitative behavior than observation of an aggressive model.

5. The presence of an altruistic model may not increase the altruistic behavior of others in situations where the cost of helping is high.

**Vicarious Reinforcement**

According to Rushall and Siedentop (1972), "The process of vicarious reinforcement is an important facet in human behavior, especially in group learning situations" (p. 65). Oftentimes, a person will imitate a specific behavior for which another person (model) has been reinforced. When this occurs, that person is said to have experienced vicarious reinforcement. In simplest terms, the observer reasons that if the model receives reinforcement for performing a particular behavior, perhaps he/she will also.

Bandura (1965c) indicated that through vicarious learning processes an observer can acquire modeled
behavior without performing any overt responses. He defines a vicarious event as:

... one in which new responses are acquired or the characteristics of existing response repertoires are modified as a function of observing the behavior of others and its reinforcing consequences, without the modeled responses being overtly performed by the viewer during the exposure period (p. 3).

Bandura refers to this process as "no-trial learning," but McKenzie (1976) suggests that "one-trial learning" may be a more appropriate term, since one response is necessary to demonstrate that learning has actually occurred. In either case, it should be clear that the observer's decision to perform the modeled behavior is based upon the reinforcement contingencies experienced by the model.

Schein (1954) investigated the effects of rewarding one member of a group on the imitative behavior of other group members. Three-hundred army inductees were assembled into five-man groups and administered an ambiguous oral examination. After each subject, in order, called out his response to the test question, the experimenter would announce the correct answer. On 80 percent of the trials the answer given by the second respondent was designated as correct. Schein found that a significant number of subjects imitated the rewarded model, and that their imitative behavior generalized to a similar situation. These findings indicated that the subjects learned to
discriminate and imitate the appropriate model through the process of vicarious reinforcement.

The only animal study that will be reviewed in this paper was conducted in 1959 by Presley and Riopelle. The subjects were five pairs of adolescent rhesus monkeys. One member of each pair served as the demonstrator, while the other member observed from an adjacent compartment. Each trial was initiated by the illumination of a red light beneath the demonstrator monkey's cage. Four seconds after the light was turned on, the grid on the lighted compartment carried an electric current for 10 seconds. The demonstrator monkey could avoid being shocked by jumping over a barrier within four seconds from the onset of the light. The findings showed that, when the experimental conditions were reversed, the monkeys that had previously been observers learned to avoid the electric shocks in less time than the demonstrator monkeys. This result indicated that the observer monkeys had learned an appropriate behavior for avoiding discomfort through vicarious processes.

The effects of modeling and social reinforcement on children's moral judgment behavior were investigated by Bandura and McDonald (1963). Children (five to 11 years of age) made moral judgments between two alternatives in a number of hypothetical situations. One group of children (model condition) was then exposed to an adult model who expressed moral judgments which were contrary to theirs.
Another group of children (reinforcement condition) had no exposure to a model but received verbal reinforcement whenever they reversed their previous moral judgments. A third group of children (model-plus-reinforcement condition) observed an adult model who expressed opposite moral judgments, and received verbal reinforcement whenever they adopted the model's responses. None of the children were prompted to reverse their prior judgments. The results demonstrated that both the model-plus-reinforcement condition and the model condition were significantly more effective than the reinforcement condition for changing the children's moral judgments. However, contrary to prediction, there were no significant differences between the model-plus-reinforcement condition and the model condition. This finding would seem to suggest that vicarious reinforcement was as effective as direct reinforcement for altering moral judgment behavior in children.

Bandura, Ross, and Ross (1963b) conducted an experiment in which nursery school children reacted to a filmed modeling sequence. One treatment group observed a model who was rewarded for aggressive behavior, another group witnessed an aggressive model who was punished for his behavior, a third group watched highly expressive but non-aggressive models, and a control group saw no models. The results showed that children who viewed the model rewarded for aggressive behavior displayed significantly more
imitative aggressive responses than children in the other groups. This finding led the investigators to caution that televised aggression may have important implications in terms of children's subsequent social behavior. They also found that children who had not performed aggressive behavior (those in the model-punished group) could nonetheless describe the model's aggressive acts with considerable accuracy. This discovery prompted Bandura to perform a similar study incorporating a more comprehensive experimental design.

In a classic follow-up experiment (Bandura, 1965b) children (mean age 51 months) viewed a film in which an adult model performed aggressive behavior toward a large, inflated doll. One group of children witnessed the model being rewarded for his aggressive behavior, another group observed the model being punished for his aggressive behavior, and a third group saw only the model's behavior, and none of its consequences. As might be expected from previous results, children exposed to the model-rewarded condition performed significantly more aggressive responses than children exposed to the model punished condition. However, there were no significant differences between the model-rewarded group and the no-consequences group. This finding led Bandura to conclude that non-punishment of disapproved behavior may affect observers in a manner analogous to positive reinforcement. He also found that
children who did not perform the modeled behavior had none-theless learned the modeled behavior. When motivated by attractive reinforcers to reproduce the model's aggressive responses, children from all three treatment groups revealed an equivalent amount of learning. The addition of direct positive reinforcement, however, did not produce any new responses from the male children in the model-rewarded and no-consequences group.

These results appeared to support three of Bandura's hypotheses. First, the findings indicated that there is a difference between the acquisition (learning) of modeled behavior and the performance of modeled behavior. Second, the findings implied that modeling responses may be inhibited or disinhibited through vicarious reinforcement. In other words, the consequences of a model's behavior may inhibit or disinhibit a similar behavior on the part of the observer. Third, the findings suggested that in some circumstances vicarious reinforcement is as effective as direct reinforcement for eliciting matching behavior from observers.

Marston and Kanfer (1963), and Kanfer and Marston (1963) also found that vicarious reinforcement significantly facilitated learning in observers, with direct reinforcement producing no additional effects. Their results further indicated that the relationship of vicarious
reinforcement to learning may be dependent upon the percentage of the model's responses which receive reinforcement.

Walters and Parke (1964) contend that social control is maintained to a considerable degree through vicariously experienced reward and punishment. Although their study of model-rewarded, model-punished, and no-consequence conditions produced mixed results, they did find that children in the no-consequence group violated a request not to play with attractive toys to the same degree as children in the model-rewarded group. The children in the model-rewarded group had previously seen a film in which the model was rewarded for playing with forbidden toys, whereas the model for the no-consequence group was neither rewarded nor punished after engaging in the same deviant behavior. This finding was in agreement with that of Bandura (1965b), and suggested that a modeling episode in which disapproved behavior is not punished may have a vicariously reinforcing effect on the observers. Since playing with attractive toys is undoubtedly a high probability behavior for most children, it is perhaps not too surprising that children in the no-consequence group violated the playing restriction as often as those in the model-rewarded group.

A study by Berger (1966) demonstrated that direct reinforcement to the observer is not a necessary condition for eliciting imitative behavior. In one experimental
condition the observers imitated the model's responses even though they were told that they would not participate in the experiment, and therefore had little reason to anticipate direct reinforcement. It would appear, then, that the observers' decision to replicate the model's behavior was at least partially dependent upon vicarious reinforcement.

Bandura, Grusec, and Menlove (1967a) examined the effects of vicarious reinforcement on children's dog-avoidance behavior. Children who were fearful of dogs were placed in one of four treatment conditions. In the positive context group, the children merely participated in a party. Children in the exposure-positive context group participated in a party in the presence of a dog (restricted to his pen). In the model-positive context condition, the children participated in a party and observed a peer model play with a dog (in his pen). The model-neutral context condition was identical to the model-positive context condition except that the party was omitted. The results showed that children in the model-positive context condition and model-neutral context condition displayed a significantly greater decrease in dog-avoidance behavior than children in the two no-model conditions. These findings indicated that the children were vicariously reinforced by the model's behavior, and were therefore more willing to imitate his dog-approach actions.
Another experiment was conducted by Bandura, Grusec, and Menlove (1967b) in which the effects of several modeling variables were examined. Children (seven to 11 years of age) were exposed to an adult model who exhibited superior performances in a simulated bowling game, and set a high standard for self-reward. The experimental variables were the degree of nurturance displayed by the model, the presence of a peer model who established a low standard for self-reward, and the degree of social reinforcement received by the model for his high self-reward criterion. The results revealed that:

1. Children who observed the peer model tended to establish lower standards for self-reward.
2. Children who experienced a highly nurturant interaction with the adult model were more inclined to set lower self-reward criteria.
3. Children who witnessed the adult model receive social reinforcement for his high standards imposed more stringent self-reward criteria on themselves.

The findings indicated that exposure to both the higher standards of an adult model and the lower standards of a peer model may have a compromising effect on the self-reward criteria adopted by children. Also, it would appear that a highly nurturant relationship with an adult model may result in more self-indulgence on the part of the child. Finally, the results suggested that seeing
an adult model reinforced for his/her behavior is vicari­ously reinforcing to children and encourages imitation. The authors elaborated on this point by stating that:

... social rewards dispensed to a model produce a higher incidence of matching behavior than exposure to the same modeling cues without any consequences accruing to the model (p. 454).

Apparently, vicarious reinforcement has a positive influence on observers' matching behavior.

Craig (1967) performed an investigation with human subjects that was somewhat similar to the animal experiment conducted by Presley and Riopelle (1959). His study examined the effects of direct reinforcement, punishment, and vicarious reinforcement on the performance of a complex maze task. The model subjects received information for correct responses, and electric shocks for incorrect responses. The observing subjects watched the models as they attempted to solve the maze problem. The results indicated that the shocks facilitated learning in males, but interfered with learning in females. Furthermore, vicarious learning resulted in superior performances by the observers. Craig concluded that, "The opportunity to observe another perform the task clearly facilitated mastery of the tasks of selecting correct switches and avoiding shock switches" (p. 174).

A study by Rosekrans and Hartup (1967) investigated the effects of consistent and inconsistent patterns of model reinforcement on the imitative behavior of nursery school
children. One group of children observed a model who was verbally reinforced for performing aggressive responses, another group observed a model who was verbally punished for exhibiting aggressive behavior, a third group watched a model who was sometimes rewarded and sometimes punished for displaying aggressive behavior, and a fourth group had no exposure to a model. In a subsequent test of imitative behavior, no differences were found between subjects who observed the inconsistently reinforced model and subjects who did not see a model. As expected, children exposed to the inconsistently reinforced model performed more imitative responses than subjects in the model-punished condition, and less imitative behavior than subjects in the model-rewarded condition. Consequently, the investigators concluded that, "Inconsistent vicarious reinforcement (i.e., successive reward and punishment of the model) has a canceling effect on subjects' behavior" (p. 433). It would appear, therefore, that consistency of reinforcement has a salient influence on vicarious learning.

A follow-up study on dog avoidance behavior was performed by Bandura and Menlove in 1968. In this experiment, children with a marked fear of dogs were assigned to one of three treatment conditions. One group of children viewed films in which a model interacted with a single dog. Another group observed films portraying several models with a variety of dogs, and a control group saw a movie in which
there were no animals. All of the children were subsequently tested for dog-avoidance behavior (i.e., standing near the dog, touching the dog, etc.). No changes in dog-avoidance behavior were found in the control children, even though they were informed that the test animals were harmless and friendly. On the other hand, both groups of children who observed the modeling films exhibited significant reductions in their dog-avoidance behavior. The results also showed that children in the multiple-modeling treatment condition performed more potentially threatening interactions with the dogs. It seems reasonably clear that vicarious reinforcement had a significant effect on the children's imitative dog-approach behaviors.

In an investigation by Liebert and Fernandez (1970), one group of girls (ages six and seven) observed a model who was rewarded for her responses to various questions. Another group witnessed a model who was punished for her responses, and a third group watched a model who received no consequences for her answers. As expected, the model-reinforced group performed significantly more matching responses than the no-consequences group, and the model-punished group displayed significantly fewer matching responses. However, on a recall test both the vicarious reward and the vicarious punishment groups were found to produce significantly more matching responses than subjects whose model received no consequences for her behavior.
These findings suggested that when tasks are complex or uninteresting, vicarious consequences to a model tend to enhance learning to a greater degree than modeling without consequences.

Keller and Carlson (1974) examined the effects of filmed modeling episodes on the social behavior of low-interacting preschool children. One group of socially isolated preschoolers (N=10) was shown five-minute videotapes of positively interacting children on each of four consecutive days. A control group of nine low-interacting preschoolers was shown nature films. In addition to changes in their patterns of social interaction, the children were observed for changes in the amount of positive social reinforcement which they gave to others and which they received from others. The results indicated that viewing the filmed modeling sequences had a positive effect on the children's subsequent social behavior. Comparisons between pretreatment and posttreatment assessments revealed significant increases in the level of social interaction, the amount of positive social reinforcement directed to others, and the amount of positive social reinforcement received from others for children in the modeling group but not for children in the control group. Apparently, presenting low-interacting children with filmed models of high-interacting children is an effective means for increasing their social interaction behavior.
In summary, the studies reviewed in this section seemed to indicate that vicarious reinforcement (i.e., seeing a model reinforced for a specific response) is an important factor in modeling behavior. According to Bandura (1969):

> Virtually all learning phenomena resulting from direct experiences can occur on a vicarious basis through observation of other persons' behavior and its consequences for them (p. 118).

Bandura suggests that people attempt new behaviors after observing the positive consequences experienced by a model. Conversely, people avoid many fruitless behaviors by witnessing the negative consequences experienced by a model. Finally, it is clear that the ability to discriminate between appropriate and inappropriate behaviors is facilitated through the process of vicarious reinforcement.

Self-Reward

It appears that vicarious reinforcement has a strong influence on the standards which an observer adopts for rewarding himself/herself. Staats (1968) notes that children differ in the performance standards which they establish.

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15 Self-reward indicates that a person will reward himself/herself (i.e., verbally, materially, etc.) each time he/she attains a self-determined standard of performance. Treating oneself to a milkshake after every three pounds of weight loss would be an example of self-reward behavior.
for themselves. He contends that the differences in performance standards are produced through the children's individual experiences according to the principles of conditioning. Certainly, vicarious reinforcement based on the consequences of a model's performance plays a major role in this conditioning process. As an example, Staats suggests that:

... we may observe a boy alone practicing a certain "move" in football until he is "satisfied", that is, until he has attained some internal standard. The standard stimulus, as one example, may be a conditioned sensory response (image) which the boy has acquired from observing a more skilled player (p. 454).

In other words, the boy has based his standard of achievement (and self-reward) on the performance of a model.

Other researchers have arrived at similar conclusions. Bandura and Kupers (1964) found that subjects (seven through nine years of age) adopted a particular criterion for self-reinforcement as the result of observing a model's standard for self-reinforcement. They also discovered that adults were stronger models than peers in transmitting both standards and magnitudes of self-reward. In conclusion, they stated that:

... subjects will adopt the particular criteria for self-reinforcement exhibited by a reference model, evaluate their own performances relative to that standard and then serve as their own reinforcing agents (p. 8).

Although these findings seem to contradict the results of another study by Bandura, Grusec, and Menlove (1967b), they
may actually be complementary. As reviewed in the previous section (Vicarious Reinforcement), Bandura, Grusec, and Menlove found that children exposed to both the higher standards of an adult model and the lower standards of a peer model would tend to select an intermediate level for self-reward. Bandura and Kuper's (1964) results indicated that, given the same situation, the adult would nonetheless have a stronger modeling influence than the peer. According to Williams and Anandam (1973), these conditions are usually operative in schools. They contend that although both teachers and student peers have a strong influence on children, the former are slightly more powerful role models than the latter in most classrooms. However, rather than competing with peer group leaders, the teacher would undoubtedly do better to model desirable standards for self-reward and encourage (i.e., reinforce) influential student peers to do likewise.

Marston (1965) examined the effects of a model's self-reinforcement rate on an observer's rate of reinforcement for himself/herself and for another performer. The college-aged subjects watched a model give word associations and reward himself verbally whenever he felt he had selected "the best popular response." In the first phase of the experiment, the observer established a reinforcement rate for himself/herself as he/she performed the word association tasks. In the second phase, the observer set
a reinforcement rate for another person who performed the word association problems. The results showed that the model's self-reinforcement rate had a significant influence on both the reinforcement rate which the observer selected for himself/herself and for another performer. Apparently, an observer tends to evaluate his/her own performance and other person's performances on the basis of a model's self-reinforcement criteria. If this is the case, it would seem well-advised to provide children with models who exhibit desirable standards for self-reward.

In 1966, Bandura and Whalen (formerly Kupers) again examined the effects of modeling on self-reinforcement standards. The results of their investigation demonstrated that children exposed to an inferior model tended to adopt relatively low standards of performance for self-reinforcement. Conversely, children exposed to a more competent model tended to establish a relatively high criterion of performance for self-reinforcement. It was also found, however, that children exposed to a superior model appeared to reject his lofty standard for self-reward and set a lower criterion for themselves. These findings seemed to indicate that it is important to provide children with competent models who establish reasonably high performance standards for self-reinforcement.

Mischel and Liebert (1966) investigated the effects of discrepancies between observed and imposed reinforcement
criteria on observers' adoption of self-reward standards. One group of fourth grade children observed a model who set a high standard for self-reward and encouraged the children to do likewise. Another group watched a model who established a high criterion for self-reward but encouraged the children to use a more lenient criterion. Conversely, a third group witnessed a model who used a low self-reward standard but imposed a high self-reward standard on the children. Following exposure to the treatment conditions, the children performed the game alone, then demonstrated the game to a younger child. Children whose model used and encouraged high self-reward standards were found to adopt the most stringent self-reward criteria when performing alone. Children whose model incorporated high self-reward standards but encouraged lower standards established the least stringent self-reward criteria when performing alone. Furthermore, the subjects tended to impose the same reward criterion on the younger children that they used for themselves. These results implied that a model's self-reward criteria are most likely to be imitated when his/her recommendations are consistent with his/her actions. Also, it would appear that high performance standards have little modeling effect when the observers are permitted to set lower standards of achievement for themselves. With reference to teaching and teacher training, it would seem that modeling high standards for
self-reward is not a sufficient condition for student imitation. Apparently, it is necessary to encourage (i.e., prompt) students to establish similar standards of their own.

Liebert and Allen (1967) compared the effects of direct training and modeling on children's standards for self-reward. Under the direct training condition, the children (third and fourth graders) received a token whenever they earned a score of 20. Under the modeling condition, a model rewarded himself with a token whenever he attained a score of 20. Both direct training and modeling were shown to have the same effect on the children's selection of self-reward standards. However, children in the direct training condition stated the rule for rewards more frequently than children who had observed the model. Apparently, children can adopt a model's criterion for self-reward even though they are unable to verbalize a rule for doing so, indicating that these are separate learnings.

In a similar study by Liebert and Ora (1968), the effects of training and incentive level on children's self-reward behavior were examined. Under the direct training condition, children (eight to 10 years old) were encouraged to reward themselves with a token for a high score (20 points), but not for lower scores. Under the modeling condition, a model rewarded himself with a token each time
he made a score of 20. Children in the control condition received no information concerning standards for self-reward. The results showed that subjects in both the direct training and modeling groups adopted significantly higher standards than subjects in the control group. Furthermore, direct training and modeling were equally effective in shaping the children's self-reward criteria.

Another experimental variable was the level of incentive to obtain tokens. Half of the children were informed that their tokens could be exchanged for valuable toys (high incentive condition), whereas the other children were not told about the toys (low incentive condition). The level of incentive was found to affect the children's selection of self-reward standards. Children in the high incentive group tended to adopt lower criteria for self-reward than those in the low incentive group. Based on these findings, it would appear that incentive level may have an inverse relationship with self-reward standards. If this is the case, it may be wise for adults to model and encourage differential self-reinforcement for various levels of performance. Certainly, this would provide more opportunities for reinforcement (and thereby increase motivation to perform) than the frequently encountered all-or-none situation.

Bryan (1971) conducted an experiment to determine whether the self-reinforcement behavior of an altruistic
model has a stronger effect on observers when performed immediately following the act of generosity. The subjects (first and second grade children) observed a model donate money to charity, and make either an immediate or delayed comment to the effect that being generous makes one feel better. The results showed that the model who made an immediate comment elicited more donations from the children than the model who delayed his statement of feeling. These findings indicated that self-reinforcement for an altruistic behavior may have a stronger modeling effect when it is displayed immediately following the charitable act.

Lepper and others (1975) investigated the effects of self-reinforcement models on the self-reward behavior of children (mean age eight years). Unlike previous studies on imitation of self-reinforcement patterns, their experiments tested for generalization and persistence of the modeling effects. One group of children observed a film in which a peer model rewarded herself only for a high score on a simulated bowling game. Another group viewed a film in which a peer model rewarded herself for slightly lower scores on the bowling game, and a third group had no exposure to a model. Children in the modeling groups, while not adhering to the specific standards which they had observed, consistently established higher self-reward criteria than children in the no-model control group. The more stringent self-reward behavior was again displayed
by the modeling groups three weeks later in a similar situ-
ation involving another game. Based on these results, the
investigators concluded that, "... the children were able
to abstract an appropriate general rule from the model's
performance which affected their behavior on a different
activity with a new experiment several weeks later" (p.
628).

Based on the studies reviewed in this section, the
following recommendations concerning self-reward behavior
appear to be justified:

1. Children should be exposed to competent models
who establish reasonably high performance standards
for self reward.

2. Children should be exposed to models whose
recommendations for self-reward are consistent with
their actions.

3. Teachers should strongly encourage (i.e., prompt,
reinforce) influential student peers to model reason-
ably high standards for self-reward.

4. Adults should model and encourage differential
self-rewards for various levels of performance.

5. Statements indicating self-reward should closely
follow the modeled event.
Direct Reinforcement

It is recalled that vicarious reinforcement refers to situations in which the model's behavior is reinforced, and direct reinforcement refers to situations in which the observer's imitative behavior is reinforced. Vicarious reinforcement has been demonstrated to play a highly significant role in modeling behavior. In fact, several studies (Bandura and McDonald, 1963; Marston and Kanfer, 1963; Kanfer and Marston, 1963; Bandura, 1965b) have indicated that vicarious reinforcement is as effective as direct reinforcement for eliciting imitative behavior from observers. However, the following studies suggest that direct reinforcement to the observer facilitates modeling behavior and, in some cases, is a necessary condition for evoking matching responses.

Bandura and Harris (1966) attempted to modify the syntactic style of second grade children. Under the reinforcement-plus-set condition, children were given stars for correct sentences and told to pay close attention to the sentences which earned stars. Under the modeling condition, an adult model and a child took turns making up sentences. In the modeling-and-reinforcement condition, both the model and the child were rewarded for

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16By set condition, the authors meant that the child was prompted to discover which types of sentence constructions earned reinforcement.
appropriate sentences. In the modeling-and-reinforcement-plus-set condition, both the model and the child were rewarded for correct constructions and told to pay close attention to the sentences which earned stars. The results showed that, for passive constructions, the modeling-and-reinforcement-plus-set condition was superior to the other treatments. For prepositional phrases, the reinforcement-plus-set condition was found to be significantly more effective than the modeling treatment. The investigators therefore concluded that modeling by itself had no demonstrable influence on young children's syntactic style.

A study by Liebert, Odom, Hill, and Huff (1969) also investigated the acquisition of language constructions by children of various ages (elementary through junior high). In the first phase of their experiment, sentences containing a preposition-article-noun sequence were modeled by an adult. Whenever the subjects produced sentences with a preposition-article-noun sequence they were verbally reinforced and given a token. The second phase of the experiment was identical to the first except that sentences containing an article-noun-preposition sequence were modeled and rewarded. The results revealed that the performance of the older children was superior to that of the younger children. Furthermore, the findings indicated
that children's adoption of language constructions may be facilitated by a combination of modeling and direct reinforcement. The investigators concluded that:

"... the present study provides direct information about the acquisition of novel language rules and suggests that these can be imparted by a combination of modeling and reward variables (p. 111)."

The effects of a child's reinforcement history on imitative behavior were investigated by Hartup and Coates (1967). The subjects (56 nursery school children) were categorized in terms of their reinforcement background, and assigned to various treatment conditions. The following results were obtained:

1. Children exposed to an altruistic peer model exhibited significantly more altruistic behavior than children who did not observe a model.

2. Children with a history of frequent reinforcement from peers imitated a rewarding model significantly more than a nonrewarding model.

3. Children with a history of infrequent reinforcement from peers imitated a nonrewarding model significantly more than a rewarding model.

These findings indicated that children who have received much reinforcement tend to select reinforcing models, and

\[17\] In this study, a rewarding model was defined as one who exhibited attention, approval, affection, personal acceptance, submission, and token-sharing behavior.
that children who have received little reinforcement tend to choose nonreinforcing models. It would appear, therefore that one's past experience with direct reinforcement may have an influence on one's imitation of modeled behavior.

Baer, Peterson, and Sherman (1967) trained profoundly retarded children to imitate a large number of simple movements through the use of direct reinforcement. In their experiment, the observer was presented with a discriminative stimulus, "Do this," followed by a demonstration of the movement. If the observer reproduced the model's movement, he/she was reinforced with food, preceded by the word "Good". Initially, the experimenter often had to guide the children through the appropriate gestures. However, the sequence of 130 imitative responses was sufficient to increase the observer's probability of imitating new responses from zero, at the beginning of the program, to between 80 to 100 percent at the conclusion of the program. Although the conditions of this experiment were clearly atypical, it is highly unlikely that the subjects would have copied the model's movements without the addition of direct reinforcement. Apparently, when the probability of imitation is low, direct reinforcement can exert a positive influence on the observer to perform the modeled behavior.
The effects on imitative behavior of task complexity and the perceived competence of the model were investigated by Greenfeld and Kuznicki (1975). Under simple task conditions, the subjects were required to select the winning horse in simulated horse racing situations. Under complex task conditions, the subjects were required to choose the first three finishers of the horse race, in order of finish. The subjects were differentially reinforced for imitating the selection of a model. One group of subjects (high reinforcement condition) was correct on 75 percent of the trials in which the model's choice was imitated. Another group (mid-reinforcement condition) was correct on 25 percent of the matching selections, and a third group (low reinforcement condition) was correct on 12.5 percent of its imitative trials.

The findings revealed that simple tasks are more likely to be imitated than complex tasks, and that reinforcement increases imitative behavior for tasks of both a simple and a complex nature. According to the authors, these results suggested that although a model may provide a pattern of behavior for an observer to follow, the contingencies of reinforcement associated with the modeled behavior seem to determine whether an observer will initiate and continue imitative behavior.
This section will conclude with a discussion on the role of reinforcement in modeling behavior. McDonald (1973) contends that for modeling to occur, the model's behavior must be reinforced by its consequences. However, other research indicates that reinforcement to the model is not a necessary condition for observer imitation (Bandura, Ross, and Ross, 1963b; Bandura, 1965b; Walters and Parke, 1964). Nevertheless, it is probably true that the observer anticipates some reinforcing consequence as a result of his/her imitative behavior. In fact, according to social learning theory (Bandura, 1971), reinforcement for performing imitative behavior may be in the form of direct reinforcement, vicarious reinforcement, or self-reinforcement. Furthermore, both operant conditioning theories and social learning theories agree that the performance of imitative behavior is strongly controlled by its consequences.

Glavin (1974) suggests that the modeling process can be facilitated through direct reinforcement procedures, and Bandura (1965a) submits that the direct reinforcement process (operant conditioning) can be facilitated through modeling procedures. From an operational viewpoint, it would indeed appear that imitative behavior can best be induced by providing both a prestigious model and appropriate reinforcement for matching behavior. In fact, the
most accurate and helpful statement about teaching and learning behavior may be that, "The combined use of modeling and reinforcement procedures is probably the most efficacious method of transmitting, eliciting, and maintaining social response patterns" (Bandura, 1969, p. 161).

**Symbolization**

The role of symbolic processes in the acquisition and performance of modeled behavior has not received much attention by researchers and, consequently, is not well understood. Bandura (1969) has theorized that:

... modeling phenomena involves the utilization of symbolic representations of modeled patterns in the form of imaginal and verbal contents to guide overt performances (p. 141).

In other words, Bandura believes that an observer retains modeled behavior in symbolic form, and is thereby able to reproduce it at a later time in the absence of the model.

The effects of verbal symbolization on imitative behavior were investigated by Bandura, Grusec, and Menlove (1966). One group of children (passive observation condition) was instructed to pay close attention to a movie in which a model performed a variety of responses. Another group (active symbolization condition) was requested to verbalize every action of the model as it was being performed on the screen. A third group (competing
symbolization condition) was told to repeatedly count a sequence of numbers while they watched the filmed presentation. The results demonstrated that children in the active symbolization group performed more imitative behavior than those in the passive observation group. Furthermore, children in the passive observation group produced more matching responses than those in the competing symbolization group. These findings seemed to suggest that verbal symbolization processes may influence the acquisition and performance of modeled behavior.

Gerst (1971) also investigated the effects of symbolic coding processes on modeling behavior. College students were exposed to a filmed model who presented a number of motoric responses from the manual language of the deaf. Subjects in the summary labeling group were requested to develop a summary label that would describe each modeled movement in an easily remembered form. Students in the imaginal coding group were asked to close their eyes after each presentation and to visualize the modeled gesture in vivid and detailed imagery. Subjects in the verbal description group were told to verbally describe the exact movements of the modeled response. The control subjects were instructed to perform counting tasks while observing the filmed modeling episode. Summary labeling, imaginal coding, and verbal description
were all found to facilitate reproduction of the modeled responses. The results also showed that, on most measures of imitation, summary labeling proved superior to imaginal coding, and imaginal coding produced better results than verbal description. In view of these findings, Gerst concluded that, "... symbolic coding operations play an important role in observational learning" (p. 14).

Fraser, Bellugi, and Brown (1963) examined the effects of imitation, comprehension, and production processes on the verbal ability of very young children (three years of age). Under the imitation condition, the children imitated sentences presented by the experimenter. In the comprehension condition, the children pointed to pictures which were referred to in sentences spoken by the experimenter. In the production condition, the children named pictures which were referred to in sentences spoken by the experimenter. The findings revealed that imitation trials produced more correct answers than comprehension trials, which in turn resulted in more correct responses than production trials. The authors concluded that, whereas comprehension and production involve reference processes, imitation depends only upon perceptual motor processes, and therefore does not work through the meaning system. If this is so, it would imply that imitation of a response does not necessarily assure understanding of the response, even when symbolic coding operations are utilized. For example, a novice tennis
player may imitate his/her instructor's forehand stroke with considerable accuracy. However, this does not necessarily mean that he/she understands why he/she shifts his/her weight forward, nor that he/she will do so in a similar but non-modeled striking skill (i.e., backhand stroke, handball swing, etc.). It would therefore appear that in situations where understanding is desirable, means of assessment other than response reproduction should be incorporated.

In summary, the research on symbolization processes indicates that symbolic operations may have a significant influence on modeling behavior, and that summary labeling procedures are more effective than other coding techniques. However, whether or not symbolic processes are utilized, it would appear that the imitation of a response and the understanding of a response are not necessarily synonymous.

**Summary of Related Literature**

Modeling behavior is an intriguing field of study. According to Woodring (1975), the observation and emulation of a master teacher is the oldest form of teacher education. Yet, as noted by McKenzie (1976), modeling is not even listed as a topical heading in the *Education Index*. Modeling represents a relatively recent area of inquiry, and most of the modeling research has been performed by psychologists (predominantly behaviorists) away from educational settings.
Nonetheless, it would appear from both empirical and experimental evidence that modeling is a highly relevant area of study for teacher educators and educational researchers. The research that is available clearly indicates that the observation and emulation of a master teacher (now called student teaching) is still the most powerful means of training teachers (Zevin, 1974). Fuller and Bown's (1975) contention that teachers are not only models, but metaphors for appropriate classroom behaviors also has considerable support in the literature. Furthermore, Ryan (1974) strongly implies that the most critical responsibility for a teacher educator is to be a model of teaching excellence.

Teacher educators also have an obligation to provide their students with effective strategies for teaching students and managing classroom behavior. Although little modeling research has actually occurred in the classroom, those studies which have been completed (Smith and Lovitt, 1975; Brody and Zimmerman, 1975; Zevin, 1974; Csapo, 1972) clearly indicate the potential of planned modeling techniques for the achievement of various educational goals.

Several other researchers have found that teacher preparation programs can be enhanced through the incorporation of modeling procedures (Koran, 1969b; Young, 1969;
Clark, Macrae, Ida, and Smith, 1975). These studies have demonstrated that symbolic models and filmed models, as well as live models, can have a significant impact on the instructional behavior of pre-service teachers. Ringer (1973) has indicated that similar results can be realized with in-service teachers, especially when they are exposed to modeling techniques in their own classrooms.

Good and Brophy (1973) have pointed out that teachers are, at all times, models of behavior for their students. Bandura (1965b) has demonstrated that modeled behavior can be acquired without being overtly performed. Bryan and Walbek (1970) have indicated that behavioral example has a stronger modeling effect than verbal exhortation. Each of these findings implies that it is important for teachers (and especially for teacher educators) to be aware of their personal influence on students through modeling. Yet, awareness is only the first step. Surely, the real challenge to educators (at all levels) is to develop and utilize effective modeling procedures to help their students acquire and perform desirable patterns of learning and social behavior.

This review has presented a large percentage of the literature related to modeling behavior. Although a variety
of issues were examined in 13 somewhat discrete sections, the reviewer has attempted to focus on two major topics:

1. Basic concepts of modeling.

2. Modeling in educational settings.

Clearly, the most prominent researcher of modeling behavior is Albert Bandura, and several of his theories were discussed in this review. Based on Bandura's work and the other research studies which have been surveyed, the following list represents the reviewer's understanding of the 10 most significant modeling concepts presented in this paper.

1. Bandura (1973) has classified modeling behavior into three distinct categories:
   a. Modeling Effect.
   b. Inhibitory/Disinhibitory Effects.
   c. Response Facilitation Effect.

2. According to Bandura (1973), the modeling process depends on four interrelated sub-processes:
   a. Attentional Processes.
   b. Retention Processes.
   d. Reinforcement and Motivational Processes.

3. Bandura (1965b) has theorized that modeling involves an acquisition (learning) phase and a performance phase.
4. Bandura (1969) had hypothesized that modeling inputs are retained in symbolic form, as words and images.

5. Aaronfreed (1969) has proposed that discriminative stimuli play a highly significant role in modeling behavior.

6. According to Bandura (1969), a combination of modeling and positive reinforcement is probably the best means of eliciting desired behavior.

7. Rushall and Siedentop (1972) have suggested that the learning of skilled behavior is accelerated through the use of skillful models.

8. Bryan and Walbek (1970) have indicated that what a model does has a stronger modeling effect than what he/she says.

9. According to Kirigin and her co-workers (1975), modeling a behavior minimizes the probability of misinterpretation.

10. Bronfenbrenner (1970) has submitted that a model has greater influence when he/she is perceived to possess:
    
    a. A high degree of status.
    
    b. A high degree of competence.
    
    c. A high degree of similarity to the observer.
Recommendations for Further Study

Wolins (1962) and Dunkin and Biddle (1974) have indicated that research results and interpretations of the same can be influenced by the particular commitments of the investigators. If such is the case, certainly modeling research is also susceptible to this kind of investigator bias. Although some of the presumably more important modeling concepts have been examined by a number of researchers, many others have not. Consequently, it is suggested that additional research (perhaps even replication) would be well-advised, particularly on those issues where conclusive results have not been obtained.

Gage (1963) has expressed some legitimate concerns regarding modeling behavior:

One problem with the concept of identification is that it can seem to explain too much. How does a pupil choose among competing models the one with whom he identifies? Among the many characteristics and behaviors of his model? How does he fit what he adopts from his model into his already organized personality? What determines how deep or superficial the imitation will be (p. 138)?

Although some of Gage's questions have been the focus of modeling research, it is clear that much study is still needed on modeling discrimination. It is therefore recommended that more research be undertaken to determine how observers differentiate among models and modeled
behaviors. This research should be supplemented by studies on how to best teach others to make effective modeling discriminations.

Henry (1963) has proposed a problem which is perhaps more difficult to resolve. According to Henry:

... when cynicism, resignation, and passivity enter life, the first makes all emulative choice of properties seem vain, and passivity and resignation sap the will necessary to the emulative decision. But positively, in order for a morally sound emulative choice to be made there must be present some faith in one's self; a certain amount of naive optimism and a certain quantity of will (p. 229).

Obviously, there is more to modeling than merely presenting an attractive model. How does one convince another that modeling behavior is indeed valuable? Clearly, this is not an easy question to answer, but it seems to be related to positive reinforcement. It is suggested, therefore, that the relationship between modeling and positive reinforcement is an important topic which deserves considerably more research. Research which could develop principles for the complementary use of modeling techniques and operant conditioning procedures in the classroom would appear to be extremely valuable to the field of education.

In the final analysis, however, it is felt that the most crucial research problem related to modeling and imitation is whether or not modeling is an effective means for achieving specific educational objectives. The present
study was therefore undertaken to determine whether or not teacher modeling is an effective instructional technique in the real-life environment of the athletic field and the gymnasium.
CHAPTER III
PROCEDURES

The fundamental purpose of this study was to determine whether teacher modeling was an effective means for attaining specific educational objectives with elementary students in physical education settings. The investigation consisted of three separate modeling experiments. It was the purpose of the first experiment to discover whether:

1. Teacher modeling was an effective means for increasing the rate of student encouragement in group settings.

2. Teacher modeling plus prompting was more effective than teacher modeling alone for increasing the rate of student encouragement in group settings.

It was the purpose of the second experiment to discover whether:

1. Teacher modeling was an effective means for increasing the rate of student encouragement to low-skilled individuals in group settings.
2. Teacher modeling plus prompting was more effective than teacher modeling alone for increasing the rate of student encouragement to low-skilled individuals in group settings.

It was the purpose of the third experiment to discover whether:

1. Teacher modeling was an effective means for increasing the rate of student instruction to low-skilled individuals in tutorial settings.

2. Teacher modeling was an effective means for increasing the rate of student encouragement to low-skilled individuals in tutorial settings.

3. Teacher modeling plus prompting was more effective than teacher modeling alone for increasing the rate of student encouragement to low-skilled individuals in tutorial settings.

A sub-problem of this investigation for all three experiments was to determine whether students of one sex exhibited more teacher-matching behavior than students of the other sex. Another sub-problem was to determine whether older children imitated the teacher's behavior to a greater degree than younger children. This chapter is apportioned into the following sections:

1. Selection of subjects.

2. Instructional procedures.
A total of over 500 elementary age students and 35 teachers took part in this study. All of the teachers were instructors (coaches) of community youth athletic programs, and all provided their students with legitimate instruction in physical education or athletic skills. Although only a small percentage of the instructors had professional training in physical education and/or athletic coaching, each possessed a relatively high degree of expertise in the sport which he/she coached. Furthermore, since the expressed purpose of each athletic program was to teach useful sports skills to all participating children, the words "coach," "instructor," and "teacher" were used interchangeably throughout this study to designate the adult officially in charge of the children's learning and playing experiences.

Due to practical considerations, the students and teachers were selected from educational settings within the Columbus metropolitan area. Nonetheless, the neighborhoods and programs chosen for this research differed considerably with regard to such factors as competitive
emphasis (i.e., from highly competitive to non-competitive), type of clientele (i.e., from largely white-collar families to largely blue-collar families), and time allotments (i.e., from a minimum of two hours per week to a maximum of six hours per week). For the purpose of this investigation, the following community sponsored youth sports programs (including both practice sessions and competitions) were considered to be educational settings:

1. Upper Arlington Recreation Department Summer Sports Program.
2. Grandview Recreation Department Summer Sports Program.
3. Upper Arlington Cub Scouts Tee-ball Program.
4. Upper Arlington Cub Scouts Baseball Program.
5. North Columbus Boys Tee-ball Program.
6. North Columbus Girls Tee-ball Program.
7. Columbus Jewish Center Tee-ball Program.

A major determinant in the selection of subjects was, of course, willingness on the part of the teachers to participate in the investigation. The students who participated in the sports practice sessions and competitions under investigation automatically became subjects in this study. With the exception of the tutorial modeling situations, all of the students attending and participating in the game or practice session were included.
in the data collection, even when they were not actively engaged in the ongoing activity.

Although practical considerations prevented the students from being randomly assigned to treatment groups, the procedures which determined placement on any given athletic team or with any particular coach were clearly unpredictable and appeared to have a randomizing effect. The students who participated in the tutorial teaching episodes were essentially assigned at random to one of the three treatment conditions.

Instructional Procedures

The first experiment investigated the effects of teacher modeling on the rate of peer encouragement in general in sports group settings. Encouragement was defined as statements which were positive and supportive of student behavior. For example, verbal comments such as "Good try," or "You'll hit it next time" would each be recorded as an instance of encouraging behavior. A total of 92 separate teaching episodes were observed by the investigator and his assistants. For each teaching episode, the cumulative frequency of teacher encouraging statements directed towards any member of the sports group was recorded and subsequently converted into rate per minute. Similarly, the cumulative frequency of student encouraging comments directed towards any peer member of the
sports group was recorded and converted into rate per minute. The investigator did not attempt to alter the coaches' level of encouraging behavior, but did request some of the more encouraging coaches to prompt (ask) their students to encourage each other. The prompt was typically a statement such as, "I would like for you to encourage each other today," and was occasionally repeated during the activity period.

After all of the data were collected, each data summary was sorted into one of four predetermined categories for analysis of the main effects. These categories represented the following treatment conditions:

1. Teacher Low- Peer encouragement under low levels (0.00-0.99 comments/minute) of teacher encouragement (N=26).
2. Teacher Medium- Peer encouragement under medium levels (1.00-1.99 comments/minute) of teacher encouragement (N=28).
3. Teacher High- Peer encouragement under high levels (2.00 + comments/minute) of teacher encouragement (N=22).
4. Teacher Prompt- Peer encouragement under teacher encouragement (medium or high levels) plus prompting to be encouraging (N=16).
The second experiment examined the effects of teacher modeling on the rate of peer encouragement to low-skilled individuals in sports group settings. Encouragement was defined and recorded exactly the same as in the first experiment. For each of the 129 observations, the cumulative frequency of teacher encouraging comments directed towards specific low-skilled members of the sports group was recorded and subsequently converted into rate per minute. The cumulative frequency of student encouraging statements directed towards specific low-skilled peers was also recorded and converted into rate per minute. The investigator did not attempt to change the coaches' level of encouraging behavior, but did request some of the more encouraging coaches to prompt their students to encourage each other. A common prompt was a statement such as, "Remember that everyone needs encouragement." The prompt was occasionally repeated by the teacher during the activity period.

Upon collection of all the data, each data summary was sorted into one of four predetermined categories for analysis of the main effects. These categories represented the following treatment conditions:

1. Teacher Low- Peer encouragement to target students under low levels (0.00-0.09 comments/minute) of teacher encouragement (N=41).
2. Teacher Medium- Peer encouragement to target
students under medium levels (0.10 - 0.19 comments/minute) of teacher encouragement (N=26).

3. Teacher High- Peer encouragement to target students under high levels (0.20 + comments/minute) of teacher encouragement (N=38).

4. Teacher Prompt- Peer encouragement to target students under teacher encouragement (medium or high levels) plus prompting to be encouraging (N=24).

The third experiment evaluated the effects of teacher modeling on the rates of peer instruction and peer encouragement to a less-skilled student in sports tutorial settings. Encouragement was defined and recorded exactly the same as in the first and second experiment. Instruction was defined as statements for the purpose of teaching specific physical skills. For example, verbal comments such as "Contact the ball at the hairline," or "Snap forward at the waist" would each be recorded as an instance of instructional behavior. Data were obtained from 233 planned tutorial teaching episodes conducted by the investigator and his assistants. In each tutorial situation, a student was asked to teach a familiar athletic skill (i.e., batting, catching, heading) to a less-skilled peer. While the target student was teaching (usually two to three minutes in duration) an observer recorded the cumulative frequency of his/her encouraging
statements to the less-skilled peer, and subsequently converted these data into rate per minute.

Target students in the No-Model treatment condition had no exposure to a model prior to their tutorial teaching experience. Target students in the Model treatment condition received two to three minutes of adult instruction and encouragement in the same skill which they were to teach just prior to tutoring their less-skilled peer. A typical instructional statement was, "Use both hands to catch the ball," and a typical encouraging statement was, "Good try, you almost caught that one." Target students in the Model-Prompt treatment condition also interacted with the adult model and were further requested to give encouragement to the less-skilled peer whom they were to teach. The prompt was generally a statement such as, "John will probably do better if you give him encouragement." The target students were prompted only once, immediately before their tutorial teaching episode.

At the completion of all the tutorial teaching sessions, the data from the following treatment conditions were analyzed for main effects:

1. No-Model- Student instruction and encouragement to a less-skilled peer in the absence of a model (N=85).
2. Model- Student instruction and encouragement to a less-skilled peer following exposure to an adult who modeled specific instructional and encouraging behaviors (N=80).

3. Model-Prompt- Student instruction and encouragement to a less-skilled peer following exposure to a helpful adult model plus prompting to be encouraging (N=68).

**Collection of Data**

All observations of the community youth athletic programs were conducted by the investigator and two assistants. Event recording was the technique employed to determine the number of discrete target behaviors (i.e., instructional statements or encouraging statements) exhibited by the teachers or the students in each of the three modeling experiments. Standardized coding forms were developed to facilitate the observational recording procedures. Each coding sheet for the tutorial modeling experiment was specific to the activity being taught, and contained sample instructional and encouraging statements (see Appendix A). Coding sheets for all three modeling experiments provided the following information:

1. Activity.

2. Setting.

3. Date.
4. Observation time.
5. Target student(s).
6. Teacher.
7. Number of students.
8. Age of students.
9. Student(s)' sex.
10. Teacher's sex.

The observers attempted to be as unobtrusive as possible with regard to the normal activities of the practice session or competition. An observer typically placed himself/herself at the periphery of the activity area in such a location as to hear any comments made by the teacher and the students. Although most of the observations took place on playing fields, there were relatively few problems with regard to the intensity or clarity of the comments issued by either the teachers or the students. The tutorial teaching episodes were conducted far enough away from the ongoing activity that the children's instructional and encouraging statements were easily audible. As with any field-based study, the data collected in group settings were less than 100 percent accurate. However, the only major problem encountered by the observers was the recording of encouraging statements following an important event (i.e., homerun, soccer goal). The agreed upon procedure among the observers for coding
encouraging comments under these conditions was to record three checkmarks every two seconds during which the cheering continued.

The only equipment necessary for the observers was a clipboard, coding sheet, writing implement, and a watch. It was essential for the data collectors to accurately record the starting time and ending time of each observational session, because the cumulative frequencies of instructional and encouraging statements were converted into rate per minute in order to facilitate the data analyses. For example, if a teacher made six encouraging comments to a target student during a 30-minute class period, he/she was responding at a rate of 0.20 encouraging comments per minute.

The percentage of agreement on the data recorded by two or more independent observers was calculated according to the following formula:

\[
\frac{\text{Agreements}}{\text{Agreements} + \text{Disagreements}} \times 100 = \text{Percentage of Agreement}
\]

The degree to which the data recorded by two independent observers monitoring the same instructional episode were in agreement was periodically assessed by means of planned reliability checks. These assessments of
interobserver agreement were obtained for data recorded in each of the three modeling experiments, as follows:

1. Experiment 1 - Teacher/student encouraging statements directed towards any member of the sports group.

2. Experiment 2 - Teacher/student encouraging statements directed towards specific low-skilled members of the sports group.

3. Experiment 3 - Student instructional statements and student encouraging statements issued to a less-skilled peer during tutorial teaching episodes.

Prior to collecting the experimental data, each observer received explicit instructions concerning the coding procedures. During the course of the investigation, the periodic interobserver assessments had to reveal at least 80 percent agreement for all of the behavioral categories in order for the data to be submitted for analyses.

Role of the Investigator

The investigator performed several separate functions during the course of this study. One role of the investigator for each experimental treatment was that of observer and data collector. Along with his two assistants, he was responsible for observing and recording the target behaviors (i.e., instructional or encouraging
statements) displayed by the teachers and students who participated in this investigation.

The investigator also served as the adult model in approximately two-thirds of the tutorial modeling episodes. In this capacity, the investigator gave the target student two to three minutes of instruction and encouragement in a specific athletic skill, and then asked the target student to teach the same skill to a less-skilled peer. For those tutorial treatments that required modeling plus prompting, the investigator, after serving as the helpful adult model, asked (i.e., prompted) the target student to be encouraging while teaching his/her less-skilled peer.

Another role frequently assumed by the investigator was that of an assistant coach. In each athletic program from which experimental data were obtained, the investigator was awarded official coaching status by both the instructors and the students. Consequently, he often served as a primary or secondary model for encouraging statements in the group modeling treatments. The investigator was also largely responsible for issuing prompts (i.e., asking the students to be encouraging to one another) in the group modeling experiments.

Finally, the investigator designated the target individuals for those experiments in which peer encouragement to poorly-skilled players was assessed. For the
most part, selection of the low-skilled students presented no difficulties, and in those cases where the investigator was not familiar with the participants (i.e., his initial session with a particular sports group) he relied on the judgment of the instructor.

Although the investigator had not originally planned to serve as a model for instructional and encouraging behavior, his participation clearly facilitated the collection of a large number of data summaries. Furthermore, the major modeling role assumed by the investigator in the tutorial treatments assured a high degree of consistency with regard to the modeled teaching behavior observed by the target students. Finally, although the investigator did not attempt to bias the results of this study in any manner, it is possible that the presence of the investigator may have served as a reinforcing agent for some of the children. However, since all of the treatments in this study incorporated model-present conditions, the investigator's participation should not have differentially influenced the findings.

Treatment of Data

The data collected in each of the three experiments were treated separately. The rates of student encouraging statements directed towards any member of the sports
group (Group-Any treatment) were subjected to a simple one-way analysis of variance. Comparisons of the main effects were made among the following treatment conditions:

1. Teacher Low- Peer encouragement under low levels (0.00-0.99 comments/minute) of teacher encouragement (N=26).

2. Teacher Medium- Peer encouragement under medium levels (1.00-1.99 comments/minute) of teacher encouragement (N=28).

3. Teacher High- Peer encouragement under high levels (2.00 + comments/minute) of teacher encouragement (N=22).

4. Teacher Prompt- Peer encouragement under teacher encouragement (medium or high levels) plus prompting to be encouraging (N=16).

These results were further analyzed for age effects (elementary primary vs. elementary intermediate) and for sex effects (male vs. female) by means of independent t-tests.

The rates of student encouraging comments directed towards specific low-skilled individuals in the sports group (Group-Individual treatment) were likewise submitted to a simple one-way analysis of variance. Comparisons of the main effects were made among the following treatment conditions:
1. Teacher Low- Peer encouragement to target students under low levels (0.00-0.09 comments/minute) of teacher encouragement (N=41).

2. Teacher Medium- Peer encouragement to target students under medium levels (0.10-0.19 comments/minute) of teacher encouragement (N=26).

3. Teacher High- Peer encouragement to target students under high levels (0.20+ comments/minute) of teacher encouragement (N=38).

4. Teacher Prompt- Peer encouragement to target students under teacher encouragement (medium or high levels) plus prompting to be encouraging (N=24).

In addition, these results were analyzed for the effects of age (elementary primary vs. elementary intermediate) and for the effects of sex (male vs. female) by means of independent t-tests.

The rates of student instructional statements directed towards a less-skilled peer during tutorial teaching episodes (Tutorial Instruction treatment) were also subjected to a simple one-way analysis of variance. Comparisons of the main effects were made among the following treatment conditions:

1. No-Model- Student instruction to a less-skilled peer in the absence of a model (N=85).
2. Model- Student instruction to a less-skilled peer following exposure to an adult who modeled specific instructional behaviors (N=80).

3. Model-Prompt- Student instruction to a less-skilled peer following exposure to the adult model plus prompting to be encouraging (N=68).

In a similar manner, the rates of student encouraging statements directed towards a less-skilled peer during tutorial teaching episodes (Tutorial Encouragement treatment) were submitted to a simple one-way analysis of variance. Comparisons of the main effects were made among the following treatment conditions:

1. No-Model- Student encouragement to a less-skilled peer in the absence of a model (N=85).

2. Model- Student encouragement to a less-skilled peer following exposure to an adult who modeled specific encouraging behaviors (N=80).

3. Model-Prompt- Student encouragement to a less-skilled peer following exposure to the adult model plus prompting to be encouraging (N=68).

Each of the six treatment conditions in this experiment was subsequently analyzed for age effects (elementary primary vs. elementary intermediate) and for sex effects (male vs. female) by means of independent t-tests.
The level of probability at which the results of this investigation would be considered statistically significant was set at 0.05 for all aspects of the data analyses. In accordance with the stated hypotheses, one-tailed independent t-tests were utilized to analyze the age effects, and two-tailed independent t-tests were incorporated for the analyses of the sex effects in all three experiments.
CHAPTER IV
ANALYSIS OF DATA

This chapter contains the results of the analysis of the data collected during this investigation. The chapter has been divided into the following sections:

1. Reliability of observations and data recording.
2. Analysis of teacher modeling effects on peer encouragement in general in sports group settings.
3. Analysis of age and sex effects on peer encouragement in general in sports group settings.
4. Analysis of teacher modeling effects on peer encouragement to low-skilled students in sports group settings.
5. Analysis of age and sex effects on peer encouragement to low-skilled students in sports group settings.
6. Analysis of teacher modeling effects on peer instruction and peer encouragement to less-skilled students in sports tutorial settings.
7. Analysis of age and sex effects on peer instruction and peer encouragement to less-skilled students in sports tutorial settings.

8. A discussion of the findings.

**Reliability of Observations and Data Recording**

The degree to which the data recorded by two independent observers monitoring the same instructional episode were in agreement was periodically assessed by means of planned reliability checks. These assessments of interobserver agreement were obtained for data recorded in each of the three modeling experiments. The percentage of agreement on the data recorded by two or more independent observers was calculated according to the following formula:

\[
\frac{\text{Agreements}}{\text{Agreements} + \text{Disagreements}} \times 100 = \text{Percentage of Agreement}
\]

Reliability checks were implemented during five instructional episodes in which data on peer encouragement in general in sports group settings were being recorded. The percentages of agreement on the cumulative frequency of teacher encouraging statements and student
encouraging statements directed towards any of the sports group members were as follows:

1. 83 percent.
2. 89 percent.
3. 95 percent.
4. 93 percent.
5. 97 percent.

One reliability check was taken during an instructional episode in which data on peer encouragement to low-skilled students in sports group settings were being recorded. The percentage of agreement on the number of teacher encouraging statements and student encouraging statements directed towards specific low-skilled members of the sports group was calculated to be 97 percent.

Reliability checks were also conducted over two sessions in which the number of peer instructional statements and peer encouraging statements to a less-skilled student during tutorial teaching episodes were being recorded. The mean percentage of agreement for the 12 tutorial teaching episodes conducted during the first reliability session was 92 percent. The 10 tutorial teaching episodes which comprised the second reliability session revealed a mean of 94 percent agreement on the data recorded by the two observers.

Overall, the mean percentage of agreement for the eight reliability assessments was 93 percent, with the
lowest correlation being 0.83. These results indicated that there was a relatively high degree of agreement among the three observers with regard to the number of instructional and encouraging statements issued by the subjects of this investigation, and further suggested that the data were not obtained in a capricious manner.

**Analysis of Teacher Modeling Effects on Peer Encouragement in General in Sports Group Settings**

Ninety-two of the observations in group settings focused on encouraging statements issued by the teacher(s) and the students to any member of the sports group (Group-Any treatment). The total numbers of teacher encouraging comments and student encouraging comments to the group members were recorded in the appropriate categories and subsequently converted into rate per minute. Data were analyzed for each of the following treatment conditions:

1. **Teacher Low-** Peer encouragement under low levels (0.00-0.99 comments/minute) of teacher encouragement (N=26).
2. **Teacher Medium-** Peer encouragement under medium levels (1.00-1.99 comments/minute) of teacher encouragement (N=28).
3. **Teacher High-** Peer encouragement under high levels (2.00+ comments/minute) of teacher encouragement (N=22).
4. Teacher Prompt- Peer encouragement under teacher encouragement (medium or high levels) plus prompting to be encouraging (N=16).

The mean rates of peer encouraging statements for each treatment condition are presented in Table 1, page 163, and represented graphically in Figure 1, page 164.

A simple one-way analysis of variance was utilized to evaluate the effects of teacher modeling on the rate of peer encouragement in general in sports group settings. The result of the analysis of variance revealed an F-ratio of 40.15, which was significant at the 0.05 level of probability (see Table 2, page 165). Since the presence of a significant F-ratio indicated that at least one pair of sample means was different, Student-Newman-Keuls test was incorporated to determine which groups were statistically different from each other (see Table 3, page 166). Significant differences occurred between the following group means:

1. Teacher High and Teacher Low.
2. Teacher Prompt and Teacher Low.
3. Teacher Prompt and Teacher Medium.
4. Teacher Prompt and Teacher High.

These results suggested that student groups exposed to high levels of teacher encouragement produced significantly more peer encouragement than student groups exposed to low levels of teacher encouragement, and
<table>
<thead>
<tr>
<th>Group</th>
<th>Teacher Encouragement Range</th>
<th>Teacher Encouragement $\bar{X}$</th>
<th>Student Encouragement $\bar{X}$</th>
<th>$s$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher Low (N=26)</td>
<td>0.00-0.99</td>
<td>0.56</td>
<td>0.137</td>
<td>0.170</td>
</tr>
<tr>
<td>Teacher Medium (N=28)</td>
<td>1.00-1.99</td>
<td>1.28</td>
<td>0.309</td>
<td>0.305</td>
</tr>
<tr>
<td>Teacher High (N=22)</td>
<td>2.00 +</td>
<td>2.43</td>
<td>0.512</td>
<td>0.532</td>
</tr>
<tr>
<td>Teacher Prompt (N=16)</td>
<td>1.00 +</td>
<td>1.77</td>
<td>1.850</td>
<td>1.002</td>
</tr>
</tbody>
</table>
FIGURE 1

MEAN SCORES FOR STUDENT ENCOURAGING STATEMENTS IN THE GROUP-ANY TREATMENTS
### TABLE 2

**SUMMARY OF ANALYSIS OF VARIANCE AMONG MEAN SCORES FOR THE GROUP-ANY TREATMENTS**

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F-Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>3</td>
<td>33.13</td>
<td>11.043</td>
<td>40.15*</td>
</tr>
<tr>
<td>Error</td>
<td>88</td>
<td>24.23</td>
<td>0.275</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>91</td>
<td>57.36</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant at the 0.05 level.*
<table>
<thead>
<tr>
<th>Group</th>
<th>Means</th>
<th>Teacher Medium</th>
<th>Teacher High</th>
<th>Teacher Prompt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher Low</td>
<td>0.137</td>
<td>0.172</td>
<td>0.375*</td>
<td>1.713*</td>
</tr>
<tr>
<td>Teacher Medium</td>
<td>0.309</td>
<td>0.203</td>
<td>1.541*</td>
<td></td>
</tr>
<tr>
<td>Teacher High</td>
<td>0.512</td>
<td></td>
<td></td>
<td>1.338*</td>
</tr>
<tr>
<td>Teacher Prompt</td>
<td>1.850</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant at the 0.05 level.
indicated that teacher modeling may be an effective means for increasing peer encouragement in general in sports group settings. The findings also demonstrated that teacher modeling plus prompting was superior to modeling alone, and indicated that teacher modeling plus prompting may be a highly effective means for increasing peer encouragement in general in sports group settings.

**Analysis of Age and Sex Effects on Peer Encouragement in General in Sports Group Settings**

The data on peer encouragement in general in sports group settings were further analyzed for the effects of age and sex. Age effects were determined by dividing each treatment group into two sections, elementary primary (EP, grades one through three) and elementary intermediate (EI, grades four through six). The mean rates and standard deviations of encouraging statements from each age division appear in Table 4, page 168. The differences between the means of the two age groups in each treatment condition were analyzed by independent t-tests. Since it was hypothesized that older children would exhibit more imitative behavior than younger children, one-tailed t-tests were employed for the analysis of the age effects. Significant differences were found between the mean scores of the following groups:

1. Teacher Medium EI and Teacher Medium EP ($t=2.06$).
2. Teacher High EI and Teacher High EP ($t=2.16$).
<table>
<thead>
<tr>
<th>Group</th>
<th>Teacher Encouragement Range</th>
<th>Teacher Encouragement $\bar{X}$</th>
<th>Teacher Encouragement $s$</th>
<th>Student Encouragement $\bar{X}$</th>
<th>Student Encouragement $s$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher Low EP (N=12)</td>
<td>0.00-0.99</td>
<td>0.56</td>
<td>0.103</td>
<td>0.163</td>
<td></td>
</tr>
<tr>
<td>Teacher Low EI (N=12)</td>
<td>0.00-0.99</td>
<td>0.56</td>
<td>0.184</td>
<td>0.184</td>
<td></td>
</tr>
<tr>
<td>Teacher Medium EP (N=15)</td>
<td>1.00-1.99</td>
<td>1.28</td>
<td>0.217</td>
<td>0.233</td>
<td></td>
</tr>
<tr>
<td>Teacher Medium EI (N=12)</td>
<td>1.00-1.99</td>
<td>1.28</td>
<td>0.448</td>
<td>0.344</td>
<td></td>
</tr>
<tr>
<td>Teacher High EP (N=13)</td>
<td>2.00 +</td>
<td>2.43</td>
<td>0.325</td>
<td>0.458</td>
<td></td>
</tr>
<tr>
<td>Teacher High EI (N=9)</td>
<td>2.00 +</td>
<td>2.43</td>
<td>0.782</td>
<td>0.537</td>
<td></td>
</tr>
<tr>
<td>Teacher Prompt EP (N=11)</td>
<td>1.00 +</td>
<td>1.77</td>
<td>1.787</td>
<td>1.041</td>
<td></td>
</tr>
<tr>
<td>Teacher Prompt EI (N=5)</td>
<td>1.00 +</td>
<td>1.77</td>
<td>1.992</td>
<td>1.009</td>
<td></td>
</tr>
</tbody>
</table>
In both cases, the differences between the means were in the predicted direction. It would therefore appear that, under medium and high levels of teacher encouragement, the modeling effect was significantly greater for children in the upper elementary grades than for those in the lower elementary grades.

The rates of peer encouragement behavior under the different treatment conditions were also analyzed for sex effects. The mean rates of encouraging comments issued by male subjects (M) and female subjects (F), along with the standard deviations, are shown in Table 5, page 170. Each treatment condition was tested for differences between the mean scores obtained from boys and those obtained from girls through independent t-tests. In accordance with the hypothesis that there would be no significant differences in the amount of imitative behavior exhibited by either sex, two-tailed t-tests were deemed most appropriate for these analyses. Although there were no female subjects in the Teacher High treatment group, t-tests of the other three treatment conditions revealed no statistical differences attributable to sex. In view of these results, it would seem that both boys and girls responded in a similar manner to teacher modeling in terms of encouraging their sports group teammates.
<table>
<thead>
<tr>
<th>Group</th>
<th>Teacher Encouragement</th>
<th>Teacher Encouragement</th>
<th>Student Encouragement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Range</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Teacher Low F</td>
<td>0.00-0.99</td>
<td>0.56</td>
<td>0.20</td>
</tr>
<tr>
<td>(N=2)</td>
<td></td>
<td></td>
<td>0.283</td>
</tr>
<tr>
<td>Teacher Low M</td>
<td>0.00-0.99</td>
<td>0.56</td>
<td>0.13</td>
</tr>
<tr>
<td>(N=24)</td>
<td></td>
<td></td>
<td>0.163</td>
</tr>
<tr>
<td>Teacher Medium F</td>
<td>1.00-1.99</td>
<td>1.28</td>
<td>0.43</td>
</tr>
<tr>
<td>(N=5)</td>
<td></td>
<td></td>
<td>0.409</td>
</tr>
<tr>
<td>Teacher Medium M</td>
<td>1.00-1.99</td>
<td>1.28</td>
<td>0.28</td>
</tr>
<tr>
<td>(N=23)</td>
<td></td>
<td></td>
<td>0.282</td>
</tr>
<tr>
<td>Teacher High F</td>
<td>2.00 +</td>
<td>2.43</td>
<td>----</td>
</tr>
<tr>
<td>(N=0)</td>
<td></td>
<td></td>
<td>----</td>
</tr>
<tr>
<td>Teacher High M</td>
<td>2.00 +</td>
<td>2.43</td>
<td>0.51</td>
</tr>
<tr>
<td>(N=22)</td>
<td></td>
<td></td>
<td>0.532</td>
</tr>
<tr>
<td>Teacher Prompt F</td>
<td>1.00 +</td>
<td>1.77</td>
<td>1.40</td>
</tr>
<tr>
<td>(N=3)</td>
<td></td>
<td></td>
<td>0.176</td>
</tr>
<tr>
<td>Teacher Prompt M</td>
<td>1.00 +</td>
<td>1.77</td>
<td>1.96</td>
</tr>
<tr>
<td>(N=13)</td>
<td></td>
<td></td>
<td>1.089</td>
</tr>
</tbody>
</table>
A total of 129 observations in group settings focused on encouraging comments issued by the teacher(s) and the students to specific low-skilled members of the sports group (Group-Individual treatment). The cumulative frequencies of teacher encouraging comments and student encouraging comments to the target individuals were recorded in the appropriate categories and subsequently converted into rate per minute. Data were analyzed for each of the following treatment conditions:

1. Teacher Low- Peer encouragement to target students under low levels (0.00-0.09 comments/minute) of teacher encouragement (N=41).
2. Teacher Medium- Peer encouragement to target students under medium levels (0.10-0.19 comments/minute) of teacher encouragement (N=26).
3. Teacher High- Peer encouragement to target students under high levels (0.20 + comments/minute) of teacher encouragement (N=38).
4. Teacher Prompt- Peer encouragement to target students under teacher encouragement (medium or high levels) plus prompting to be encouraging (N=24).

The mean rates of peer encouraging statements directed towards specific low-skilled individuals for each treatment
condition are presented in Table 6, page 173, and represented graphically in Figure 2, page 174.

The effects of teacher modeling on the rate of peer encouragement to low-skilled students in sports group settings were determined by a simple one-way analysis of variance. The resultant F-ratio of 34.5 was significant at the 0.05 level of probability (see Table 7, page 175). This F-ratio suggested that at least one pair of sample means was different. Therefore, Student-Newman-Keuls test was employed to ascertain which groups differed statistically from each other (see Table 8, page 176). This analysis revealed significant differences between the following group means:

1. Teacher Prompt and Teacher Low.
2. Teacher Prompt and Teacher Medium.
3. Teacher Prompt and Teacher High.

These results revealed no significant differences among the student groups exposed to different levels of teacher encouragement to the poorly-skilled players. Consequently, teacher modeling alone did not appear to be an effective means for increasing peer encouragement to low-skilled students in sports group settings. Teacher modeling plus prompting, however, was found to elicit significantly more peer encouragement to poorly-skilled students than modeling by itself. The findings therefore indicated that
TABLE 6
MEANS AND STANDARD DEVIATIONS FOR STUDENT ENCOURAGING STATEMENTS IN GROUP-INDIVIDUAL TREATMENTS (Rate/Minute)

<table>
<thead>
<tr>
<th>Group</th>
<th>Teacher Encouragement Range</th>
<th>Teacher Encouragement X</th>
<th>Teacher Encouragement s</th>
<th>Student Encouragement X</th>
<th>Student Encouragement s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher Low</td>
<td>0.00-0.09</td>
<td>0.04</td>
<td>0.032</td>
<td>0.049</td>
<td></td>
</tr>
<tr>
<td>(N=41)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher Medium</td>
<td>0.10-0.19</td>
<td>0.14</td>
<td>0.053</td>
<td>0.075</td>
<td></td>
</tr>
<tr>
<td>(N=26)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher High</td>
<td>0.20 +</td>
<td>0.48</td>
<td>0.036</td>
<td>0.059</td>
<td></td>
</tr>
<tr>
<td>(N=38)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher Prompt</td>
<td>0.10 +</td>
<td>0.22</td>
<td>0.216</td>
<td>0.137</td>
<td></td>
</tr>
<tr>
<td>(N=24)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MEAN SCORES FOR STUDENT ENCOURAGING STATEMENTS IN THE GROUP-INDIVIDUAL TREATMENTS
### TABLE 7

**SUMMARY OF ANALYSIS OF VARIANCE AMONG MEAN SCORES FOR THE GROUP-INDIVIDUAL TREATMENTS**

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F-Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>3</td>
<td>0.622</td>
<td>0.207</td>
<td>34.5*</td>
</tr>
<tr>
<td>Error</td>
<td>125</td>
<td>0.798</td>
<td>0.006</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>128</td>
<td>1.420</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant at the 0.05 level.*
TABLE 8

RESULTS OF STUDENT-NEWMAN-KEULS TEST OF DIFFERENCES BETWEEN THE MEANS FOR THE GROUP INDIVIDUAL TREATMENTS (Rate/Minute)

<table>
<thead>
<tr>
<th>Group</th>
<th>Means</th>
<th>Teacher High</th>
<th>Teacher Medium</th>
<th>Teacher Prompt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher Low</td>
<td>0.032</td>
<td>0.004</td>
<td>0.021</td>
<td>0.184*</td>
</tr>
<tr>
<td>Teacher High</td>
<td>0.036</td>
<td>0.017</td>
<td></td>
<td>0.180*</td>
</tr>
<tr>
<td>Teacher Medium</td>
<td>0.053</td>
<td></td>
<td></td>
<td>0.163*</td>
</tr>
<tr>
<td>Teacher Prompt</td>
<td>0.216</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant at the 0.05 level.
teacher modeling plus prompting may be an effective means for increasing peer encouragement to low-skilled individuals in sports group settings.

Analysis of Age and Sex Effects on Peer Encouragement to Low-Skilled Students in Sports Group Settings

The effects of age and sex on peer encouragement to low-skilled individuals in sports group settings were also analyzed. Age effects were determined by dividing each treatment group into two sections, elementary primary (EP, grades one through three) and elementary intermediate (EI, grades four through six). Table 9, page 178, lists the mean rates and standard deviations of encouraging comments from each age division. The differences between the means of the two age groups in each treatment condition were analyzed by independent t-tests. One-tailed t-tests were incorporated for the analysis of age effects because it was hypothesized that older children would produce more imitative behavior than younger children. The results of the analyses revealed no significant differences in the predicted direction between the mean scores of the two age groups. This finding therefore suggested that, with regard to encouraging comments to poorly-skilled peers in group settings, children in the upper elementary grades were not more responsive to teacher modeling than children in the lower elementary grades.
<table>
<thead>
<tr>
<th>Group</th>
<th>Teacher Encouragement Range</th>
<th>Teacher Encouragement X</th>
<th>Student Encouragement X</th>
<th>s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher Low EP</td>
<td>0.00-0.09</td>
<td>0.04</td>
<td>0.037</td>
<td>0.050</td>
</tr>
<tr>
<td>(N=23)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher Low EI</td>
<td>0.00-0.09</td>
<td>0.04</td>
<td>0.024</td>
<td>0.048</td>
</tr>
<tr>
<td>(N=18)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher Medium EP</td>
<td>0.10-0.19</td>
<td>0.14</td>
<td>0.053</td>
<td>0.085</td>
</tr>
<tr>
<td>(N=13)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher Medium EI</td>
<td>0.10-0.19</td>
<td>0.14</td>
<td>0.052</td>
<td>0.068</td>
</tr>
<tr>
<td>(N=13)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher High EP</td>
<td>0.20 +</td>
<td>0.48</td>
<td>0.031</td>
<td>0.064</td>
</tr>
<tr>
<td>(N=22)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher High EI</td>
<td>0.20 +</td>
<td>0.48</td>
<td>0.049</td>
<td>0.053</td>
</tr>
<tr>
<td>(N=14)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher Prompt EP</td>
<td>0.10 +</td>
<td>0.22</td>
<td>0.272</td>
<td>0.132</td>
</tr>
<tr>
<td>(N=13)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher Prompt EI</td>
<td>0.10 +</td>
<td>0.22</td>
<td>0.150</td>
<td>0.116</td>
</tr>
<tr>
<td>(N=11)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The data on peer encouragement behavior under the various treatment conditions were also analyzed for sex effects. The mean rates and standard deviations of encouraging statements issued by male subjects (M) and female subjects (F) are displayed in Table 10, page 180. The mean scores for boys and the mean scores for girls were subjected to independent t-tests. As it was hypothesized that no significant differences would be found between girls' and boys' imitative behavior, two-tailed t-tests were employed for these analyses. The results of the t-tests showed no statistical differences between the rates of male encouraging comments and female encouraging comments in any of the treatment groups. These findings indicated that both boys and girls responded in a similar manner to teacher modeling in terms of encouraging their poorly-skilled sports group teammates.

Analysis of Teacher Modeling Effects on Peer Instruction and Peer Encouragement to Less-Skilled Students in Sports Tutorial Settings

Data were obtained from 233 planned tutorial teaching episodes. In each tutorial situation, a student was asked to teach a familiar athletic skill (i.e., batting, catching, heading) to a less-skilled peer. While the target student was teaching (usually two to three minutes in duration) an observer recorded the cumulative
<table>
<thead>
<tr>
<th>Group</th>
<th>Teacher Encouragement Range</th>
<th>Teacher Encouragement $\bar{X}$</th>
<th>Student Encouragement $\bar{X}$</th>
<th>$s$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher Low F (N=5)</td>
<td>0.00-0.09</td>
<td>0.04</td>
<td>0.038</td>
<td>0.065</td>
</tr>
<tr>
<td>Teacher Low M (N=36)</td>
<td>0.00-0.09</td>
<td>0.04</td>
<td>0.031</td>
<td>0.048</td>
</tr>
<tr>
<td>Teacher Medium F (N=4)</td>
<td>0.10-0.19</td>
<td>0.14</td>
<td>0.050</td>
<td>0.060</td>
</tr>
<tr>
<td>Teacher Medium M (N=22)</td>
<td>0.10-0.19</td>
<td>0.14</td>
<td>0.053</td>
<td>0.079</td>
</tr>
<tr>
<td>Teacher High F (N=2)</td>
<td>0.20 +</td>
<td>0.48</td>
<td>0.040</td>
<td>0.057</td>
</tr>
<tr>
<td>Teacher High M (N=36)</td>
<td>0.20 +</td>
<td>0.48</td>
<td>0.036</td>
<td>0.060</td>
</tr>
<tr>
<td>Teacher Prompt F (N=3)</td>
<td>0.10 +</td>
<td>0.22</td>
<td>0.203</td>
<td>0.133</td>
</tr>
<tr>
<td>Teacher Prompt M (N=21)</td>
<td>0.10 +</td>
<td>0.22</td>
<td>0.218</td>
<td>0.141</td>
</tr>
</tbody>
</table>
frequency of his/her instructional and encouraging statements to the less-skilled peer, and subsequently converted these data into rate per minute.

In 85 of the teaching tutorials, the target students had no exposure to a model prior to their tutorial teaching experience (No-Model). Consequently, their instructional and encouraging statements were recorded as No-Model Instruction (NMI) and No-Model Encouragement (NME), respectively.

Target students in 80 of the tutorial episodes received two to three minutes of adult instruction and encouragement in the same skill which they were to teach just prior to tutoring a less-skilled peer (Model). The instructional and encouraging statements issued by these target students were recorded as Modeled Instruction (MI) and Modeled Encouragement (ME), respectively.

In 68 tutorial sessions, the target students interacted with the adult model and were further requested to give encouragement to the less-skilled peer whom they were to teach (Model-Prompt). Under this condition, the target student's instructional and encouraging statements were recorded as Modeled Instruction plus Prompting (MIP) and Modeled Encouragement plus Prompting (MEP), respectively. It should be noted that the target students were prompted with regard to their encouraging behavior,
but were not prompted with regard to their instructional behavior. The mean frequencies of instructional and encouraging statements issued by the target students (in rate per minute) for each of the treatment conditions are presented in Table 11, page 183, and represented graphically in Figures 3 and 4, pages 184 and 185, respectively.

Simple one-way analysis of variance was the statistical technique employed to determine the effects of teacher modeling on the rate of student instructional statements and student encouraging statements to a less-skilled peer during tutorial teaching episodes. The first analysis of variance evaluated the effects of the three treatment conditions on the rate of target student instructional statements. An F-ratio of 21.23, significant at the 0.05 level of probability, indicated that there was a difference in at least one pair of sample means (see Table 12, page 186). Student-Newman-Keuls test was incorporated to discover which groups differed statistically from each other (see Table 13, page 187). The results of this analysis revealed significant differences between the following group means:

1. Modeled Instruction and No-Model Instruction.
2. Modeled Instruction plus Prompting and No-Model Instruction.
<table>
<thead>
<tr>
<th>Group</th>
<th>Instructional Statements</th>
<th>Encouraging Statements</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\bar{X}$</td>
<td>$s$</td>
</tr>
<tr>
<td>No-Model (N=85)</td>
<td>1.09</td>
<td>1.112</td>
</tr>
<tr>
<td>Model (N=80)</td>
<td>2.41</td>
<td>1.362</td>
</tr>
<tr>
<td>Model-Prompt (N=68)</td>
<td>2.03</td>
<td>1.574</td>
</tr>
</tbody>
</table>
Figure 3

Mean scores for student instructional statements in tutorial treatments.
FIGURE 4

MEAN SCORES FOR STUDENT ENCOURAGING STATEMENTS IN TUTORIAL TREATMENTS
<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F-Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>2</td>
<td>76.85</td>
<td>38.43</td>
<td>21.23*</td>
</tr>
<tr>
<td>Error</td>
<td>230</td>
<td>416.50</td>
<td>1.81</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>232</td>
<td>493.35</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant at the 0.05 level.
<table>
<thead>
<tr>
<th>Group</th>
<th>Means</th>
<th>MIP</th>
<th>MI</th>
</tr>
</thead>
<tbody>
<tr>
<td>NMI</td>
<td>1.09</td>
<td>0.94*</td>
<td>1.32*</td>
</tr>
<tr>
<td>MIP</td>
<td>2.03</td>
<td></td>
<td>0.38</td>
</tr>
<tr>
<td>MI</td>
<td>2.41</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant at the 0.05 level.
These results suggested that students exposed to the adult model issued significantly more instructional statements than students who did not observe a model, and indicated that teacher modeling may be an effective means for increasing peer instruction to less-skilled students in sports tutorial settings. The findings also implied that students in the Model-Prompt treatment gave significantly more instruction to their less-skilled peer than students in the No-Model treatment. However, since the students in the Model-Prompt treatment were prompted only with regard to encouraging behavior, it is assumed that their higher rate of instructional behavior was due to the effects of teacher modeling alone.

The second analysis of variance evaluated the effects of the three treatment conditions on the rate of target student encouraging statements. This analysis produced an F-ratio of 100.11, which was significant at the 0.05 level of probability (see Table 14, page 189). Student-Newman-Keuls test was administered to determine which pair(s) of sample means were statistically different from each other (see Table 15, page 190). The results of this analysis disclosed significant differences between the following group means:

1. Modeled Encouragement and No-Model Encouragement.
<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F-Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>2</td>
<td>214.04</td>
<td>107.02</td>
<td>100.11*</td>
</tr>
<tr>
<td>Error</td>
<td>230</td>
<td>245.96</td>
<td>1.07</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>232</td>
<td>460.00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant at the 0.05 level.
### TABLE 15

RESULTS OF STUDENT-NEWMAN-KEULS TEST OF DIFFERENCES BETWEEN THE MEANS FOR THE TUTORIAL ENCOURAGEMENT TREATMENTS (Rate/Minute)

<table>
<thead>
<tr>
<th>Group</th>
<th>Means</th>
<th>ME</th>
<th>MEP</th>
</tr>
</thead>
<tbody>
<tr>
<td>NME</td>
<td>0.27</td>
<td>0.55*</td>
<td>2.32*</td>
</tr>
<tr>
<td>ME</td>
<td>0.82</td>
<td></td>
<td>1.77*</td>
</tr>
<tr>
<td>MEP</td>
<td>2.59</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant at the 0.05 level.
2. Modeled Encouragement plus Prompting and No-Model Encouragement.
3. Modeled Encouragement plus Prompting and Modeled Encouragement.

These results suggested that students exposed to the adult model issued significantly more encouraging statements than students who did not observe a model, and indicated that teacher modeling may be an effective means for increasing peer encouragement to less-skilled students in sports tutorial settings. The findings also demonstrated that teacher modeling plus prompting was superior to modeling alone, and indicated that teacher modeling plus prompting may be a highly effective means for increasing peer encouragement to less-skilled students in sports tutorial settings.

Analysis of Age and Sex Effects on Peer Instruction and Peer Encouragement to Less-Skilled Students in Sports Tutorial Settings

The effects of age and sex on student rates of instruction and encouragement to a less-skilled peer during tutorial teaching sessions were also analyzed for each of the treatment conditions. Age effects were ascertained by dividing the data from each treatment condition into two sections, elementary primary (EP, grades one through three) and elementary intermediate (EI, grades four
through six). The mean rates and standard deviations of instructional and encouraging statements from each age division are presented in Table 16, page 193. Independent t-tests were used to analyze the differences between the two age groups. Since it was hypothesized that older children would exhibit more matching behavior than younger children, one-tailed t-tests were employed for this analysis. Significant differences occurred between the mean scores of the following groups:

1. No-Model Instruction EI and No-Model Instruction EP (t=4.49).
3. Modeled Encouragement EI and Modeled Encouragement EP (t=2.05).
4. Modeled Instruction plus Prompting EI and Modeled Instruction plus Prompting EP (t=2.43).

All differences between the means were in the predicted direction. These results indicated that in the absence of a model, children in the upper elementary grades gave significantly more instruction and encouragement than children in the lower elementary grades when placed in a teaching tutorial with a less-skilled peer. The findings further suggested that, following exposure to the adult model, the older children in the Modeled Encouragement
<table>
<thead>
<tr>
<th>Group</th>
<th>Instructional Statements</th>
<th>Encouraging Statements</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\bar{X}$</td>
<td>$s$</td>
</tr>
<tr>
<td>No-Model EP (N=62)</td>
<td>0.79</td>
<td>0.836</td>
</tr>
<tr>
<td>No-Model EI (N=23)</td>
<td>1.89</td>
<td>1.362</td>
</tr>
<tr>
<td>Model EP (N=58)</td>
<td>2.44</td>
<td>1.296</td>
</tr>
<tr>
<td>Model EI (N=22)</td>
<td>2.33</td>
<td>1.551</td>
</tr>
<tr>
<td>Model-Prompt EP (N=43)</td>
<td>1.69</td>
<td>1.390</td>
</tr>
<tr>
<td>Model-Prompt EI (N=25)</td>
<td>2.62</td>
<td>1.721</td>
</tr>
</tbody>
</table>
treatment produced significantly more encouraging comments than the younger children. Also, the older students in the Modeled Instruction plus Prompting treatment issued a significantly higher rate of instructional statements than their younger counterparts. Since students in the Modeled Instruction plus Prompting treatment were prompted only to be encouraging, it is assumed that the effects of teacher modeling were stronger for the older children in this group than for the younger children.

The effects of the students' sex on the rates of instructional and encouraging comments offered to a less-skilled peer during tutorial teaching episodes were analyzed in a similar manner. Table 17, page 195, lists the mean rates and standard deviations of instructional and encouraging statements issued by male subjects (M) and female subjects (F) in each treatment condition. The mean scores from the girls and boys in each treatment condition were submitted to independent t-tests. As it was originally hypothesized that there would be no significant differences between males and females in terms of imitative behavior, two-tailed t-tests were used for these analyses. The t-tests revealed no statistical differences between the rates of male instructional statements and female instructional statements, nor between the rates of male encouraging statements and female encouraging statements in any of the treatment groups.
<table>
<thead>
<tr>
<th>Group</th>
<th>Instructional Statements</th>
<th>Encouraging Statements</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\bar{X}$</td>
<td>$s$</td>
</tr>
<tr>
<td>No-Model F (N=10)</td>
<td>1.15</td>
<td>0.728</td>
</tr>
<tr>
<td>No-Model M (N=75)</td>
<td>1.08</td>
<td>1.157</td>
</tr>
<tr>
<td>Model F (N=7)</td>
<td>1.83</td>
<td>1.210</td>
</tr>
<tr>
<td>Model M (N=73)</td>
<td>2.47</td>
<td>1.370</td>
</tr>
<tr>
<td>Model-Prompt F (N=10)</td>
<td>1.15</td>
<td>1.029</td>
</tr>
<tr>
<td>Model-Prompt M (N=58)</td>
<td>2.18</td>
<td>1.609</td>
</tr>
</tbody>
</table>
These results indicated that the effects of teacher modeling were similar for both boys and girls with regard to instructing and encouraging a less-skilled peer during tutorial teaching episodes.

**Discussion of Findings**

The lengthy survey of literature related to modeling and imitation indicates that a considerable number of investigators have examined the complexities of this subject. However, as noted in the introduction, only about five percent of the modeling research has occurred in educational settings. It was therefore the fundamental purpose of this study to determine whether or not teacher modeling was an effective instructional technique in the real-life environment of the athletic field and the gymnasium. The effects of teacher modeling were systematically evaluated, alone and with prompting, for instructional statements and for encouraging statements, in sports group settings and in sports tutorial settings, for older children and for younger children, for boys and for girls.

The results of this investigation, based on 454 separate data summaries, indicated that teacher modeling (alone and with prompting) may be an effective instructional technique when utilized with elementary age children participating in organized youth sports programs. More specifically, the findings suggested that teacher
modeling was an effective means for increasing peer encouragement in general in sports group settings. To the degree that peer encouragement may be considered a form of altruistic behavior, this outcome was consistent with findings by Rosenhan and White (1967), Bryan and Test (1967), Hartup and Coates (1967), Test and Bryan (1969), and Cox (1974), that persons exposed to an altruistic model tend to display more helping behavior than persons who do not observe an altruistic model.

Peer encouragement to low-skilled members of the sports group, however, did not seem to be positively affected by teacher modeling alone. This result may have been due to the phenomenon noted by Harris and Samerotte (1975) that altruistic behavior (i.e., helping the poorly-skilled) has a weaker modeling effect than other behaviors (i.e., acting aggressively). Another possible explanation for this finding may be related to Solomon and Grota's (1976) conclusion that when the cost of helping is high observers tend to avoid involvement, preferring to give full responsibility to the model. Accordingly, students may have withheld encouragement from their poorly-skilled peers for fear of social disapproval for attending to non-athletic, low-status participants. It is also conceivable that the students simply did not discriminate the modeled behavior, although the relatively high rate
of teacher encouraging statements directed towards low-skilled individuals in the Teacher High treatment (mean = 0.48 encouraging comments per minute) would seem to render this explanation less likely. In any case, teacher modeling by itself was not a strong enough intervention to increase peer encouragement to poorly-skilled students in sports group settings.

The results of this study also suggested that teacher modeling was more effective in tutorial settings than in group settings. This was indicated by the finding that teacher modeling did not increase peer encouragement to less-skilled students in group situations, but it significantly increased peer encouragement to less-skilled students in tutorial situations. This outcome may have resulted from an increased awareness of the modeled behavior and/or an increased sense of responsibility for assisting a less-skilled peer when placed in a tutorial teaching situation. In addition, the finding that students were more helpful tutors (i.e., gave more instruction and encouragement to their less-skilled peer) after interacting with a helpful adult model seemed to support Gelfand and others' (1974) observation that children tend to teach other children by the same methods which they were taught.
Perhaps the most significant finding of this investigation was the superiority of teacher modeling plus prompting over teacher modeling alone for eliciting peer encouragement behavior from elementary age students. Teacher modeling plus prompting appeared to be a highly effective strategy for increasing peer encouragement in general in sports group settings, for increasing peer encouragement to low-skilled students in sports group settings, and for increasing peer encouragement to low-skilled students in sports tutorial settings. This finding was in agreement with that of Csapo (1972), in which modeling plus prompting proved effective for changing the classroom behavior of elementary school children. It was also supportive of Mischel and Liebert's (1966) finding that children were more likely to imitate a model's behavior when they were prompted to do so. It would appear that student imitative behavior is enhanced when the teacher's behavior is clear and consistent with his/her recommendations. In fact, there is considerable evidence (Mischel and Liebert, 1966; Bryan and Walbek, 1970; Wolf and Cheyne, 1972; Zevin, 1974) that a model's recommendations have little influence on the behavior of others unless his/her actions support his/her words.

The findings regarding teacher modeling plus prompting would seem to have important implications for teacher preparation programs. They clearly indicate that teachers
can effectively change student behavior by performing (modeling) the desired behavior themselves and asking (prompting) their students to do likewise. Furthermore, teacher modeling plus prompting would seem to promote high standards of teacher honesty, in that teachers who incorporate this instructional technique must exhibit actions which are consistent with their recommendations. Since, according to Siedentop (1976), teachers' words frequently represent more ideal conduct than their actions, teacher modeling plus prompting may be instrumental for improving teacher behavior as well as student behavior.

The analysis of the age effects showed that in the absence of a model, older children issued significantly more instructional and encouraging statements to a less-skilled peer during a teaching tutorial than younger children. The findings also revealed that in four of the nine treatment conditions in which students were exposed to teacher modeling alone (including the Modeled Instruction plus Prompting treatment), elementary intermediate students produced significantly greater amounts of imitative behavior than elementary primary students. This result seemed to be in agreement with the findings obtained by Wapner and Cirillo (1968) and Liebert and others (1969), that older children are more likely to discriminate and imitate a model's behavior than younger
children. However, there were no significant age-related differences in the other five treatment conditions in which students were exposed to teacher modeling alone. It is therefore postulated that factors other than age may have been responsible for modeling effects heretofore attributed to age alone. One such factor, as indicated by Fouts and Liikanen (1975), may involve the developmental level of the child. In any case, the investigator was unable to draw any firm conclusions from the analysis of the age effects based on the data from this investigation. Quite obviously, further research is needed on this aspect of modeling behavior. Finally, older students were not found to be more encouraging than younger students in any of the three modeling plus prompting treatment conditions (excluding the Modeled Instruction plus Prompting treatment).

The findings related to sex effects were based on a sample which contained less than 12 percent female subjects (F=51, M=403). This situation was largely due to the fact that relatively few girls participated in the summer sports programs included in this investigation. Comparisons within each treatment condition showed no significant differences between the mean scores for boys and the mean scores for girls. The results indicated that boys and girls were similar in their response to teacher modeling in all three experiments. The finding
that modeling elicited similar amounts of imitative behavior from both boys and girls was in agreement with the large majority of modeling studies reviewed in Chapter II, in which, after finding no significant differences attributable to sex, the investigators combined the children's scores for analyses of the main effects.

In summary, the major findings of this investigation were that:

1. Teacher modeling plus prompting appeared to be a highly effective means for increasing the peer encouragement behavior of elementary age children in all three experiments.

2. Teacher modeling plus prompting appeared to be superior to teacher modeling alone for increasing the peer encouragement behavior of elementary age children in all three experiments.

3. Teacher modeling alone appeared to be an effective means for increasing the peer encouragement behavior of elementary age children in two of the three experiments.

4. Teacher modeling alone seemed to produce more peer encouragement behavior in tutorial settings than in group settings.

5. Teacher modeling (alone and with prompting) seemed to elicit similar amounts of peer encouragement behavior from boys and from girls.
The most important outcome of this investigation appeared to be that teacher modeling plus prompting was a highly effective means for increasing the peer encouragement behavior of elementary age children participating in youth sports programs. It is therefore postulated that physical education teachers and coaches could probably have a greater influence on the behavior of their students by learning to effectively utilize modeling plus prompting as an instructional technique. While learning to prompt student behaviors may present few difficulties, learning to effectively model the desired behaviors may require considerably more practice. It is therefore recommended that prospective physical educators be given training and experience in the use of modeling strategies for attaining specific educational objectives. Learning to use an instructional technique that is effective for replacing peer criticism behavior with peer encouragement behavior would seem to be a meaningful objective for undergraduate physical education students.
CHAPTER V

SUMMARY AND CONCLUSIONS

The fundamental purpose of this study was to determine whether teacher modeling was an effective means for attaining specific educational objectives with elementary students in physical education settings. The investigation consisted of three separate modeling experiments. It was the purpose of the first experiment to discover whether:

1. Teacher modeling was an effective means for increasing the rate of student encouragement in group settings.

2. Teacher modeling plus prompting was more effective than teacher modeling alone for increasing the rate of student encouragement in group settings.

It was the purpose of the second experiment to discover whether:

1. Teacher modeling was an effective means for increasing the rate of student encouragement to low-skilled individuals in group settings.
2. Teacher modeling plus prompting was more effective than teacher modeling alone for increasing the rate of student encouragement to low-skilled individuals in group settings.

It was the purpose of the third experiment to discover whether:

1. Teacher modeling was an effective means for increasing the rate of student instruction to low-skilled individuals in tutorial settings.
2. Teacher modeling was an effective means for increasing the rate of student encouragement to low-skilled individuals in tutorial settings.
3. Teacher modeling plus prompting was more effective than teacher modeling alone for increasing the rate of student encouragement to low-skilled individuals in tutorial settings.

A sub-problem of this investigation for all three experiments was to determine whether students of one sex exhibited more teacher-matching behavior than students of the other sex. Another sub-problem was to determine whether older children imitated the teacher's behavior to a greater degree than younger children.

Summary

All of the subjects in this investigation (N=454) were participants in community youth athletic programs.
within the Columbus metropolitan area. These programs (including both practice sessions and competitions) were observed by the investigator and two assistants. Event recording was employed to determine the cumulative frequency of discrete target behaviors (i.e., encouraging statements or instructional statements) displayed by the teachers and the students. The investigation consisted of three separate modeling experiments.

The first experiment examined the effects of teacher modeling on the rate of student encouraging comments directed towards any member of the sports group. The four treatment conditions were as follows:

1. Teacher Low- Peer encouragement under low levels (0.00-0.99 comments/minute) of teacher encouragement (N=26).
2. Teacher Medium- Peer encouragement under medium levels (1.00-1.99 comments/minute) of teacher encouragement (N=28).
3. Teacher High- Peer encouragement under high levels (2.00 + comments/minute) of teacher encouragement (N=22).
4. Teacher Prompt- Peer encouragement under teacher encouragement (medium or high levels) plus prompting to be encouraging (N=16).
The second experiment evaluated the effects of teacher modeling on the rate of student encouraging comments directed towards specific low-skilled members of the sports group. The four treatment conditions were as follows:

1. Teacher Low- Peer encouragement to target students under low levels (0.00-0.09 comments/minute) of teacher encouragement (N=41).
2. Teacher Medium- Peer encouragement to target students under medium levels (0.10-0.19 comments/minute) of teacher encouragement (N=26).
3. Teacher High- Peer encouragement to target students under high levels (0.20 + comments/minute) of teacher encouragement (N=38).
4. Teacher Prompt- Peer encouragement to target students under teacher encouragement (medium or high levels) plus prompting to be encouraging (N=24).

The third experiment investigated the effects of teacher modeling on the rates of student instructional statements and student encouraging statements directed towards a less-skilled peer during tutorial teaching episodes. The three treatment conditions were as follows:

1. No-Model- Student instruction and encouragement to a less-skilled peer in the absence of a model (N=85).
2. Model- Student instruction and encouragement to a less-skilled peer following exposure to a helpful adult model (N=80).

3. Model-Prompt- Student instruction and encouragement to a less-skilled peer following exposure to a helpful adult model plus prompting to be encouraging (N=68).

Data from each of the three experiments were submitted to simple one-way analysis of variance to determine any significant differences among the group means. In addition, data from each treatment group were analyzed for the effects of age and sex by means of independent t-tests.

Findings

The results of the analyses of data from this investigation indicated the following:

1. Teacher modeling plus prompting appeared to be a highly effective means for increasing the peer encouragement behavior of elementary age children in all three experiments.

2. Teacher modeling plus prompting appeared to be superior to teacher modeling alone for increasing the peer encouragement behavior of elementary age children in all three experiments.
3. Teacher modeling alone appeared to be an effective means for increasing the peer encouragement behavior of elementary age children in two of the three experiments.

4. Teacher modeling alone seemed to produce more peer encouragement behavior in tutorial settings than in group settings.

5. Teacher modeling (alone and with prompting) seemed to elicit similar amounts of peer encouragement behavior from boys and from girls.

Conclusions

Within the limits of this investigation it was concluded that:

1. Teacher modeling alone may be an effective means for increasing peer encouragement in general in sports group settings, and for increasing peer instruction and encouragement to less-skilled students in sports tutorial settings.

2. Teacher modeling plus prompting may be a highly effective means for increasing peer encouragement in general in sports group settings, for increasing peer encouragement to low-skilled students in sports group settings, and for increasing peer encouragement to less-skilled students in sports tutorial settings.
Recommendations for Further Study

A possible limitation of this study was the absence of a treatment group that experienced teacher prompting without teacher modeling. A Prompting Alone group was not included in the present investigation because it was considered hypocritical for an educator to request students to be encouraging while displaying no encouragement behavior himself/herself. However, for the purposes of research (and realizing that Prompting Alone is a far too common teaching tactic), an experiment designed to compare Modeling Alone, Prompting Alone, and Modeling plus Prompting might provide useful information concerning the modeling effect. For ethical purposes, such an experiment might incorporate a teacher absent design in which the teacher leaves the playing area immediately after modeling and/or prompting the target behavior.

The inconsistent results obtained in this study with regard to the relationship between age and imitative behavior clearly indicated a need for further research on this aspect of modeling. It is suggested that future investigations in this area examine factors other than age alone, such as the developmental level of the children involved. It is quite possible that the lack of age effects in several of the treatment groups from this
study was due to overlapping among the third and fourth grade students in terms of their developmental level.

It would also seem of interest to investigate the effects of teacher modeling (alone and with prompting) on specific behaviors exhibited by secondary students. Further comparisons could be made among high school students, junior high students, and elementary students, to determine whether the modeling effects obtained in this study are generalizable to other educational levels. A similar experimental design involving the same or different target behaviors across all three educational levels would certainly appear to be of some practical value.

Although systematic data were not obtained on the effects of competitive emphasis (i.e., highly competitive or non-competitive), type of clientele (i.e., largely white-collar families or largely blue-collar families), or time allotments (i.e., two hours per week or six hours per week), it appeared that each of these factors influenced, to a greater or lesser degree, the extent to which the students imitated the behaviors modeled by their teachers. It is therefore submitted that careful examination of each of these variables might provide a better understanding of modeling behavior (and peer encouragement behavior) in physical education settings.
Finally, it is strongly recommended that modeling investigations be systematically conducted in the academic environment of school classrooms, as well as in the athletic environment of playing fields and gymnasiums. These experiments should examine the effects of teacher modeling across a variety of behaviors and situations, and should endeavor to build upon previous research in order to enhance the generalizability of the findings.
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APPENDIX A
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### Instructional Statements

- Forward/backward stance in line with ball.
- Arms partly extended and elbows partly flexed.
- Flexion at wrists and elbows upon ball contact.
- Eyes focused on ball until it contacts hands.
- Use both hands to catch the ball.
- Balls above the belt, thumbs together.
- Balls below the belt, thumbs apart.
- Fly balls, arms extended overhead.
- Ground balls, glove on the ground.
- Other.

### Encouraging Statements

- Good catch.
- Good try.
- Other.
**Results**

Total number of instructional statements. 
Rate/minute. 

Total number of encouraging statements. 
Rate/minute.
CODING SHEET

Activity Throwing                      Target Student__________
Setting__________________________    Model      Yes____ No____
Date____________________________    Number of Students________
Starting Time___________    Age of Students___________
Ending Time___________    Student's Sex___________
Observation Time______    Model's Sex_____________

Instructional Statements

Left side towards target.  _____
Step forward with left foot.  _____
Turn hips, trunk and shoulders forward.  _____
Swing right elbow horizontally forward.  _____
Fully extend elbow and wrist upon release.  _____
Move left arm in opposition to right arm.  _____
Use cross-seams throwing grip.  _____
Throw to the receiver's chest.  _____
Low throws are better than high throws.  _____
Other.  _____

Encouraging Statements

Good throw.  _____
Good try.  _____
Other.  _____
Results

Total number of instructional statements. ___
Rate/minute ___

Total number of encouraging statements. ___
Rate/minute ___
CODING SHEET

Activity  Hitting  Target Student
Setting  Model  Yes _ No __
Date  Number of Students
Starting Time  Age of Students
Ending Time  Student's Sex
Observation Time  Model's Sex

Instructional Statements

Left side towards the target.  
Step forward with left foot.  
Turn hips, trunk and shoulders forward.  
Swing elbows in a horizontal plane.  
Fully extend elbows and wrists upon contact.  
Hold hands high and away from body.  
Wrists should be initially cocked.  
Focus on the pitcher and follow the ball through your full range of vision.  
The speed of the swing is very important.  
Other.  

Encouraging Statements

Good hit.  
Good try.  
Other.
Results

Total number of instructional statements.
Rate/minute.

Total number of encouraging statements.
Rate/minute.
## CODING SHEET

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### Instructional Statements

- Eye on ball.
- Good balance.
- Hairline contact.
- Snap from waist.
- Move into the ball.
- Head through the ball.
- Face direction of pass.
- Other.

### Encouraging Statements

- Good head.
- Good try.
- Other.
Results

Total number of instructional statements.
Rate/minute.

Total number of encouraging statements.
Rate/minute.
CODING SHEET

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Instructional Statements

- Keep both feet in contact with the ground.
- Use both hands to throw the ball.
- Apply equal pressure with both hands.
- Start throw from position behind head.
- Use a whiplike throwing motion.
- Snap wrists upon releasing the ball.
- Aim the throw at a teammate's head or feet.
- Other.

Encouraging Statements

- Good throw-in.
- Good try.
- Other.
Results

Total number of instructional statements. ______
Rate/minute. ______
Total number of encouraging statements. ______
Rate/minute. ______
APPENDIX B

RAW DATA
## TABLE 18

PEER ENCOURAGEMENT IN GROUP-ANY TREATMENTS
(Rate/Minute)

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**PEER ENCOURAGEMENT IN GROUP-ANY TREATMENTS BY AGE**  
(Rate/Minute)

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**PEER ENCOURAGEMENT IN GROUP-INDIVIDUAL TREATMENTS**  
(Rate/Minute)

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TABLE 18 (Continued)

PEER ENCOURAGEMENT IN GROUP-INDIVIDUAL TREATMENTS BY AGE
(Rate/Minute)

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TABLE 18 (Continued)

PEER INSTRUCTION AND ENCOURAGEMENT IN TUTORIAL TREATMENTS BY AGE
(Rate/Minute)

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