INFORMATION TO USERS

This reproduction was made from a copy of a document sent to us for microfilming. While the most advanced technology has been used to photograph and reproduce this document, the quality of the reproduction is heavily dependent upon the quality of the material submitted.

The following explanation of techniques is provided to help clarify markings or notations which may appear on this reproduction.

1. The sign or “target” for pages apparently lacking from the document photographed is “Missing Page(s)”. If it was possible to obtain the missing page(s) or section, they are spliced into the film along with adjacent pages. This may have necessitated cutting through an image and duplicating adjacent pages to assure complete continuity.

2. When an image on the film is obliterated with a round black mark, it is an indication of either blurred copy because of movement during exposure, duplicate copy, or copyrighted materials that should not have been filmed. For blurred pages, a good image of the page can be found in the adjacent frame. If copyrighted materials were deleted, a target note will appear listing the pages in the adjacent frame.

3. When a map, drawing or chart, etc., is part of the material being photographed, a definite method of “sectioning” the material has been followed. It is customary to begin filming at the upper left hand corner of a large sheet and to continue from left to right in equal sections with small overlaps. If necessary, sectioning is continued again—beginning below the first row and continuing on until complete.

4. For illustrations that cannot be satisfactorily reproduced by xerographic means, photographic prints can be purchased at additional cost and inserted into your xerographic copy. These prints are available upon request from the Dissertations Customer Services Department.

5. Some pages in any document may have indistinct print. In all cases the best available copy has been filmed.
Douge, Brian Maxwell

THE EFFECT OF A COOPERATING TEACHER'S MODELING OF SPECIFIC TEACHING BEHAVIORS ON THE TEACHING BEHAVIOR OF A PHYSICAL EDUCATION INTERN

The Ohio State University

Ph.D. 1984

University Microfilms International

Copyright 1984 by

Douge, Brian Maxwell

All Rights Reserved
PLEASE NOTE:

In all cases this material has been filmed in the best possible way from the available copy. Problems encountered with this document have been identified here with a check mark ✓.

1. Glossy photographs or pages
2. Colored illustrations, paper or print
3. Photographs with dark background
4. Illustrations are poor copy
5. Pages with black marks, not original copy
6. Print shows through as there is text on both sides of page
7. Indistinct, broken or small print on several pages ✓
8. Print exceeds margin requirements
9. Tightly bound copy with print lost in spine
10. Computer printout pages with indistinct print
11. Page(s) _________ lacking when material received, and not available from school or author.
12. Page(s) _________ seem to be missing in numbering only as text follows.
13. Two pages numbered _________ . Text follows.
14. Curling and wrinkled pages
15. Other

University Microfilms International
THE EFFECT OF A COOPERATING TEACHER'S MODELING OF SPECIFIC TEACHING BEHAVIORS ON THE TEACHING BEHAVIOR OF A PHYSICAL EDUCATION INTERN

DISSERTATION

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

By

Brian Douge, Dip. Teach., G.D.T., B.P.E., M.P.E.

* * * * *

The Ohio State University

1984

Reading Committee: Approved by:

Dr. Daryl Sledentop

Dr. Andrew Taggart

Dr. Jackie Herkowitz

Department of Physical Education, School of Health, Physical Education and Recreation
To Jennifer who has devoted her life to the happiness, comfort and success of her husband and family. Jennifer you could give me no greater gift than your eternal presence in my life.
ACKNOWLEDGMENTS

My appreciation is extended to the six student teachers and six elementary physical education teachers who participated as subjects in the study.

I am most grateful to Reg O'Cansey, Tim Kitts, and Kathy Graham for their assistance with the collection of data in the field.

A very warm and appreciative thank you goes to Cindy Crawford who devoted many hours to observing and recording. I hope she realizes how much she contributed to the success of this study.

Dr. Jackie Herkowitz continually stimulated my interest in young children and was a constant source of encouragement throughout the doctoral program. I thank her for the enormous contribution to my development.

Special thanks and eternal gratitude are extended to Dr. Daryl Sledentop and Dr. Andrew Taggart. Their outstanding ability to conceptualize and present knowledge has been a constant inspiration to me. They continually display a dedication to professionalism and are excellent models for anyone working in physical education. I cannot thank them enough.

To Joanne Taggart, Bobbie Sledentop, and the many others who at times during my life, provided the encouragement and assistance needed to make this possible.

Where would anyone be without their mum and dad. Mum and Dad to
ACKNOWLEDGMENTS (CONTINUED)

you I extend the greatest feelings of gratitude, love and concern. Although your childrearing task is never complete and I will always be your "little boy", please know that throughout my life there is nothing I have enjoyed more than being your "little boy". Thank you for your unyielding support of my academic goals.

Finally, to my wife Jennifer and son Robert I extend the deepest gratitude for their many hours of patience, tolerance and understanding. Jenny, thank you for your assistance with the mundane tasks of proof reading, observing and recording. Without you, none of this would have been possible.
VITA

March 2, 1951 ........................................ Born: Launceston, Tasmania, Australia

1972 ..................................................... Diploma of Teaching, Elementary, State College of Victoria, Burwood, Victoria, Australia.

1973-1974 ............................................. Elementary Classroom Teacher, Victorian Education Department, Australia.

1974-1976 ............................................. Elementary Physical Education Specialist Victorian Education Department, Australia.

1976 ..................................................... Graduate Diploma of Teaching, State College of Victoria, Burwood, Victoria, Australia.


1978 ..................................................... Bachelor of Physical Education University of West Australia, Perth, Western Australia.


1983 ..................................................... M.P.E., Physiology, University of W. A., Perth, Australia.

1983-1984 ............................................. Teaching Assistant, Physical Education Department, The Ohio State University, Columbus, Ohio.

PUBLICATIONS

"Forty Sequential Lessons In Australian Rules Football", B. Douge,
VITA (CONTINUED)


"Organizing Your Training Session", Videotape presentation, Department of Youth Sport and Recreation, Wembley, W.A., Australia.


FIELDS OF STUDY

Major Field: Physical Education

Studies on Teacher Education: Professor Daryl Siedentop
TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dedication</td>
<td>11</td>
</tr>
<tr>
<td>Acknowledgements</td>
<td>111</td>
</tr>
<tr>
<td>Vita</td>
<td>v</td>
</tr>
<tr>
<td>List of Tables</td>
<td>x</td>
</tr>
<tr>
<td>List of Figures</td>
<td>xl</td>
</tr>
<tr>
<td>Chapter I. Introduction</td>
<td>1</td>
</tr>
<tr>
<td>Purpose and Significance of the Study</td>
<td>5</td>
</tr>
<tr>
<td>Research Questions</td>
<td>6</td>
</tr>
<tr>
<td>Definitions</td>
<td>7</td>
</tr>
<tr>
<td>Limitations</td>
<td>7</td>
</tr>
<tr>
<td>Summary</td>
<td>8</td>
</tr>
<tr>
<td>Chapter II. Review of Related Literature</td>
<td>9</td>
</tr>
<tr>
<td>Modeling</td>
<td>14</td>
</tr>
<tr>
<td>Attending</td>
<td>14</td>
</tr>
<tr>
<td>Discriminating observations</td>
<td>14</td>
</tr>
<tr>
<td>Characteristics of models</td>
<td>16</td>
</tr>
<tr>
<td>Characteristics of behaviors</td>
<td>19</td>
</tr>
<tr>
<td>Use of rewards and punishments</td>
<td>22</td>
</tr>
<tr>
<td>Directions for observing</td>
<td>24</td>
</tr>
<tr>
<td>Teacher Training</td>
<td>24</td>
</tr>
<tr>
<td>The Design of Modeling Research</td>
<td>34</td>
</tr>
<tr>
<td>Teacher Effectiveness</td>
<td>45</td>
</tr>
<tr>
<td>Ingredients of effective teaching</td>
<td>46</td>
</tr>
<tr>
<td>Methods of effective teaching</td>
<td>47</td>
</tr>
<tr>
<td>Strategies of effective teaching</td>
<td>50</td>
</tr>
<tr>
<td>Climates of effective teaching</td>
<td>41</td>
</tr>
<tr>
<td>Management of effective teaching</td>
<td>41</td>
</tr>
<tr>
<td>Teacher effectiveness in physical education</td>
<td>53</td>
</tr>
<tr>
<td>Summary</td>
<td>60</td>
</tr>
<tr>
<td>Chapter III. Methods and Procedures</td>
<td>63</td>
</tr>
<tr>
<td>Subjects and Setting</td>
<td>63</td>
</tr>
<tr>
<td>Observation Instrument</td>
<td>74</td>
</tr>
</tbody>
</table>
TABLE OF CONTENTS (CONTINUED)

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definitions of Teaching Behaviors</td>
<td>78</td>
</tr>
<tr>
<td>Description and Training of Observers</td>
<td>89</td>
</tr>
<tr>
<td>Reliability</td>
<td>92</td>
</tr>
<tr>
<td>Intervention and Design of the Study</td>
<td>95</td>
</tr>
<tr>
<td>Training of Cooperating Model Teachers</td>
<td>104</td>
</tr>
<tr>
<td>Methods of Data Analysis</td>
<td>105</td>
</tr>
<tr>
<td>Summary</td>
<td>109</td>
</tr>
<tr>
<td>Chapter IV. Analysis and Discussion of the Data</td>
<td>111</td>
</tr>
<tr>
<td>Reliability</td>
<td>111</td>
</tr>
<tr>
<td>Reliability Discussion</td>
<td>119</td>
</tr>
<tr>
<td>Summary of the Data</td>
<td>119</td>
</tr>
<tr>
<td>Research question 1</td>
<td>120</td>
</tr>
<tr>
<td>Research question 2</td>
<td>136</td>
</tr>
<tr>
<td>Research question 3</td>
<td>146</td>
</tr>
<tr>
<td>Research question 4</td>
<td>150</td>
</tr>
<tr>
<td>Results and discussion of common target behaviors</td>
<td>151</td>
</tr>
<tr>
<td>Results and discussion of behaviors unique to either the experimental or control Interns</td>
<td>156</td>
</tr>
<tr>
<td>Summary</td>
<td>159</td>
</tr>
<tr>
<td>Chapter V. Summation of the Study</td>
<td>160</td>
</tr>
<tr>
<td>A Review of the Study</td>
<td>160</td>
</tr>
<tr>
<td>Conclusions</td>
<td>163</td>
</tr>
<tr>
<td>Question 1</td>
<td>163</td>
</tr>
<tr>
<td>Question 2</td>
<td>164</td>
</tr>
<tr>
<td>Question 3</td>
<td>165</td>
</tr>
<tr>
<td>Question 4</td>
<td>166</td>
</tr>
<tr>
<td>Recommendations</td>
<td>170</td>
</tr>
<tr>
<td>A Final Note</td>
<td>173</td>
</tr>
<tr>
<td>Bibliography</td>
<td>175</td>
</tr>
<tr>
<td>Appendix A</td>
<td>190</td>
</tr>
<tr>
<td>Appendix B</td>
<td>196</td>
</tr>
<tr>
<td>Appendix C</td>
<td>201</td>
</tr>
<tr>
<td>Appendix</td>
<td>Page</td>
</tr>
<tr>
<td>-----------</td>
<td>------</td>
</tr>
<tr>
<td>Appendix D</td>
<td>203</td>
</tr>
<tr>
<td>Part D-1</td>
<td>204</td>
</tr>
<tr>
<td>Part D-2</td>
<td>209</td>
</tr>
<tr>
<td>Appendix E</td>
<td>211</td>
</tr>
<tr>
<td>Appendix F</td>
<td>222</td>
</tr>
<tr>
<td>Appendix G</td>
<td>227</td>
</tr>
</tbody>
</table>
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Tables</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The Design of Studies Conducted to Investigate the Effect of Modeling on Learning and Behavior.</td>
</tr>
<tr>
<td>2</td>
<td>Student Time Data from Four Major Research Programs</td>
</tr>
<tr>
<td>3</td>
<td>Characteristics of Cooperating Teachers</td>
</tr>
<tr>
<td>4</td>
<td>Characteristics of Interns</td>
</tr>
<tr>
<td>5</td>
<td>Reliability Measures for the Observations of Teaching Behaviors</td>
</tr>
<tr>
<td>6</td>
<td>Mean Reliabilities of Teaching Behaviors of Each Phase of the Study</td>
</tr>
<tr>
<td>7</td>
<td>Record of Cooperating Teachers Application of Written Suggestions and Feedback</td>
</tr>
<tr>
<td>8</td>
<td>Mean Numbers or Percentage of Teaching Behaviors in Each Phase of the Study for the Experimental Group</td>
</tr>
<tr>
<td>9</td>
<td>Mean Numbers or Percentage of Teaching Behaviors in Each Phase of the Study for the Control Group</td>
</tr>
<tr>
<td>10</td>
<td>Mean Numbers and Percents of Behaviors for the Control and Experimental Interns</td>
</tr>
</tbody>
</table>
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figures</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Critical Teacher Behavior Observation System</td>
<td>77</td>
</tr>
<tr>
<td>2 Intervention &quot;A&quot; Strategy -- Standard Intern Training</td>
<td>98</td>
</tr>
<tr>
<td>3 Subject Roles</td>
<td>100</td>
</tr>
<tr>
<td>4 Design Prototype</td>
<td>101</td>
</tr>
<tr>
<td>5 Multiple Baseline Analysis Across Behaviors: Experimental Group -- Intern 1 and Cooperating Model Teacher 1</td>
<td>121</td>
</tr>
<tr>
<td>6 Multiple Baseline Analysis Across Behaviors: Experimental Group -- Intern 2 and Cooperating Model Teacher 2</td>
<td>122</td>
</tr>
<tr>
<td>7 Multiple Baseline Analysis Across Behaviors: Experimental Group -- Intern 3 and Cooperating Model Teacher 3</td>
<td>123</td>
</tr>
<tr>
<td>8 Multiple Baseline Analysis Across Behaviors: Control Group -- Intern 4 and Model Teacher 4</td>
<td>124</td>
</tr>
<tr>
<td>9 Multiple Baseline Analysis Across Behaviors: Control Group -- Intern 5 and Model Teacher 5</td>
<td>125</td>
</tr>
<tr>
<td>10 Multiple Baseline Analysis Across Behaviors: Control Group -- Intern 6 and Cooperating Model Teacher 6</td>
<td>126</td>
</tr>
</tbody>
</table>
CHAPTER ONE

INTRODUCTION

The notion that student teachers' (Interns') instructional skills resemble the instructional skills of their cooperating teachers has been extensively suggested in education journals. In 1963 Iannaccone stated,

Much of the learning that occurs in student teaching seems to be antithetical to what the students have been taught in college. In fact, student teaching may be viewed as a period which helps the student teacher modify her behavior from what he or she was taught in college to what seems to be required on the job. (p. 74).

The process which mediates the suggested relationship between the cooperating teacher and intern skill usage could be explained by either Bandura's social learning theory (Bandura and Walters, 1963), or by Doyle and Ponder's (1975) notion that the use of a skill acquired by an intern is dependent upon the degree to which the skill is congruent with the ecology of the classroom in which he or she is student teaching, or by a combination of both theories.

Whatever theory one chooses to promote, it is widely accepted that since the time of Aristotle, the actions or behavior of one individual or group have been shown to influence the behavior of another (Kuehnert, 1977). Couple this comment with the suggestion that almost all learning can occur vicariously by observing others (Stephens, 1977), then one can begin to identify the potential significance of the cooperating teacher model. When the teaching intern is exposed to the teaching behaviors of the cooperating teacher, there exists the strong
possibility that a modeling effect will occur.

Obviously, depending on one's perspective, there are several issues which evolve from the cooperating teacher-intern dyad. Some of these include:

1. Is it appropriate to expose aspiring teachers to the sometimes inadequate instructional techniques of the cooperating teacher?

There is a strong argument for a very close relationship between the instructional skills of the teacher training program and the instructional skills of the cooperating teacher whose classrooms are used for intern teaching practice (Copeland, 1979).

2. Do we possess the analytical skills to know what constitutes effective teaching? And, if so, how do the administrators of teacher training ensure that the interns are exposed to teachers who exemplify effective teaching?

An effective teacher is generally accepted as someone who engages pupils in appropriate activities, for an optimal amount of time, at a high rate of success (Sledentop, 1983). The instructional methods used by teachers for achieving effectiveness vary. However, extensive classroom investigation (Medley, 1977; Rosenshine and Furst, 1971; and Stallings, 1980) has identified that certain teaching behaviors are more conducive to student learning than others.

The classroom research strategies and findings of Kounin (1970), Rosenshine (1979), Berliner (1979), Evertson and Brophy, (1978), Medley (1977), and Stallings (1980) have been recently applied to the gymnasium situation (Anderson and Barrette, 1978; Cheffers, 1977; Locke, 1977; McLeish, 1981; Metzler, 1979; Pieron, 1980; and Sledentop, 1983). What has evolved from these investigations has been the beginning of a solid knowledge base of the components of effective
physical education teaching.

Recently researchers in physical education have emphasized how to effect changes in teacher and intern behavior so that instruction resembles what we know to be effective teaching (Siedentop, 1981). In this regard the methods used to effect changes in teacher and intern behavior have ranged from peer-assessment (Dodds, 1975) to training the cooperating teacher to be the supervisor of the intern (Cramer, 1977; and Hutsler, 1977). The success of most of these investigations has highlighted the efficacy of ensuring that cooperating teachers can become examples of effective teaching.

3. What effect does it have on the intern-cooperating teacher relationship if the intern identifies conflicts between the college theory of teaching and those methods of the cooperating teacher?

It has been found (Lannaccone, 1963) that interns typically came to justify the actions of their cooperating teachers that had previously disturbed them as being in conflict with what they had been taught. They even used techniques or patterns of teacher behavior that they had already identified as violations of what they had learned at their training college (Lannaccone, 1963). Further, the interns reported that following the cooperating teacher's pattern worked to get them out of an immediate teaching dilemma (Lannaccone, 1963).

4. If interns teach in a gymnasium without the influence of a cooperating teacher would their instructional techniques remain constant with those expounded in the college methods courses? And would such an experience strengthen the impact of the courses, or would there be institutional (ecological) characteristics inherent in the gymnasium which would dilute that impact?

Theorists working in the classroom (Copeland, 1979) and gymnasium (Locke, 1979) stress the need to give greater consideration to the
Impact of the ecology of the school and its separate classrooms on not only the intern but also the experienced teacher. In this regard, Copeland (1979) suggests:

Student teachers' ability to use many skills they learn during their university training depends not only on the quality of the initial training they receive but on the environment in which they must practice use of those skills, their student teaching classrooms. (Copeland, 1979, p. 194).

He further argued that ecological congruence reinforced the intern's use of a skill and increased the likelihood that a skill would be used again.

Most of the above issues and many more have been addressed extensively in classroom research and to a lesser extent in the investigation of an intern's training in the gymnasium. Throughout the discussion of findings in these investigations it was often concluded that the interns' teaching behavior is primarily influenced by the cooperating teacher. Therefore, what needs to be investigated is the relative power of aspects of the cooperating teacher's behavior to cause the development of effective intern teaching; that is, the notion of "influence" needs to be operationalized and intensively examined.

Ironically, despite the almost universal acceptance of social learning theory (Bandura and Walters, 1963) this phenomenon has yet to be investigated in the gymnasium setting.

Dodds (1975) provides a detailed review of the research attempts to isolate those methods which most affectively mold intern teaching behavior. Typically modeling has been included as a necessary component in intern training but its effect has usually been masked by its concurrent application with other behavior modification strategies.
For example, Rife (1973), employed modeling, feedback, instruction, cueing and reinforcement as a packaged intervention to change the teacher behavior rates of managerial, positive and negative reactions to on-and-off task pupil behaviors.

**Purpose and Significance of the Study**

It was the purpose of this study to investigate the effect of a physical education cooperating teacher’s modeling of specific teaching behaviors on the incidence of those teaching behaviors in a physical education intern.

The purpose was appropriate in view of the following:

1. There has been dissatisfaction expressed with the results of college intern training supervision programs (Locke, 1979; Siedentop, 1981; and Stallings, 1983).

2. The existence of a financial squeeze emphasized the need to improve teaching using the resources already available, for example, cooperating teachers (Hutslar, 1977).

3. There was a decline in education standards and, therefore, a need to improve teaching (Travis, 1976).

4. The interns acquired a great deal of the mechanical and psychological behaviors of their cooperating teachers (Price, 1960).

5. Most of the feedback in the practice teaching situation came from the cooperating teacher (Trolsl, 1969).

6. There were ways of changing a cooperating teacher’s instructional skills (Moskowitz, 1966), although there was contradictory evidence which suggested that in some situations it is not possible to significantly change some of the behaviors of experienced physical education teachers (O’Sullivan, 1983).

7. It was possible to behaviorally describe and analyze an effective teacher in physical education (Siedentop, 1983).

8. There was a belief that there was a need for and a faith in the student teaching program (Prell, 1968).

9. An acceptance of social learning theory (Bandura and Walters,
1963) would suggest that interns could only acquire the necessary teaching skills if they were trained to discriminate and attend to the desired instructional skills before being exposed to their cooperating teacher's live modeling of effective teaching (McKenzie, 1982).

In a review of literature on modeling as it occurs in teacher training McKenzie (1982) states: "Since studies on the use of modeling to develop the teaching skills of physical educators have not been reported, the void remains to be filled by future innovative researchers" (McKenzie, 1982 p. 28).

Confirmation of the power of the cooperating teacher model to cause more rapid substantial and permanent gains in an intern's instructional skills would add impetus to the notion that interns should be exposed to cooperating teachers who consistently employ the most effective teaching behaviors. One of the limitations of such an endeavor is the lack of experienced physical education teachers who consistently model appropriate teaching behaviors (Anderson and Barrette, 1978; and Siedentop, 1981).

Research Questions

There were four specific questions that this study investigated:

1. Would a systematic intervention including verbal suggestions, feedback and modeling effect a significant change in intern behavior?

2. Would a systematic intervention including verbal suggestions and feedback effect a significant change in an intern's teaching behavior if the model teacher or cooperating model teacher did not model the target behavior?

3. Would the changes in an intern's teaching behavior be rapid, substantial, and lasting when he/she has observed a model teacher modeling the desired behaviors in conjunction with verbal suggestions and feedback?

4. Does modeling effect more rapid substantial, and lasting changes in intern behavior than verbal suggestions and
feedback?

Definitions

Imitation: an observer's behavior changes to resemble that of the model. It is essentially divided into two phases:

1. Acquisition, refers to when observing the model, the onlooker acquires conceptual images and verbalizations and stores them in his memory.

2. Performance refers to when the observer may perform, demonstrate new behavior or, after seeing the model, either increase or decrease a prior behavior (Bandura, 1971).

Modelling: is producing behavior which acts as a stimulus for the thoughts, attitudes or behavior of another individual who observes the behavior. Modelling then is the provision of an observable stimulus while imitation refers to the response of the observer (Marlott and Perry, 1975).


Symbolic modelling: the presentation of behavior by films, videos, audio tapes or written scripts (Marlott and Perry, 1975). Stephens refers to "symbolic modelling" as vicarious modelling.

Limitations

The study was limited in the following ways:

1. There were only six experimental subjects, three teachers and three Interns, and five control subjects, two teachers and three Interns included in the study.

2. There were only five elementary schools within two school districts included in the study.

3. Observation was limited to videotape recordings of each lesson which were subsequently reviewed and analyzed.

4. The entire study was restricted to ten weeks and it was only possible to conduct two observations of each subject each week. Therefore, the data for each subject was limited to a total of 20 observations.
5. Maintenance was restricted to four or less observations due to the unpredictable interruptions to the physical education programs of some of the subjects.

6. Reliability checks were limited to one check for each subject in each phase of the study.

7. The experimenter was also the supervisor of the six interns in the study.

8. There was no accountability mechanism employed to ensure that the cooperating teachers complied with the guidelines of the research.

9. The study was limited by the lack of power of the researcher to control the time and content of each class. This situation is typically attributable to the ecology of most physical education programs.

Summary

This chapter provided a concise introduction to the rationale for the purpose of the study. Questions to be addressed were enumerated, and the limitations and special terms were delineated.

The next chapter will address the review of related literature which is appropriate to the conducting of this study.
CHAPTER TWO
REVIEW OF RELATED LITERATURE

There are four separate and necessary sections of the literature from which the development of this study has been formulated. They are modeling, the design of modeling research, teacher effectiveness, and more specifically teacher training. Where possible the review has been restricted to include only the literature which provides a link between modeling, teacher effectiveness and teacher training.

Modeling

This review of modeling literature will identify the important features of modeling and imitation and ensure a more efficient study of the phenomena as they relate to physical education.

The purpose of this review is to

a. Identify the concepts modeling and imitation,

b. present literature which relates to the analysis of models and their ability to stimulate imitation,

c. relate the above two areas to cooperating teacher and intern interactions in physical education, and

d. provide the justification to investigate the capacity of cooperating teachers in physical education to affect an intern's teaching behavior through modeling.

Social learning theory, the notion that people learn social behavior through imitation, has warranted the attention of many researchers. In the 1950's, Rosebaum and Blake used groups of college students to investigate the effects of a model's behavior on the behavior of an observer. A typical example of their research was a
study conducted in 1955 in which two groups of 25 college students were exposed either to a model donating 25 cents to charity or to a model donating 75 cents to charity. The group exposed to the "25 cents" model gave, on the average, 32 cents to charity while the "75 cents" group gave 63 cents to charity.

Investigations of social learning theory continued through the 1960's and were dominated by the work of Bandura. A typical example of Bandura's work was the 1965 study involving 66 children aged 42-71 months. In this laboratory controlled study, groups of children were randomly assigned to one of four treatments:

a. exposure to a model receiving no consequences for aggressive behavior,

b. exposure to a model receiving reward for aggressive behavior,

c. exposure to a model being punished for aggressive behavior, and

d. receiving a positive incentive for accurate imitation of the model.

It was found that children were more aggressive if the model was rewarded for aggressive behavior and if they, the observers, received positive incentives for their imitation of the aggressive model.

Arising out of the findings of the pioneer efforts of Rosenbaum, Blake, Bandura and others (Maccoby and Wilson, 1957; Rosenblith, 1959; Kanareff and Lanzetta, 1960; and Walters, Bowen and Parke, 1964) were two basic theories of the modeling process:

1. Gewirtz and Stingle's (1968) Generalized Imitation Theory (cited in Martens, 1975) highlights three operations that are typical of the imitation process: a) the imitative response occurs either by chance, by direct training, or by direct physical assistance; b) the response is maintained by extrinsic reinforcement; and c) after several imitative responses, a set of diverse behaviors are acquired.
2. Bandura's (1969) Contingency-Mediational Theory (cited in Martens, 1975) highlights four operations that are typical of the modeling process: a) attention, which is the process of using verbal and visual cues to discriminate important aspects of the model; b) retention is the process of symbolic coding whereby the imitator overtly and/or covertly practices the behavior; c) motor reproduction is the process of practicing the behavior; and d) incentive is the process of increasing the motivation to imitate.

These theories have withstood the test of time and continue to provide the rationale for related research in all areas of human interaction.

Dunkin and Biddle (1974), when commenting on the status of modeling in the classroom, suggested 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." However, in this study the phenomenon, whereby the observer's behavior changes to resemble that of the model, was called imitation. Social modeling then is "... the process of observational learning in which the behavior of one individual or group, the model, acts as a stimulus for the thoughts, attitudes or behavior of another individual who observes the model's performance" (Marlatt & Perry, 1975). Therefore, modeling is the provision of an observable stimulus while imitation refers to the response of the observer. Bandura (1971) subdivides imitation into acquisition and performance phases. Acquisition refers to the onlooker, while observing the model, acquiring conceptual images and verbalizations and storing them in his or her memory. Performance occurs when the observer either demonstrates new behavior or, after seeing the model, increases or decreases a prior behavior.
Some authors (Dunkin and Biddle, 1974) have chosen to use the one label, modeling, to describe the entire interaction, while others (Westcott, 1979) prefer the adoption of both terms. This presents no problem provided the respective authors are explicit and consistent with their definitions and use of the terms. For the purpose of this review, Westcott's (1979) definitions were employed:

1. Model conditions are the conditions under which a model performs a behavior.
2. Model response is the specific behavior performed by the model.
3. Model consequences are the specific outcomes of the model's behavior (e.g., reinforcement).
4. Observation conditions are the specific conditions under which the observer performs imitative behavior.
5. Observer response is the specific imitative behavior of the observer.
6. Observer consequences are the specific outcome of the observers imitative behavior.

Two types of models are identified in the literature. Stephens (1977) refers to them as direct and vicarious while Marlatt and Perry (1975) label them as live and symbolic, respectively.

Live (direct) modeling is when the observer attends to real persons in real life settings and symbolic (vicarious) modeling is the presentation of models through films, videos, audio tapes or written scripts.

Bandura (1969), cited in Kuehnert (1977), summarized several studies (Bandura, Ross and Ross, 1961 and 1963; Kahn, Madsen and Becker, 1967; and Lovaas, 1961) and concluded that there was no difference between live and symbolic modeling in producing changes in
behavior. These studies were typically concerned with changing deviant behavior in the classroom setting while comparing live models to films. On the other hand, Kabler (1976), in Stephens (1977), in a summary of a review of literature comparing symbolic models with live models, stated that the effect of symbolic modeling on observer behavior was found to be in the same direction as live modeling but was significantly less potent.

Unfortunately, comparisons of the two modeling styles were confounded by variables which influenced the efficacy of the live model. One might argue that despite the possible negative effects of the uncontrollable variables in the performance of a live model, the live model is equal to or better than the symbolic model, therefore, there is no need to attend to these variables. However, this study was essentially concerned with optimizing the imitation of the most appropriate model. The very nature, permanent product, of symbolic models allows many variables to be controlled. But, in student teaching, the model is invariably live and therefore susceptible to making errors when modeling desired behaviors (Marlatt and Perry, 1975). Despite the advantages of preparing symbolic models for teacher training programs it must be assumed that interns will invariably be working with live models. For this reason the remainder of the review will be concerned, where possible, with live model investigations.

Discussion of other factors which, if appropriately manipulated, tend to facilitate learning through modeling will be guided by the components of modeling which were suggested by Stephens (1977) as being most important: a) attending, b) discriminating, c) characteristics of
models, d) characteristics of behavior, e) use of reward and punishment, and f) directions for observing.

**Attending**

There does not appear to be any lengthy discussion of the need for learners to pay attention to modeled behavior. Certainly, there is no reason to study whether or not the observer needs to attend to a model to be able to imitate that model. The variable, in this instance, is the ability of the observer to attend. This aspect was not a concern for this review, however, it should be noted that attending is an essential component of all potential learning situations. One study was cited by Stephens (1977) which indicated that shaping procedures produce significant increases in students' attention (Lovaas, Freitas, Nelson, and Whalen, 1967).

**Discriminating observations**

Observers need to be able to be selective in identifying the most relevant aspects of the model. In the Intern training program many of the cooperating teacher's behaviors may not appear to the Intern, to be reinforced. For example, a physical education teacher, when beginning a new unit of work, may devote an entire lesson to the managerial and organizational aspects of the unit. The apparent lack of student activity and possible student boredom in this situation may give the impression that the teacher is a poor teaching model, not worthy of imitation. However, a trained observer would identify that due to these initial teaching behaviors, later physical education lessons would be more effective in increasing activity time and reducing
managerial time because of the established organizational base (Emmer and Evertson, 1981). Young (1969) found that videotaped models were superior to written models and were most effective when accompanied by discrimination training which included the use of auditory and visual cues on the videotape. Discrimination in this instance involves being able to identify the cues which establish the appearance of a specified behavior. Knowing what to attend to is an important aspect of an intern's ability to imitate appropriate behaviors.

Teacher behavior does not change by just watching someone else teach. Some researchers suggest that in addition to modeling or as an alternative it is necessary to specify behavioral objectives and provide feedback to the intern on their progress made in attaining those objectives (Rife, 1973; Boehm, 1974; Darst, 1976). The evidence of the impact of discrimination training on the behavior of interns is provided in studies by Hough and Rohman (1969) and Bondi (1970), cited in Zeichner (1978), who found that interns who received training in interaction analysis prior to teaching, as well as receiving feedback during their teaching practice, more readily developed the required teaching behaviors of indirect Instruction.

In one program for developing protocol materials, Glessman and Pugh (1976) produced a film showing instances of the concepts of approving, disapproving, probing, informing, reproductive (lower-order) questioning, and productive (higher-order) questioning. When shown to students in educational psychology courses, the films raised scores on the tests of ability to categorize these behaviors.

Imitation in intern training would be enhanced by the ability of
the Intern observer to recognize and analyze those parts of the teaching act which make it effective. Unfortunately, few studies on teaching could be found which attended to this specific issue. There is, however, an awareness of its importance to the training of teaching interns. McKenzie (1982) states,

... simply exposing trainees to schools, students, and excellent teaching models is insufficient. Learners must be cued on what is to be watched and later performed (McDonald, 1973). Trainees need to be informed in advance what specific teaching skills they are to look for and expected to acquire. Various coding sheets and charts are available to cue preservice educators in observing teaching skills (Anderson, 1980; Siedentop, 1982). (p. 26).

Characteristics of models

Stephens (1977) reported that, "Imitation tends to occur more readily when models appear to possess physical characteristics (age, sex, race, etc.) similar to the observers and when the models are perceived as competent and powerful." (p. 216).

The belief that models should be similar to the observer has been extensively studied, particularly when analyzing the effects of modeling on peers in the classroom setting (Rosenblith, 1961; and Zander, Stotland and Natsoulas, 1961). Bandura (1971) advocated that there would be optimal imitation if the model's performance was only one or two achievable steps more advanced than the observer. This is supported by McKeachie and Kulik (1975) who, when studying achievement motivation theory with college student teachers, found that the greatest changes in behavior of students occurred when the expectations were neither too high nor too low, and only then if the behavior was within their repertoire.

An extensive series of studies reviewed by Pleron (1980), using
students of various age groups in elementary and high schools, found that role-model identification is strongly related to the perceived personal similarity between the subject and model. The fact that the child's classmates share a greater portion of his/her characteristics than do either the teacher or parents of the child means that it is not surprising to discover peer modeling has a significant influence on the behavior of classmates as a result of imitation (Rosenbaum and Blake, 1955; Csapo, 1972). One of the most interesting studies conducted with the intention of investigating the effect of a model's characteristics was a study by Thelen (1975), which found that being imitated by an adult had a significant influence on children's behavior. The children sought the company of the imitating adult and tended to also imitate that adult. The researcher has successfully employed this strategy in the training of autistic children.

The research convincingly supports the need for a model to not only have similar characteristics and be exhibiting achievable behavior, but also to share common interests with the observer (Rosenkrans 1967). It has been the experience of this researcher to be supervising students who have no intention of becoming teachers or who have a strong close-minded attitude about what and how to teach. Their interests often exhibit no resemblance to those of their cooperating teacher. Rarely did they imitate the instructional methods of their cooperating teacher model. The ramifications of such a situation become alarming when considered in conjunction with the findings of Rosenfeld (1969), who reported a reverse-influence effect. Cooperating teachers showed a significant decrease in their positive
attitude towards the children when they worked with close-minded interns.

There is another likely situation where, despite discrimination training and extensive preparation of the Intern for student teaching, those behaviors of the cooperating teacher (model) which are regarded as ineffective teaching behaviors are also modeled. Gage (1977) provides a pessimistic and relevant summary,

Student teaching has been the subject of much thinking, writing, and even some research over the decades. In general, it has been considered to be the single best, though far from faultless, component of teacher education programs. It has often been indicated as too unsystematic or unplanned, as unmanageable in its complexity, and as too much at the mercy of the idiosyncrasies of the cooperating and supervising teachers. Some appraisals have shown that student teachers hardly change their ways of teaching at all from the beginning to end of the student teaching period - and even that their attitudes and behavior tend to deteriorate, at least in the view of those who value nonauthoritarianism and nonpunitiveness in teaching. (p. 46).

The strength of the findings mentioned above are somewhat lessened because of the use of biased measures of the dependent variables (D. Siedentop, personal communication, July 25, 1984).

Unfortunately, most of the studies which investigate the effects of a model's characteristics utilize child to child or teacher/parent to child interactions to measure the relationships of model characteristics to the degree of imitation. Evidence to support the findings above for adult to adult interactions is lacking. Also, the distinct nature of each of these three types of interactions does not permit generalization from one to the other. However, the findings do follow the logic of accepted learning theory, that it is only possible to adopt behaviors whose requirements are within the limits of one's capacity, and imitation is more likely to occur if the desired
behaviors are challenging and achievable. It could logically be theorized that the more closely the model resembles the observer, the greater the chance will be for imitation to occur in all interactive situations.

*Characteristics of behaviors*

It is important to make the distinction between characteristics of models and the characteristics of the behaviors of those models and how they differentially impact upon the degree of imitation. Mussen and Parker (1961) investigated the effect of the characteristics of the model by measuring the degree of imitation between young girls (observer) and their mothers (model) in solving a maze problem. The independent variable was the pre-assessed level of closeness and togetherness (nurturance) between the mother and daughter. The more nurturant relationships produced the greatest imitation. Another study in this area was conducted by Rosenblith (1961) who found that kindergarten children, when completing a color matching task, tended to imitate the male model rather than the female model and in some cases preferred to imitate the opposite sex.

An example of a study designed to investigate the effects of the characteristics of the behavior of the model was conducted by Rosenkrans and White (1967) who found that fifth grade boys exposed to a model giving 50 percent of earned tokens to charity became more altruistic than those boys who were exposed to the same model who did not donate any tokens to charity.

Stephens (1977) proposes three important characteristics of model behavior: a) responses to be imitated should be clearly visible; b)
responses should be demonstrated by a variety of models, and c) the

target behaviors should be repeated often. Several studies have

alluded to the problem of locating cooperating teachers in the
gymnasium who clearly exhibit the appropriate teaching behaviors
(Cheffers and Mancini, 1978; McLeish, 1981; and Quarterman, 1977).

Copeland (1976) found that the extent to which a cooperating teacher
actually used a target skill in the classroom was associated with the
student teacher's use of the skill subsequent to training. Further,
the cooperating teacher's consistent utilization of the target skill in
the classroom causes that skill to become a functional part of the
classroom's ecological system. Thus, when a student teacher, who has
completed training in the use of a teaching behavior enters such a
classroom and attempts to utilize the skill, that attempt "fits" the
system (Doyle and Ponder, 1975).

A cooperating teacher who accepts the findings of Copeland (1976)
would be hesitant to alter his behaviors to become a more appropriate
model (assuming the present model is not appropriate) for the benefit
of the Intern because the resultant ecological incongruence may prevent
reinforcement of the teacher's or Intern's use of the newly acquired
teaching behavior.

Zelchner (1980) expounds the value of repeating behaviors to
enhance the observer's degree of imitation. He provides a summary of
functionalist studies and, in so doing, identifies yet another possible
variable, one which further complicates the measurement of a
cooperating teacher's influence upon the Intern. Zelchner (1980)
states,
Socialization of the teacher occurs largely through the internationalization of teaching models during the thousands of hours spent as a student in close contact with teachers as models. The view is that the prospective teacher is not a tabula rasa awaiting inscription and locates the major socializing influence of a point prior to the advent of formal training experience (p. 12).

Knowing that some interns may have been exposed to a consistent teaching style, exhibited by a variety of teachers throughout their pre-college schooling, it is difficult to imagine that 3 to 10 weeks with one cooperating teacher will cause dramatic changes in the already imitated behaviors of the intern, unless the cooperating teacher is highly competent and powerful.

Some researchers (Fischer and Fischer, 1979) would suggest that the exposure of interns to inconsistent teaching behaviors within and across models is a good thing. It encourages the development of individuality in their teaching style. Fischer and Fischer (1979) analyzed teachers and students to identify and measure teaching styles and concluded,

. . . people can be identified with distinctive qualities of behavior that are consistent through time and carry over from situation to situation. Since the very idea of style is based on a commitment to individualization of instruction and the development of the learner autonomy, styles that encourage undue conformity and dependence are not acceptable to us (p. 5).

However, on the other hand, Welsbeck and Buchmann (1981), from a field study in teacher education, found that to be influenced by a professional teacher, who models only one teaching style, does not mean that subtle and complex moves toward independence and thoughtfulness cannot occur. Despite the conflicting evidence cited above, it was decided to use behaviors based on one teaching style in this study.

The lack of consistency in the use of behavior, and the sometimes
subtle differences in the appearance of a similar behavior across cooperating teachers, as well as the difficulty involved in utilizing and defining a behavior in a particular ecological setting, are problems requiring further study in relation to modeling.

Use of rewards and punishment

In a summary of a review of the research which linked modeling to the use of rewards and punishment Stephens (1977) concluded,

Behavior is learned faster through modeling when it is accompanied by rewards. Students should observe such behavior being rewarded and they should observe undesirable behavior being punished. When students are being trained on self-reinforcement, a consistent model is important (p. 216).

The study of vicarious reinforcement has been extensive. Bandura and McDonald (1963), Kanfer and Marston (1963) and Bandura (1965) studied vicarious reinforcement and indicated that seeing a model receive reinforcement for his/her behavior is sufficient incentive for imitative behavior on the part of the observer. This, of course, assumes that the observer perceives the reward to be desirable. Which means that the reinforcer used with the model has to be a reinforcer for the observer.

Also, direct reinforcement of the imitator increased the likelihood of imitative behavior (Bandura and Harris, 1966; Baer, Peterson and Sherman, 1967; and Liebert and Allen, 1967), the imitator in the student teacher setting being the intern.

The type and amount of reinforcement required to encourage imitation of the teacher by students has been reported by Flanders (1968) and Masters (1972). They determined that maximal incentive
conditions are more effective than moderate or minimal for eliciting emulative behavior.

Students who display competent classroom behavior receive reinforcement from the teacher and thereby become models for other students who value reinforcing events. This is even more likely to occur if imitating the competent student is the goal of instruction (Masters, 1972).

Although most of the studies of reinforced models involve children, and specifically peer modeling, logical generalization is possible to other situations. Consider the common scenario of the physical education teacher, whose trim physical condition reflects an active existence, demanding that his/her pupils perform rigorous exercise regimes so that they can be "healthy and fit to pursue life to the fullest". Whether this physical education teacher exercises or not is irrelevant. The students are going to imitate the teacher because of the possibility of becoming as trim as their teacher, who appears to be so committed to exercise. The students would tend to surmise that the consequences for participating in conditioning behavior are a trim body and considerable attention.

Teachers should model the behaviors they want their students to acquire (Gage, 1972; Sledentop, 1976) and ensure that these behaviors are seen to be rewarded. To relate this to the student teaching situation, the cooperating teacher needs to model behavior which produces student responses that are perceived as being reinforcements for the teacher's behavior. The Intern might regard a reward for his imitative behavior as being an improvement in the students' skills and
an attentive, motivated class.

Directions for observing

Kuehnert (1977) stated,

Research has demonstrated the influence of social modeling in changing the verbal, social and emotional responses of individuals of varying ages, classifications and problems. Social modeling occurs incidentally and yet effectively in numerous settings as people naturally imitate the behaviors of others. When systematically planned and implemented, modeling has been shown to increase self-confidence and social adjustment and promote sobriety in alcoholics. It has resulted in the skillful use of behavior modification procedures by workers with the mentally retarded and altered the persistency levels of university students. In view of these results, it appears reasonable to believe that social modeling could be used for teaching study skills, reducing the withdrawal rate, and increasing student satisfaction with personalized courses (p. 33).

Kuehnert's rationale is important to the development of a case for controlled observation in student teaching as opposed to relying on incidental social modeling. Role modeling is a "strong silent" way of teaching. However, the presence of imitation does not guarantee that what is modeled is appropriate or desirable (Welsbeck and Buchmann, 1981).

The adoption, in physical education, of behavioral observation systems proposed by Siedentop (1983) would provide a means through which college supervisors, cooperating teachers and interns could attend to specific model responses. One could assume, if it was possible to generalize Kuehnert's conclusions, that such an approach to physical education student teaching would enhance imitation and thus overall teaching development, provided the modeling procedures were systematically planned and implemented.

Teacher Training

The purpose of this section was to briefly identify various
Investigations of teacher training methods and to specifically highlight those studies which attempted to analyze modeling in teacher training. A multitude of teacher training methods pervade teacher education institutions. These methods are typically couched in a few general categories or combinations of the same. The categories include methods courses, microteaching, minicourses, inservice courses, discrimination training courses, and practical teaching experience. Gage (1978) in reporting the findings of several studies concluded that all of the above training methods, under certain circumstances, positively effect changes in teacher behavior.

The Ohio State University supervision research program under the direction of Sledentop (1981) provided the first systematic effort in physical education to change the teaching skills of interns during teaching practice. The program began with a study by Hughley (1973), who found that daily feedback on behavior rates significantly changed intern behavior. This initial effort was then systematically replicated (Darst, 1974; Boehm, 1974; and Hamilton, 1974) to further substantiate Hughley's (1973) results. In the investigations which followed, by Dodds (1975), Dessecker, (1975), Hutslar (1976), and Cramer (1977) it was found that it was possible to train intern peers and cooperating teachers to successfully adopt the supervisor role and cause desired changes in intern teaching skills (Sledentop, 1981).

Apart from this systematic effort to improve the supervisors' strategies employed in teacher training programs most of the studies have been uncoordinated and isolated.

Dodds (1975) provided a review of the behavior change techniques
used in inservice training and student teaching. The following is a summary of those findings cited in Dodd's (1975) which contributed to the orientation of this study:

1. An investigation of the effects of videotaping, audiotaping, and supervisory conferences, using Flander's Interaction Analysis System (F.I.A.S.), as techniques for self evaluation of student teachers found no significant difference in the improvement of student teacher performance among these three conditions (Ree, 1972).

2. Griffin (1973), compared teacher-supervisory conferences with self-appraisal via videotape in their effects on flexibility in the verbal interaction patterns of inexperienced teachers. After treatment both experimental groups increased their flexibility in verbal interactions with their pupils. Although videotaped self-feedback produced greater flexibility it was not at a level to be statistically significant.

3. Morris, (1972), found no difference between self-supervision and university supervision on student teachers' classroom performances.

4. Burklund (1972), found no difference, in an Intern's attempt to utilize the content of supervisory messages in their teaching practice, between Intern's who received printed and audiotaped materials without university personnel supervision and Interns who had supervisory attention in addition to the printed and taped materials.

5. Edgar (1972), reported that teacher reactions toward target children were not found to be significantly different after training sessions in behavior modification procedures than before.

6. Cooper, Thomson, and Baer (1970), observed that, with no theoretical training in reinforcement principles, two teacher subjects were able to increase their positive responses to appropriate pupil behaviors by receiving feedback about their performance. This feedback took the form of information regarding the frequency with which the teachers attended to appropriate behaviors and information about the frequency of not attending to appropriate responses.

7. Saudergras (1972), found that teacher praise increased or decreased with the systematic setting of criterion rates.

8. Wilde (1972), examined the effects of training Interns in reinforcement principles. The dependent variables included
Intern approvals, disapprovals and errors in both of these categories. Errors consisted of positively reinforcing an inappropriate pupil response or negatively reinforcing an appropriate pupil response. The Interns with reinforcement training had higher frequencies of approval responses for pupil's appropriate behaviors and lower frequencies of disapproval of inappropriate responses.

9. Traill (1970), provided one group of Interns with feedback of the data collected on their teaching as well as the basic instruction about the observation system, while the other group of Interns had only instructions with no feedback on their performance. The feedback made significant differences in the Intern's percentage of verbal behavior in each category.

10. Grinsberg (1973), found that videotaped analysis of an Intern's teaching can significantly increase the Intern's employment of probing questions.

11. Scott (1972), found that supervisor conferences with or without video feedback were equally effective in changing the target behaviors (rhetorical question-asking) in Interns.

12. Golladay (1973), indicated that reading a behavior modification text or a combined intervention of reading with receiving feedback on teaching performance could increase rates of teacher contingent praise and decrease rates of punishment. When cueing was added as a third treatment variable, there were significant changes in the desired direction for both teacher behaviors.

13. Grandy (1973), reported that when specific performance-criterion rates, feedback from observations, and experimenter praise were added, teacher approvals for pupils academic and social behavior rose.

The above summary is representative of only a few of the abundant studies which attend to various aspects of teacher training. All of the works, with few exceptions, reviewed by Gage (1978), Sledentop (1981) and Dodds (1975) confirm that there are many teacher training strategies, some better than others, which can cause desired changes in an Intern's teaching skills. Unfortunately it has been reported (Copeland, 1976; Iannaccone, 1963; and Locke, 1979) that the shaping of an Intern's effective teaching behaviors was greatly hindered, and in
some instances prevented, by the lack of congruence between the desired teaching skills and those skills being modeled by the cooperating teachers.

McKenzie (1982) in a brief overview of research on modeling and its implications for teacher training programs stated, "Cooperating teacher should be selected on their ability to model what trainees are to learn as well as their ability to cue and reinforce appropriate responses" (p. 27). Perhaps such a demand is premature despite its logical roots.

Although there have been several classroom studies (McAuley, 1960; Johnson, 1969; Karmos and Jacko, 1977; and Evans, 1976) which reported the influence of a cooperating teacher's modeling of teaching skills on the performance of teaching skills by an intern few have endeavored to show that live modeling is more powerful than other methods of behavior change. That is, powerful enough to partially negate the effects of other proven behavior change strategies.

Teacher education researchers have based the intent and design of their investigations on what is already known about modeling. The following are the few studies which represent the most recent attempts to investigate the effect of modeling on the behavior of training teachers:

1. Allen, Berliner, McDonald and Sobol (1967) used a 2 x 2 x 2 factorial design to investigate the effects of written and perceptual models on 150 secondary education interns. They found that the perceptual model who modeled positive instances, behaviors which have been identified as required in the teaching process, produced the greatest change in imitative behavior.

2. Koran (1969) used a post-test only true experimental design to investigate the effects of a videotape model compared to a written model on 33 female elementary education majors. The
videotaped model produced the greatest imitation of appropriate teaching behavior.

3. Zevin (1974) used a pre-test, post-test, control group, true-experimental design to investigate the effects of college theory classes compared to the modeling effect of a cooperating teacher's instructional methods on the behavior of 32 college interns. The interns imitated the behavior of the cooperating teacher rather than adopting the methods advocated in the college theory courses. It was also found that some interns used teaching styles which resembled neither the cooperating teacher nor the college methods.

4. Clark, Macrae, Ida and Smith (1975) used a multiple baseline changing criterion design with repeated single cases to investigate the effects of a combination treatment which included written instructions, teacher modeling, verbal feedback, and consequences administered by the college supervisor on the imitation and adoption of predetermined teaching strategies. The intervention was shown (graphically) to significantly affect the behavior of the intern. Unfortunately, with this study as with many others the influence of the cooperating teacher model was masked by the presence of other components in the training package.

5. King (1980), as a follow up to her 1975 study, conducted a pre-post experimental field study designed to determine whether the use of a coping (imperfect) model or a lecture/discussion style would cause a significant change in the use of three behaviors shown by 48 undergraduate students enrolled in two classes of a course in elementary health methods. Significant changes occurred in the coping-model group on two of the three target behaviors. Significant differences between groups were reported for all three behaviors.

6. Lange (1971), used a pre-test/post-test control group design to assess the effect on the teaching behavior of female interns who observed a videotaped, model teacher who demonstrated a high I/D ratio of the Flanders Interaction Analysis observation schedule. The control group were exposed to a neutral movie. The study demonstrated that a one-time-only treatment was successful in changing student behavior on such gross measures as the I/D and revised I/D ratios. At the conclusion of the study Lange (1971) recommended that: a) the behavior needed to be modeled on several occasions to enhance its lasting effect; b) other variables and discrimination training (Bandura, 1977) should be added to the treatment to assess the effect; and c) the video taped model should be experimentally manipulated with certain personality factors with the intention of providing optimal conditions for imitation to occur (Bandura and Walters, 1963).
The findings of these studies further support the investigations of modeling in other situations. The above teacher training studies reinforce the notions, supported by data, that: a) perceptual models are more effective than symbolic models (Kabler, 1976); b) modeling was more powerful than college theory courses (Copeland, 1979; and Locke, 1979); and c) imitation occurred throughout an intern's life as a student (Zeichner, 1980).

The research supporting the overall influence that cooperating teachers have on interns in the classroom is abundant:

1. Iannaccone (1963) conducted a qualitative analysis of the daily diaries and logs of 25 student teachers who spent a large portion of one semester in elementary school classrooms observing, assisting, and teaching under the direct guidance of an experienced cooperating teacher. He found that suggestions, information and evaluations provided by cooperating teachers tended to change the student teacher's perspectives concerning classroom management and levels of expectations. Iannaccone concluded by stating, "They (Interns) even used techniques or patterns of teacher behavior that they had previously identified as violations of what they had learned at college. Further they found that following the cooperating teacher's pattern worked to get them out of the immediate dilemma";

2. Price (1961) and Seperson and Joyce (1973) studied 19 student teachers and concluded that the influence of the cooperating teacher caused interns to acquire many of their classroom practices and occurred during the first few weeks of internship (student teaching) rather than as a result of cumulative impact;

3. McAulay (1960) found that students were greatly influenced by their cooperating teachers concerning the methods and materials they used in their classroom the following year;

4. Flint (1965) and Mitchell (1969) both reported, when studying the verbal behavior of interns in the classroom, growth during student teaching of strong relationships between the attitudes and even the performance of student teachers and their cooperating teachers;

5. Johnson (1969) showed that interns further approximated their cooperating teachers on a scale of dogmatism by the end of the teaching practice;
6. Karmos and Jacko (1977) found that Interns believed that their cooperating teacher had the greatest significant influence on the experience of practical student teaching; and

7. Evans (1976) found that cooperating teachers seem to have a strong influence on the attitudes and behaviors of student teachers.

This serial presentation of classroom studies confirms the support for: a) the influence of the cooperating teacher; b) the effect of a cooperating teacher model on an imitating Intern; and c) that the components of an effective model are extensive.

Modeling studies have recently been initiated in physical education. The only two studies located in the literature (Rolider, 1978; Westcott, 1978) observed and analyzed the modeling effects of a physical education teacher on the behavior of students and not the effects of the teacher on the Intern, which is the major concern for this investigation. Westcott (1978) reported that students from teams with high levels of teacher encouragement provided significantly more encouragement than students from teams that had low levels of teacher encouragement.

Rolider (1978) examined the relative effectiveness of teacher modeling, instruction, and grade incentives on the frequency of supportive verbalization among peers in a university basketball class. Compared to the two other treatments, instruction had the least effect on increasing the rate of positive statements. Grade incentives were most effective, and modeling had a marked effect on increasing positive interactions between students (McKenzie, 1982).

While the classroom studies reinforce the notion that an Intern imitates the behavior of a cooperating teacher, "other research has
began to illustrate the part that the ecological characteristics of classrooms and schools plays in shaping the behavior of those who work in schools (Copeland, 1979; Doyle, 1977) (Hodges, 1982, p. 25).

It has become evident that interns may readily adopt the ways of methods courses or modeled behavior while in teaching practice settings. But, because the school in which they eventually teach, following their teacher training, has different facilities, class sizes, behavior rules, and so forth, the interns modify their teaching method accordingly.

In 1978, Copeland conducted a study of 32 intern subjects, 23 females and 9 males. He compared the effects of different models and different ecologies on the intern's use of the target skill, "asking probing questions". The results showed no significant difference between scores of interns who had taught under high or low scoring cooperating teachers. But the results did show significant differences in scores which were attributable to the nature of the classroom ecological system. Copeland (1978) concluded that ecological congruence reinforces the intern's use of the skill and increases the likelihood that the skill will be used again. The implication for teacher training programs therefore, is that for modeling to be most effective the required teaching behaviors should be a part of the cooperating teacher's teaching skills a considerable time before the intern is exposed to the situation.

The first issue to consider is that modeling has the potential to be an efficient method of promoting the transfer of behavior from the cooperating teacher to the intern. Provided certain criteria are
controlled, the modelling/imitation strategy has been shown to be a powerful tool in education (Copeland, 1978).

The optimizing of models influence is enhanced when:

1. He/she is reinforced for his/her behavior;
2. he/she has desired status;
3. he/she has access to desired resources;
4. he/she has desired competencies;
5. He/she is similar to the observer;
6. he/she models skills that are within the observers repertoire.
7. He/she matches the observer condition (ecology) as nearly as possible to the model conditions; and
8. He/she reinforces both his/her own and the observer's imitative behavior (Westcott, 1979).

The second issue worthy of consideration is therefore, that the Intern-cooperating teacher relationship in the physical education setting has the potential to be critical to the development of an Intern's teaching style.

There are no studies in physical education teacher education or in classroom teacher education which demonstrate that live cooperating teacher modelling of instructional skills causes a more rapid, significant, or lasting change in Intern teaching skills than is the typical standard cooperating teacher practice, as observed by this researcher throughout 8 years of supervising student teaching in 2 different countries at 50 different elementary and high schools, of providing oral and written feedback. Feedback was usually presented either as a few brief notes on the Intern's lesson plan or in verbal form at a cooperating teacher/Intern conference during recess or after
school was dismissed.

**The Design of Modeling Research**

The purpose of this section was to investigate the designs, subjects, analyses and treatments employed in a selection of studies reported in a review of modeling literature by Westcott (1977). Of these studies, chosen because of their difference in purpose, a further selection process located studies specifically relating to teacher training. Only four studies were found which investigated the effects of modeling in the teacher training.

It was not surprising to find that in the Westcott review the only study specializing in physical education was that produced by Westcott (1977). Westcott mentions in his conclusion that, "... 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 the playing fields and gymnasium" (p. 212).

Many studies are not included in this section of the review because they were either replications or contained components already highlighted by the studies presented previously in this review of literature.

Several interesting trends appeared in the formulation of a chronological list. Trends which can provide useful insight into the most effective way to conduct modeling research.

Studies occurring after Westcott's 1976-77 literature review have been attended to in the previous sections on modeling and teacher training. It was, therefore, not essential to the purpose of this review to include those studies.
Table 1 is a brief synopsis of the methods used in research into modeling techniques and their effect on behavior (1955-76).

Table 1 reveals some interesting trends and consistencies which have guided the methods used in this study. Some of the more interesting and significant aspects of the synopsis include:

Prominent authors in the field were Blake and Rosenbaum in the 1950's, Bandura in the 1960's, and Koran in the late 1960's to early 1970's. Subjects, other than in the Lefkowitz, Blake and Mouton (1955) study and the Bryan and Test (1967) study, are either college students or elementary age boys and girls. One could assume that the choice of subject is based on the convenience for data collection. The college students were selected from the college of the researcher concerned and the elementary school children were selected from districts in close proximity to the researcher's college.

The reason for concentrating on young children, despite the fact that there are adolescent studies not presented in this summary (e.g., Wagner and Cirillo (1968) investigated two hundred and forty 8, 10, 12, 14, 16 and 18 year olds) could be that in young children there has been less prior learning, elementary classes are more stable, and/or that young children respond more to "everyday" stimuli. This being the case then it is crucial to establish appropriate models for infants to observe through their childhood because many of their behaviors become stimulus controlled during the child's early formative years. One could argue that an intern, on teaching practice, is like a child in that many of their teaching behaviors become stimulus controlled during their teaching practice. Therefore, it is just as crucial to establish
<table>
<thead>
<tr>
<th>Researcher(s)</th>
<th>Year</th>
<th>Subjects</th>
<th>Design</th>
<th>Type of Study</th>
<th>Analysis</th>
<th>Treatments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rosenbaum, Blake &amp; Duryea</td>
<td>1955</td>
<td>50 College, Grad. Stud.</td>
<td>R X1 0, R X2 0</td>
<td>true-experimental, -nested</td>
<td>Comparison of means, t-test</td>
<td>X1-exposure to models who gave 25 cents each to charity, X2-exposure to models who gave 75 cents each to charity</td>
</tr>
<tr>
<td>Lefkowitz, Blake &amp; Mouton</td>
<td>1955</td>
<td>Pedestrians at an intersection</td>
<td>R X1 0, R X2 0</td>
<td>true-experimental, -nested</td>
<td>Comparison of means, t-test</td>
<td>X1-exposure to a high status (expensively dressed) model violating traffic lights, X2-exposure to a low status (shabbily attired) model violating traffic lights, X3-Control group not exposed to a model at pedestrian crossing lights</td>
</tr>
<tr>
<td>Rosenbaum &amp; Blake</td>
<td>1955</td>
<td>Students in a college library</td>
<td>R X1 0, R X2 0</td>
<td>true-experimental, -nested</td>
<td>Comparison of means, t-test and Anova</td>
<td>X1-exposure to a model who accepts an invitation to participate in psych experiment, X2-exposure to a model who rejects an invitation to participate in psych experiment, X3-control not exposed to a model when asked to participate in psych experiment</td>
</tr>
<tr>
<td>Maccoby &amp; Wilson</td>
<td>1957</td>
<td>600-7th grade children</td>
<td>X1 0 X2 0</td>
<td>Single group combined &quot;one shot&quot; and &quot;pre- and post-test&quot;</td>
<td>Self-report and questionnaires</td>
<td>X1-simultaneous presentation of high and low S.E.S. model in a film, X2-simultaneous presentation of male and female models in a film, NB! Comparisons were made between subjects sex and S.E.S. and the model that they identified with in the film</td>
</tr>
<tr>
<td>Kibball &amp; Blake</td>
<td>1958</td>
<td>90 College students</td>
<td>R X1 0, R X2 0, R X3 0, R X4 0</td>
<td>true-experimental</td>
<td>Comparison of percentages</td>
<td>X1-no thirst (normal crackers) students exposed to a model ignoring &quot;do not drink&quot; sign, X2-thirst (hot sauce crackers) students exposed to a model ignoring &quot;do not drink&quot; sign, X3-no thirst (normal crackers) students exposed to a model adhering to the sign, X4-thirst (hot sauce crackers) students exposed to a model adhering to the sign</td>
</tr>
<tr>
<td>Rosenblith</td>
<td>1959</td>
<td>Kindergarten children</td>
<td>R X1 0, R X2 0</td>
<td>true-experimental, -nested</td>
<td>Comparison of means, t-test</td>
<td>X1-observing a model perform the maze task correctly, X2-no model present but rather having extra trials to perform maze task</td>
</tr>
<tr>
<td>Researcher(s)</td>
<td>Year</td>
<td>Subjects</td>
<td>Design</td>
<td>Type of Study</td>
<td>Analysis</td>
<td>Treatments</td>
</tr>
<tr>
<td>---------------</td>
<td>------</td>
<td>----------</td>
<td>--------</td>
<td>---------------</td>
<td>----------</td>
<td>------------</td>
</tr>
<tr>
<td>Kamareff &amp; Lenzetta</td>
<td>1960</td>
<td>Not known</td>
<td>R X₁₀ X₃₀</td>
<td>true-experimental</td>
<td>Comparison of means, t-test</td>
<td>X₁-experiencing contrived failure on an individual task</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>R X₁₀ X₄₀</td>
<td>nested and crossed</td>
<td></td>
<td>X₂-experience contrived success on an individual task</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>R X₂₀ X₃₀</td>
<td></td>
<td></td>
<td>X₃-exposure to a model having 50% success on a critical task</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>R X₂₀ X₄₀</td>
<td></td>
<td></td>
<td>X₄-exposure to a model having 80% success on a critical task</td>
</tr>
<tr>
<td>Walters, Bowen &amp; Parke</td>
<td>1964</td>
<td>60 male college students</td>
<td>X₁₀ X₂₀</td>
<td>Single group combined &quot;one shot&quot;/pre- and post-test</td>
<td>Comparison of means, t-test</td>
<td>X₁-exposure to model's eye movements while concurrently observing the film (nude and seminude males and females) that the model was watching</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X₂-no model but observing a parallel film in the presence of a female</td>
</tr>
<tr>
<td>Rosenblith</td>
<td>1961</td>
<td>Kindergarten children</td>
<td>O₁X₁₀C₂₀X₂₀</td>
<td>Repeated single subject multiple schedule</td>
<td>Comparison of color types</td>
<td>X₁-exposure to a male model choosing pencil colors and completing a maze</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>O₃X₀₄₀X₄₀₀₀₅</td>
<td></td>
<td></td>
<td>X₂-exposure to a female model choosing pencil colors and completing a maze</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X₃-exposure to a model attending to the child during play</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X₄-exposure to a model withdrawing attention during play</td>
</tr>
<tr>
<td>Stotland, Zander &amp; Natoules</td>
<td>1961</td>
<td>70 college women</td>
<td>R X₁₀</td>
<td>true-experimental</td>
<td>Self-report questionnaire correlational lational</td>
<td>X₁-exposure to a model of similar musical preference</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>R X₂₀</td>
<td>nested</td>
<td></td>
<td>X₂-exposure to a model of dissimilar musical preference</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Given other attributes of the model, the subject was tested to see if she would assimilate them in her own self-concept.</td>
</tr>
<tr>
<td>Bandura, Ross &amp; Ross</td>
<td>1963</td>
<td>Children</td>
<td>X₀</td>
<td>pre-experimental</td>
<td>Not known</td>
<td>X-simultaneously exposed to two models, one was the controller of attractive resources while the other was the recipient of resources</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>one shot case study</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bandura</td>
<td>1965</td>
<td>66 children</td>
<td>R X₁₀₁₄₀₄₀₄₀₄₀₅</td>
<td>true-experimental</td>
<td>Analysis of group comparison variance and t-test</td>
<td>X₁-a model receiving no consequences for aggressive behavior</td>
</tr>
<tr>
<td></td>
<td></td>
<td>42-71 months</td>
<td>R X₁₀₂₂₈₀₄₀₅</td>
<td>nested and crossed</td>
<td></td>
<td>X₂-exposure to a model receiving reward for aggressive behavior</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>R X₃₀₇₄₄₀₆</td>
<td></td>
<td></td>
<td>X₃-exposure to a model being punished for aggressive behavior</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X₄-positive incentive provided for accurate imitation of the model</td>
</tr>
<tr>
<td>Researcher(s)</td>
<td>Year</td>
<td>Subjects</td>
<td>Design</td>
<td>Type of Study</td>
<td>Analysis</td>
<td>Treatments</td>
</tr>
<tr>
<td>--------------</td>
<td>-------</td>
<td>----------</td>
<td>--------</td>
<td>---------------</td>
<td>----------</td>
<td>------------</td>
</tr>
<tr>
<td>Mussen &amp; Parker</td>
<td>1965</td>
<td>young girls</td>
<td>R0X10 R0X10</td>
<td>Ex post facto pre-Analysis of test post-test variance control</td>
<td></td>
<td>X1-mothers modeled solving a maze problem NBI Groups were established on preobservation of the closeness and togetherness of the mother and daughter-an attribute of nurturance or non-nurturance</td>
</tr>
<tr>
<td>Bandura, Grusec &amp; Menlove</td>
<td>1966</td>
<td>children (7-11 yrs)</td>
<td>R X10 R X20 R X30</td>
<td>true-experimental Comparison of means, t-test t-test</td>
<td></td>
<td>X1-passive observation condition-observed a movie of a model responding variably X2-active symbolization-subject verbalized every action of the model X3-competitive symbolization subject counted while watching the film</td>
</tr>
<tr>
<td>Rosenhan &amp; White</td>
<td>1967</td>
<td>150 fifth grade boys and girls</td>
<td>R X10 R X20</td>
<td>true-experimental t-test</td>
<td></td>
<td>X1-exposure to a model giving 50% of earned tokens (5 cent certificates to charity) X2-exposure to a model not giving any tokens (5 cent certificates) to charity</td>
</tr>
<tr>
<td>Bryan &amp; Test</td>
<td>1967</td>
<td>4,000 car drivers</td>
<td>R X10 R X20</td>
<td>true-experimental t-test</td>
<td></td>
<td>X1-exposure to a model assisting a woman fix a flat tire X2-no model was present before the motorists saw the broken down vehicle</td>
</tr>
<tr>
<td>Liebert &amp; Allen</td>
<td>1967</td>
<td>3rd &amp; 4th graders</td>
<td>R X10 R X20</td>
<td>true-experimental t-test</td>
<td></td>
<td>X1-direct training-children received a token when their score exceeded 20 X2-subject observed a model receiving a reward for a score over 20</td>
</tr>
<tr>
<td>Rosenkranz &amp; Hartup</td>
<td>1967</td>
<td>Nursery school children</td>
<td>R X10 R X20 R X30 R 0</td>
<td>true-experimental t-test comparison of means</td>
<td></td>
<td>X1-a model verbally reinforced for performing aggressive responses X2-a model verbally punished for performing aggressive responses X3-a model sometimes rewarded and sometimes punished X4-control group, not exposed to the model</td>
</tr>
<tr>
<td>Researcher(s)</td>
<td>Year</td>
<td>Subjects</td>
<td>Design</td>
<td>Type of Study</td>
<td>Analysis</td>
<td>Treatments</td>
</tr>
<tr>
<td>-----------------------</td>
<td>------</td>
<td>----------</td>
<td>--------</td>
<td>---------------</td>
<td>-----------</td>
<td>------------</td>
</tr>
<tr>
<td>Allen, Berliner, McDonald &amp; Sobol</td>
<td>1967</td>
<td>150 Interns</td>
<td>R X1 0</td>
<td>true-experimental</td>
<td>one-tailed t-test</td>
<td>X1-subjects performed own lesson after observing a written model (positive instances)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Secondary Education</td>
<td>R X2 0</td>
<td>true-experimental</td>
<td>factorial</td>
<td>X2-subjects performed model lesson after observing a written model (positive instances)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R X3 0</td>
<td>R X4 0</td>
<td>R X5 0</td>
<td>R X6 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X3-subjects performed own lesson after observing a written model (mixed instances)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X4-subjects performed model lesson after observing a written model (mixed instances)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X5-subjects performed own lesson after observing a perceptual model (positive instances)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X6-subjects performed model lesson after observing a perceptual model (positive instances)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X7-subjects performed own lesson after observing a perceptual model (mixed instances)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X8-subjects performed model lesson after observing a perceptual model (mixed instances)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NB1 positive instances are when only those required behaviors are present</td>
</tr>
<tr>
<td>Craig</td>
<td>1967</td>
<td>80 under-grads volunteers</td>
<td>R X1 0</td>
<td>true-experimental</td>
<td>ANOVA</td>
<td>X1-observers and performers were given shock treatment when performer erred</td>
</tr>
<tr>
<td></td>
<td></td>
<td>40 male</td>
<td>R X1 0</td>
<td>true-experimental</td>
<td>2X2 factorial</td>
<td>X2-observers and performers were not subjected to shock treatments</td>
</tr>
<tr>
<td></td>
<td></td>
<td>40 female</td>
<td>R X2 0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Berger</td>
<td>1966</td>
<td>72 under-grads</td>
<td>R X1 0</td>
<td>true-experimental</td>
<td>t-test</td>
<td>X1-model announced and overtly practiced 6 selected hand signals from 26</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R X2 0</td>
<td>R 0</td>
<td>z-scores</td>
<td>X2 (Chi2)</td>
<td>X2-model announced only, did not overtly practice 6 from 26 hand signals</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X3-no model was observed, subjects only made their own 6 choices from 26 hand signals</td>
</tr>
<tr>
<td>Berger</td>
<td>1966</td>
<td>60 under-grads</td>
<td>R X1 0</td>
<td>true-experimental</td>
<td>t-test</td>
<td>X1-model announced and overtly practiced 6 out of 26 hand signals</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R X2 0</td>
<td></td>
<td>z-scores</td>
<td>X2 (Chi2)</td>
<td>X2-observer watched the model but was informed that they would not be required to participate in the training practice</td>
</tr>
<tr>
<td>Researcher(s)</td>
<td>Year</td>
<td>Subjects</td>
<td>Design</td>
<td>Type of Study</td>
<td>Analysis</td>
<td>Treatments</td>
</tr>
<tr>
<td>--------------</td>
<td>------</td>
<td>----------</td>
<td>--------</td>
<td>---------------</td>
<td>----------</td>
<td>------------</td>
</tr>
<tr>
<td>Berger</td>
<td>1966</td>
<td>24 undergrads</td>
<td>R $X_1$ $0$ R $X_2$ $0$</td>
<td>true-experimental</td>
<td>t-test</td>
<td>X$1$-exposure to a model choosing the most popular items from 26 signals</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>z-scores</td>
<td>X$2$-exposure to a model choosing the most unpopular items from 26 signals</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X$^2$ (Chi2)</td>
<td>NBI: the most popular were those chosen most often by X$3$ group in 21a</td>
</tr>
<tr>
<td>Rosenkranz</td>
<td>1967</td>
<td>90 Boy Scouts</td>
<td>X $0$</td>
<td>one shot case study</td>
<td>frequency or behavior</td>
<td>X-exposure to a model performing specific maneuvers in a simulated war strategy game</td>
</tr>
<tr>
<td>Koran</td>
<td>1969</td>
<td>33 female elementary educ. majors</td>
<td>R $X_1$ $0$ R $X_2$ $0$</td>
<td>true-experimental</td>
<td>t-test</td>
<td>X$1$-exposure to a videotaped model of the desired behavior</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X$2$-exposure to verbal directions only on how to teach</td>
</tr>
<tr>
<td>Zevin</td>
<td>1974</td>
<td>32 College Interns</td>
<td>R $X_1$ $0$ $X_1$ $0$-- $X_1$--$X_1$ $0$ R $X_2$ $0$ $X_2$ $0$-- $X_2$--$X_2$ $0$ $X_20$</td>
<td>true-experimental</td>
<td>ANCOVA</td>
<td>X$1$-Interns were exposed to lecture recitation style cooperating teacher</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>pre-post</td>
<td>X$2$-Interns were exposed to an inquiry style of cooperating teacher</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NBI: both groups had weekly lectures with a supervisor who encourage the use of Inquiry method</td>
</tr>
<tr>
<td>Brody and Zimmerman</td>
<td>1975</td>
<td>elementary school children</td>
<td>R $0$ $X_1$ $0$ R $0$ $X_2$ $0$</td>
<td>true-experimental</td>
<td>ANCOVA</td>
<td>X$1$-exposed to a film model displaying proximate teaching situation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>pre-post test control group</td>
<td>X$2$-exposed to a film model displaying distant teaching situation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NBI: proximate-one foot separation, distant-five feet separation from teacher to student</td>
</tr>
<tr>
<td>Clerk, Macrae &amp; Smith</td>
<td>1975</td>
<td>6 Interns</td>
<td>Multiple base- line &amp; changing case criterion</td>
<td>Repeated single line &amp; changing case criterion</td>
<td>Graphic &amp;</td>
<td>The successive inclusion of each of the five components of the training package -- I) written instruction, II) modeling of the teaching skill, III) student performance of the teaching skill, IV) verbal feedback from the regular teacher and v) consequences administered by the college supervisor.</td>
</tr>
</tbody>
</table>
### TABLE 1

The Design of Studies Conducted to Investigate the Effect of Modeling on Learning and Behavior

<table>
<thead>
<tr>
<th>Researcher(s)</th>
<th>Year</th>
<th>Subjects</th>
<th>Design Type</th>
<th>Type of Study</th>
<th>Analysis</th>
<th>Treatments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Westcott</td>
<td>1976</td>
<td>500 elementary students &amp; 39 teachers</td>
<td>Descriptive</td>
<td>Ex post facto and quasi-expl.</td>
<td>One way ANOVA</td>
<td>Data were collected using coding methods on the frequency and rate of encouraging statements used by athletic coaches in various situations, compared to the encouraging behavior of their elementary students. X1-exposure to a model giving prompts to subjects for encouraging behavior. NB! Some of the methods of analysis were assumed from the type of design and treatment employed. These studies and/or abstracts did not contain the methods of analysis.</td>
</tr>
</tbody>
</table>

**NOTE:**

- $X_1 = $ treatment 1; $X_2 = $ treatment 2; and so forth.
- O = observation
- R = random assignment of groups to treatment levels.
appropriate models for the practicing intern as it is for the young child.

Prior to the 1970's, the design which dominated this area of research was the true-experimental, post-test only, control group comparison design. Such a design has some internal validity problems unless the experimenter incorporates mechanisms of control of the extraneous variables. Selection of subjects would be the major threat to internal validity. Because there was no pre-test, the groups may have been different before they began the treatment. This was somewhat controlled by random assignment of the subjects to treatments combined with the presence of a simultaneously tested control group.

External validity was limited by the selective nature of each of the accessible populations. When considered separately, the studies only encourage significant conclusions about the subjects tested. However, the fact that many studies have been conducted using various subjects, ecologies and times, adds to the external validity of the findings.

Those studies conducted in the natural setting have greater external validity when investigating the effects of modeling. However, there are so many possible extraneous variables that the researcher was almost bound to the laboratory in an effort to make discriminative conclusions about which aspect of the observer/model interaction caused the change in behavior. An example of this problem was found in the study of pedestrians by Lefkowitz, Blake and Mouton (1955). They suggest that the high S.E.S. model caused more people to violate the traffic lights than the low S.E.S. model. It may have been that in
both instances the model only influenced the first person to imitate the behavior while the others were influenced by some other valued person also at the crossing at the time.

There had been attempts to use more convincing designs prior to 1970. Rosenbluth (1961) used a repeated single subject multiple schedule and Bandura (1965) and Mussen and Parker (1965) used pre-test post-test control group designs.

The trend, after 1970, was toward greater a) external validity and thus the move of researchers into natural setting; b) the introduction of baseline designs (e.g., Clark, Macrae, Ida and Smith's (1975) multiple baseline changing criterion design); and c) the consistent attempts to include pre and post-test control group designs, (e.g., Zevin's 1974 combination of pre-test/post-test control group design with a time series design).

The constraints of education settings (e.g., Intact classrooms) limited some studies to quasi-experimental, ex post facto, or single case designs. In the teacher education setting, the intern-cooperating teacher dyad is most responsive to single case research which can develop its external validity from replications conducted at the various teacher education institutions throughout the world.

Despite the limitations of a large proportion of earlier research, a substantial amount of conclusive evidence has been developed which supports the impact of modeling. Today's researcher can now employ more rigorous designs and be more adventurous. He/she can confidently speculate a cause/effect relationship between the model and observer because of the security associated with the many confirmations of the
properties of the modeling phenomenon.

All the studies reviewed incorporated a similar treatment strategy whereby an observer (subject) witnessed the performance of a model and then was given the opportunity to perform the task. The control group was in most cases another group exposed to a different model and/or a group not exposed to a model.

Data collection was either in the form of frequency and rate of performing a specific task (e.g., Rosenbllth's (1961) recording of the type of color pencil children select after being exposed to a model selecting certain colors to complete a maze) or frequency and rate measures combined with coding devices used to discriminate behaviors (e.g., Zevin's 1974 extension of the Flander's Interaction Analysis System, used to code the behavior of college interns).

In all studies, an observer was required to collect data. Those studies like Zevin's in which more sophisticated data collection methods and behaviors were used, the researcher's used interobserver agreement to establish the reliability of measurements.

The inability to randomly select subjects limited the research in the true-experimental, ex post facto, survey or single case studies. Of these the true-experimental designs have dominated modeling research, particularly the post-test only control groups design.

Early studies relied on t-tests for comparison of means while the later, more sophisticated factorial designs incorporated analysis of variance and in the case of pre-test studies analysis of co-variance. Graphs were used extensively particularly in single case research as a means of indicating differences among groups and/or treatments.
All statistical analyses were directed to the .05 or .01 level of significance while the researcher's confidence in the effects of modeling allowed for the anticipated use of one-tailed t-tests and one-way analyses of variance.

In most studies, an effort was made to conduct treatments in the natural setting. If not materials used and verbalizations of instructions were typical of the natural setting. Occasionally, experimenters allowed themselves to be involved in the study (e.g., Westcott (1976) modeled the prompting and encouraging behavior for some of the groups in his study and Zevin (1974) provided one of the treatments for all of his subjects). What these studies lost in possible experimenter bias a few other studies lost in the artificial nature of the environment used.

One of the most appealing studies is that of Clark, Macrae, Ida and Smith (1975) who used a multiple baseline, changing criterion design to assess the effects of various modeling methods on behavior. The graphic results are convincing and remove the fear of treatment interaction.

**Teacher Effectiveness**

The purpose of this study is to investigate the power of the cooperating teacher model to cause changes in the Intern's teaching behavior. To this end the review of literature has so far concentrated on: firstly, identifying modeling and imitation and those factors which cause the model to be imitated more readily; secondly, on teacher training research and specifically the influence of a cooperating teacher model on an Intern; and thirdly, on the research designs
employed to capture the desired cause/effect or correlational relationships. The final section of the review of literature will serve the purpose of identifying those teaching behaviors which, if manipulated, would result in more effective teaching. A selection of these behaviors were used to assist in the investigation of the research problem.

The categories for the following review have been gleaned from Siedentop (1983). Siedentop presents the findings of classroom teaching research under five general labels: ingredients, method, strategies, climate and management of effective teaching. Each of these is briefly discussed.

**Ingredients of effective teaching**

The effective teacher is one who finds ways to keep students appropriately engaged in the subject matter at a high percentage of time and does so without resorting to coercive, negative or punitive classroom techniques" (Siedentop, 1982, p. 41).

The notion that the amount of time a student was successfully engaged in making academic responses was a possible determinant of student achievement (Berliner, Cahan, Filby, Fisher, Mavlava, and Moore, 1976; Brophy and Evertson, 1976; and Hall, Delquadri and Harris, 1977), led to a large scale investigation of various aspects of instructional time named the Beginning Teacher Evaluation Study (BTES). BTES specifically identified three important variables of time which influenced student achievement:

1. **Allocated time** refers to the time a teacher designates for instruction and/or practice in a given subject matter area.
2. **Engaged time** refers to that portion of allocated time that a student is paying attention or is engrossed in the subject matter.

3. **Academic learning time** (ALT), refers to that portion of engaged time when the student is involved with materials or participating in activities that are appropriate to his/her abilities and carry enough to ensure a high success rate (Fisher, et. al. 1978) cited in Reese (1983).

A typical example of a study which investigated the concept of instruction time was a correlation study by Rosenshine (1979). In this study one teacher taught for 30 minutes with the students engaged 80 percent of the time and the other teacher taught for 60 minutes with the students engaged for 65 percent of the time. Rosenshine found that the second teacher's students covered proportionally more books than did the equally bright students of the first teacher.

It was not long before the ALT concept was applied to the physical education setting (Sledentop, Birdwell and Metzler, 1979) where the evaluation of the causes of student achievement had been thwarted by a lack of ability to control extraneous variables.

Since this recent beginning of the investigation of ALT and its off-shoot Academic Learning Time-Physical Education (ATL-PE) the definition of this effective teaching variable has become more sophisticated. Sledentop (1983) proposed that the main ingredients of effective teaching in today's schools appear to be:

1. maximum time devoted to substantive content;
2. high rates of on-task behavior among students;
3. success orientated learning (appropriate matching of content to student abilities);
4. a warm positive climate; and
5. optimal class structure to develop high rates of on-task behavior (p. 41).
Methods of effective teaching

The most common teaching pattern associated with high rates of learning has been found to be direct instruction (Rosenshine, 1979). Rosenshine identifies the characteristics of direct instruction as being: a) an academic focus; b) teacher directed using sequential and structured materials; c) clearly stated goals; d) continuous and sufficient time allocation; e) extensive content coverage; f) continually monitored performance; g) low level cognitive questions resulting in high successful responses; h) immediate and academic feedback; i) structured but not authoritarian interaction; j) convivial academic atmosphere; and k) a goal to move students through a sequenced set of materials or tasks.

Rosenshine and Furst (1971) were able to synthesize the results of 50 studies into the above 11 complex categories of teacher behaviors. Although Rosenshine and Furst criticized some of the methodology embodied in most of the research they reviewed, Heath and Neilson (1974), were far more critical. In a review of the same literature Heath and Neilson (1974) concluded that: a) many operational definitions included in the behavior studies do not correspond well with the identified independent variable; b) randomization procedures are largely ignored; c) statistical assumptions underlying data analyses were unchecked; and d) Rosenshine and Furst are accused of ascribing significance in some studies wherein the original author did not.

Despite this brief blow to the integrity of the Rosenshine and Furst review many of their identified characteristics of direct
Instruction have been given further consideration. Recent reviews (Brophy, 1979; Medley and Crook, 1980; and Berliner, 1980) of educational research have highlighted those teacher behaviors that correlate consistently with student achievement. The following are some of the pertinent findings which support Rosenshine and Furst's components of direct instruction:

1. Students taught with a structured curriculum by a teacher who gave clear directions and directed the activity do better than those taught with individualized or discovery learning approaches (Brophy, 1979).

2. Most of the pupil time, in effective classrooms, is structured with relevant (academic) tasks (Medley, 1979).

3. Effective teachers use the lecture/demonstration method followed by monitored student practice (Brophy, 1979).

4. High teacher monitoring acts resulted in greater student engaged time (Berliner, 1979).

One could, therefore, suggest that the effective classroom teacher is someone who employs characteristics of direct instruction. However, clearly there are situations in which other teaching methods would be more appropriate. There are four considerations for variations on the main theme of direct instruction which according to Siedentop (1983) are well documented:

1. The developmental status of the learner;
2. the aptitude of the learners;
3. the socio-economic status (S.E.S.) of the learner; and
4. the subject matter being studied.

Siedentop (1983) in a review of literature concluded,

Notice that the low aptitude, educationally disadvantaged and less mature students all require even stricter adherence to direct instruction format and more attention to building a nurturant positive climate. As students move along these channels toward
greater maturity, away from their starting disadvantaged status, and toward higher level skills despite their aptitude, they tend to profit from a gradually decreasing teacher-centered, controlled format and can benefit eventually from what is generally referred to as heuristic instruction (p. 50).

Strategies of Effective Teaching

It is bewildering to list the many components of each individual teacher's instructional template. Therefore, this section will report only those teaching strategies which were identified by Rosenshine and Furst (1971), cited in Smith (1971), as being the most research-supported strategies out of their list of 11 components of direct instruction:

1. Clarity of presentation was the teacher performance variable with the strongest empirical link with student achievement (Belgard, Rosenshine, and Gage, 1968; Fortune, 1967; and Wright and Nuthall, 1970);

2. Variability of teaching was reported in three studies (Anthony, 1967; Furst, 1967; and Rea, 1964) to be significantly related to student achievement.

3. Five studies (Conners and Elsenberg, 1966; Fortune, 1967; Kleinman, 1964; Solomon Berdek and Rosenberg, 1963; and Wallen, 1966) showed a significant relationship between teacher enthusiasm and student achievement.

4. The Fortune (1967) and Kleinman (1964) studies also gave correlational support for task orientated and/or business like behaviors as being determinants of student performance.

5. Three studies (Hussen, 1967; Rosenshine, 1968; and Shutes, 1969) identified the fifth behavior strongly associated with achievement as being student opportunity to learn criterion material which is sometimes referred to as "content covered".

Rollider (1979) in discussing the fifth behavior warned that, "A unique problem associated with this category (student opportunity to learn criterion material) lies in its label. Note that while the category implies teacher action, it is more descriptive of an environmental condition for students than an overt teacher behavior" (p. 17).
Another problem associated with, not only the fifth behavior, but also the other four is the difficulty identifying an acceptable generic definition for each behavior. To some researchers enthusiasm is stimulating and imaginative teacher behavior versus dull and routine teacher behavior (Ryans, 1960) while others refer to it as vocal inflection, gesturing, eye contact, and/or animation (Coats and Snidghens, 1966). Several of the component behaviors of enthusiasm are high inference behaviors (e.g., stimulating) requiring subjective judgement or rating for identification. While other behaviors are low-inference (e.g., smiling) and are easily recorded as frequency counts. Good behavioral definitions are needed to ensure that firstly, research of teacher effectiveness can build a universally acceptable knowledge base and secondly, that teachers can readily apply that knowledge to the practical situation.

**Climates of effective teaching**

Medley (1977), supports the notion that a warm, positive climate is conducive to greater achievement. Those aspects of the climate which Medley found to be most conducive to learning included fewer teacher rebukes, less criticism, more praise and positive motivation.

Few concerned teachers would argue with Medley's findings. However, it should also be noted that a review of literature reveals that both positive and neutral climates produce greater achievement than negative climates with neither being more effective than the other. Some negative climates have also been shown to produce learning (Soar and Soar, 1979).
Management of effective teaching

One could argue that without appropriate management strategies, which includes the prevention of disruptive behavior, the other components of effective teaching would lose their impact.

It is not the purpose of this review to discuss the many idiosyncratic management strategies of classroom teachers. Suffice to say that it is generally accepted that effective teachers minimize the time taken to manage the class by developing clear and unequivocal classroom structures and routines (Kounin, 1970).

One of the most significant research findings in this area is that effective teachers teach most of their management structure in the first three weeks of the year rather than throughout the year as the needs arise (Emmer and Evertson, 1981). This seems to be supported by Kounin's (1970) notion that preventing situations in which student misbehavior might occur is much more important to successful teaching than specific techniques to remedy misbehavior.

The relationship between the control of misbehavior and management is reported in several discussion of effective teaching. Medley (1977) reported that efficient management correlated with less disruptive behavior which, in turn, resulted in decreased management time. More time would, therefore, be available to engage in academic tasks. Medley also found that the management of learning tasks was more readily implemented when working with the whole class than with small groups. Logically a teacher could maintain closer supervision of one group's activity than the activity of several groups. Particularly in the physical education setting where students are often well spaced and
difficult to monitor continually.

The prevention of disruptive behavior and the maintenance of task orientation go hand in hand. Kounin (1970) found several strategies in the effective teacher's repertoire which prevent disruptive behavior and, therefore, encourage greater task orientation and reduce the amount of management time. These strategies were: a) with-it-ness, knowing what students are doing, at all times during instruction; b) overlapping, being able to deal with two or more issues during class time; c) momentum, keep a lesson free from stops and breaks; d) group altering, keep the children on task; and e) accountability, make the children accountable for all required tasks.

**Teacher effectiveness in physical education**

Having briefly dealt with the components of effective teaching in the classroom, it is appropriate to relate these findings to the physical education setting (gymnasium) and more specifically to the purpose of this study.

Although the research on effective teaching in physical education is in its infancy (15 years old) over 100 studies containing approximately 2,000 separate teaching situations have been diligently carried out (Sledentop, 1983). Those researchers who pioneered the physical education effort based their observations on the assumption that, despite the many ecological differences between the gymnasium and the classroom, the instructional techniques would be similar and what works in one would work in the other (Locke, 1979).

Initial physical education teacher studies were purely descriptive and produced the following consistent findings:
1. The teacher's managerial behavior which included substantive and non-substantive, verbal and non-verbal approaches to organizing, changing of activities, directions about equipment and/or formations, and taking care of classroom routines, average between 20-22% of class time (Morgenegg, 1978) in Sledentop (1983).

2. The teacher's instructional behavior, which included verbal or non-verbal approaches to lecturing, demonstrating and other communications of information occupied, on the average, 30% of class time. It is interesting to note that, like the classroom, 90% of teaching styles used were teacher directed while 5% were task style of teaching (Pieron, 1980) in Sledentop (1983).

3. The teacher's monitoring behavior, the time spent observing students without interacting, occupied 20-45% of the class time (Anderson and Barrette, 1978).

4. The teacher's interacting behaviors including praising appropriate behavior, reprimanding inappropriate behavior, providing feedback, criticizing, and accepting students ideas and feelings, occupied 3-16% of class time (McLeish, 1981) in Sledentop (1983).

5. The teacher's feedback behaviors including positive, corrective, and negative skill feedback and positive, nag, and nasty non-academic feedback occurred 1-5 times every minute. Of these Cheffers and Mancini (1978), in Sledentop (1983), found 53% were evaluative while Sledentop (1983) found 80% to be either corrective feedback or nags.

Knowing that academically engaged time was positively and highly correlated with learning, the researchers were interested to discover the amount of student engaged time which resulted from the above percentages of teacher behavior. Table 2 presents the findings of four major research programs which sought to describe the students' behavior in the gymnasium.
TABLE 2

STUDENT TIME DATA FROM FOUR MAJOR RESEARCH PROGRAMS

<table>
<thead>
<tr>
<th>Student Behavior</th>
<th>McLeish</th>
<th>Pieron</th>
<th>College</th>
<th>Ohio State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management</td>
<td>20%</td>
<td>6%</td>
<td>13%</td>
<td>22%</td>
</tr>
<tr>
<td>Waiting</td>
<td>22%</td>
<td>32%</td>
<td>25%</td>
<td>24%</td>
</tr>
<tr>
<td>Receiving Information</td>
<td>22%</td>
<td>23%</td>
<td>25%</td>
<td>15%</td>
</tr>
<tr>
<td>Engaged Motor Time</td>
<td>26%</td>
<td>30%</td>
<td>27%</td>
<td>21%</td>
</tr>
</tbody>
</table>


One could only conclude from these findings (Table 2) that the methods being employed by physical education teachers do not represent effective teaching. Hopefully, it would be possible to increase the engaged motor time of students from 20-30% to 50% of the class time. This could be achieved by decreasing the time devoted to each of the other student behaviors, particularly management and waiting behaviors.

Most researchers (Anderson, 1978; Pieron, 1980; Sledentop, 1983) would agree with McLeish's summary statement about what constitutes effective teaching in physical education,

Effective teaching means structuring the lesson to maximize the amount of time in direct practice by each individual at a level which at once ensures a continuing development of the skill compatible with the maximum number of mistakes" (McLeish, 1981, p. 29).

It would, however, be futile to suggest to a beginning teacher that the above five lines stated by McLeish are the essence of
teaching. The obvious question is what behaviors must a teacher overtly exhibit to produce high rates of ALT-PE? It is assumed that ALT-PE (Sledentop, 1983) and achievement are positively correlated (Dodds and Rife, 1983; Metzler, 1982; Sledentop, Tousignant and Parker, 1982) and that there is strong support for the relationship between the components of direct instruction (Rosenshine and Furst, 1979) and student achievement. Therefore, logically direct instruction and ALT-PE may be correlated. The research to demonstrate the link in physical education is limited (e.g., McKenzie, 1981). However, some of the initial research efforts concerned with effective teaching in physical education have shown the following:

1. Monitoring or supervision refers to the ways teachers keep track of student behavior. A study by Tousignant and Sledentop (1983) revealed that there were four main forms of monitoring; 1) to observe, 2) to officiate, 3) to observe and give corrective feedback, and 4) to make permanent records of student task accomplishment. The results also indicated that silent and distant observation mostly prevented misbehavior while permanent recording was associated with a higher rate of on-stated-task behavior. Another interesting finding was that the rigor of the monitoring influenced the student behavior whereby monitoring was an antecedent stimulus which indicated a high probability of a particular response to be reinforced (Tousignant and Sledentop, 1983).

2. Enthusiasm is many behaviors because essentially it has been defined as those behaviors which emphasize, enlarge, and
elaborate on what is already typical and comfortable for the individual (Rollder, 1979). Most of the work in this area has been conducted in the classroom where recently Gillett (1980) found that student time on task was positively and significantly related to teacher enthusiasm.

Collins (1977) identified the following as being the commonly accepted indicators of a teacher's enthusiasm: a) smiling; b) much movement; c) many adjectives; d) varied voice; e) rapid speech; f) detailed planning; and g) the teacher participates with the students.

3. Feedback in its various forms has received a great deal of attention in the discussions of effective teaching in physical education. Pieron (1981) found that more effective teachers provided more feedback to individual students and reacted more often and more specifically than less effective teachers. On the other hand Graham, Soares and Harrington (1983) found that more effective teachers gave less feedback than less effective teachers. These conflicting reports are supported by Yerg (1981) and therefore, the effect of feedback appears to be situation related.

4. Demonstrations have always been an essential part of teaching. Pieron (1982) found that master teachers use more demonstrations than beginning teachers while Anderson and Barrette (1978) reported that effective teachers provide at least six demonstrations each class. On the other hand Locke and Nixon (1973) claimed that one demonstration is enough.

There are many issues yet to be investigated concerning
demonstrations in physical education. Who should demonstrate, teacher or pupil? How many bits of information is optimal for various age groups? How many times should one skill be demonstrated and is this dependent upon the complexity of the skill?

Motor learning theory provides logical and laboratory tested solutions to some of these issues. However the void still needs to be filled with applied investigation.

5. Managerial behavior appears to be the major concern of most interns. In a study of 25 interns, Iannaccone (1983) found that, for the Intern, teaching meant managing the class through an entire lesson. The purpose of managerial behavior in teaching physical education is to reduce the number of managerial episodes, the amount of managerial time and the amount of transition time to structure gymnasium routines and to maintain the momentum and flow of the lesson (Sledentop, 1983).

What teacher behaviors increase the probability that these elements will occur? Some of the more typical strategies suggested by Sledentop (1983) include:

Control the initial activity, for example, post the starting positions of activity groups on the notice board before class.

Begin class at a definite time to establish punctuality and routine.

Use a time-saving method for roll call for example, have students sign themselves in when they enter the gym.

Teach a signal for attention, use a whistle blast to mean stop and listen.

Include high rates of feedback and positive interaction, provide positive feedback to those managing themselves well in the gymnasium.
Post records of the management performance of students.

Use enthusiasm, hustles and prompts.

Employ a management game for quick results, children are rewarded for achieving managerial goals within a game format.

Overlap, deal with more than one event at a time without losing the momentum of either.

Thrugs involve bursting in on an ongoing activity. The teacher should avoid thrugs by timing the point of entry into an activity on the basis of the activity's flow.

Magnetizations occur when the teacher is captured by an irrelevant event. The teacher should avoid becoming magnetized by some small irrelevant event.

Dangles and flip-flops involve not completing planned activities. The teacher should avoid finishing an activity before it is complete and also avoid leaving an activity to later return to that activity.

Overdwellling is when a teacher engages in a chain of actions or talking that goes well beyond what is necessary for students to understand. This should be avoided.

Fragmentation, group fragmentation should be avoided because it causes waiting which results in misbehavior and activity fragmentation causes the activity to lose its meaning to the student.

Some of the above strategies have been found to exist in the repertoires of effective teachers in physical education (Siedentop, 1983). Employment of these strategies would reduce the management time in physical education and thus increase academic learning time (ALT-PE). A priority, according to the literature, in becoming an effective teacher.

6. Several educators have emphasized the importance of management routines (Ringer, 1973; Soar and Soar, 1979; and Clark and Elmore, 1979) in reducing disruptive behavior, teacher interactions and pupil transitions.
7. Positive reinforcement has been known to increase appropriate behavior. "Studies show that teacher praise can function as a reinforcer by increasing specific student behavior when made contingent upon performance of that behavior" (Reese, 1983).

In the early elementary grades, praise correlates weakly but positively with student achievement in low S.E.S. on low ability classes while it does not correlate at all or correlates weakly, but negatively, in high S.E.S. or high-ability classes (Brophy and Evertson, 1976; Stallings and Kaskowitz, 1974).

According to Sledentop (1983), "The best way to motivate your students to behave appropriately is to interact with them in a positive manner when they are showing appropriate behavior" (p. 93).

The purpose of this brief review of some of those behaviors identified in the literature to be conducive to effective teaching in physical education, has been to highlight those specific behavior categories which appear in the interventions used in this study. The review was limited because the nature of the intervention behavior categories was of secondary importance to the purpose of this research.

Summary

The first section of the review of literature, modeling, provided an in-depth understanding of the characteristics of a model and the characteristics of the model observer (imitator) relationship which facilitate the most appropriate observer imitation. Studies were cited which identified these components in both the laboratory and natural settings.

Next the review of literature concentrated on teacher training. A
brief overview of the methods employed to effect the appropriate changes in intern behavior was followed by a more intense synopsis of the practical training of teachers and how the process of modeling was employed as a method of changing intern behavior. Only two studies attended to modeling in the physical education domain, however, these were not studies of teacher training.

The third section was a chronological presentation of a selection of studies from Westcott's (1979) review of modeling literature. These studies were chosen because of their ability to reflect the variety of methods (subjects, designs, analyses and treatments) employed in modeling research rather than to present the findings of the included studies.

Teacher effectiveness was the concern of the fourth section. Following a general overview of the recent advances in teacher effectiveness the review concentrated on physical education and specifically those behaviors of effective teaching used as interventions in this study.

Arising out of the review of literature were several interesting and guiding conclusions:

1. Modeling is a powerful facilitator of appropriate or inappropriate behavior change.

2. There are teaching behaviors which, in physical education, are more effective than others in producing student achievement and ALT-PE which, in turn, results in student achievement.

3. Many researchers report the extensive imitation of cooperating teachers by their training interns.

4. Teachers can be trained using a variety of methods to acquire effective teaching behaviors. However, it has yet to be shown that the modeling of effective teaching behaviors by a cooperating teacher, in physical education, is more cost
effective in producing intern development than the standard training practices of student teaching.

5. The most appropriate method employed to investigate modeling as an intervention in a teacher training program was a multiple baseline, across behaviors, changing criterion design. This is a single-case experimental design which has been used extensively in the investigation of behavior change strategies in the natural setting. The review of literature identified a trend toward this type of design in the investigation of modeling.

In conclusion, given; a) the power of the model, b) knowledge of effective teaching behaviors, c) methods to conduct controlled rigorous investigation of modeling in the student teaching setting, and d) the dissatisfaction with the supervision of student teaching, there was a justification and need for this study.
CHAPTER THREE

METHODS AND PROCEDURES

This chapter begins with a description of the six interns and their respective models involved in the study and describes how the subjects were selected and the nature of the setting in which they were observed. The second section of the chapter provides detailed definitions of the behaviors used as the dependent variables and indicates the reasons for selecting these behaviors. In the next section the methods used to assist the cooperating teachers (models) to acquire either a new behavior or the modification of an established behavior are outlined. This is followed by a discussion of the observation instrument, interobserver agreement, reliability and the steps taken to avoid observer drift. Then, in the fifth section the details of the intervention strategy and the design of the study are presented. Finally, this chapter elaborates on the methods employed to analyze the data and will review the critical decisions made throughout the study to overcome the threats to the control of extraneous variables.

Subjects and Setting

The subjects in this study were six interns from the Ohio State University (O.S.U.) and six cooperating teachers, four from a suburban school district situated in a semi-rural area and two from a suburban school district situated in the built-up portion of a large city. All of the cooperating teachers were elementary school teachers and were
chosen because the experimenter had worked with them as a supervisor during student teaching practice. Each of them expressed an interest in the O.S.U. program and, when asked, willingly accepted the opportunity to be involved in the study. They were approached individually by the experimenter and were only informed of the mechanics of their role. At no stage were the cooperating teachers made aware of the purpose of the study, however, it became evident that four of them had anticipated, following the introductory meeting, the purpose of their own involvement with their assigned Intern.

Prior to the selection of the cooperating teachers a prospectus (see Appendix A) was formally accepted by the superintendents of both school districts. Due to the time constraints a letter of request (see Appendix B) was simultaneously sent to each of the physical education heads of department at the respective schools. This allowed the experimenter time to establish the rapport necessary to begin the preliminary organization of data collection.

The six Interns were assigned to their respective cooperating teachers according to the typical placement procedures adopted by the College of Education in consultation with the coordinators of the teacher training program in the physical education department. This entire process was out of the control of the experimenter and was conducted by the controlling parties who had limited prior knowledge of the experimenter's research intent. The physical education program coordinator needed to be aware of those schools being used in the study so that the experimenter could be assigned to those schools as the supervisor of student teaching. The physical education coordinator was
also cognizant of the purpose of the study.

The Interns were not informed of the study but were made aware that, as part of their student teaching, they would be videotaped by their supervisor at least twice each week in the elementary school throughout the ten weeks of student teaching. All of the Interns responded favorably to the prospect of video analyses of their teaching. Signed consent forms were not required because the research was to be a normal component of the student teaching experience and essentially did not alter the nature of student teaching.

The following is a brief description of each of the cooperating teachers, followed in each case by a description of their assigned Intern and the setting in which both subjects taught. The reason for presenting the subjects (cooperating and model teachers and Interns) in this way was because each pair, cooperating teacher and Intern, were the components of a single-case study replication, and also because the modeling literature indicates that the imitation of a model is more likely if the model has similar characteristics to the observer (see review of literature, p. 16). For the purpose of this study the cooperating teacher was the individual responsible for communicating (providing feedback and instruction and evaluating lesson plans, unit plans, and practical teaching) with the Intern while the model teacher was the individual whom the Intern observed teach. In most situations, the cooperating teacher and the model teacher were the same person.

Cooperating Model Teacher 1 was a 26-year-old single female teaching for her fourth year in the elementary school as a physical education teacher. She represented her high school and college in
gymnastics and coaches women's gymnastics at the high school level and at a private club. An interest in educational movement is reflected in the movement emphasis in kindergarten, grade one and grade two. At the time of the study she was completing the requirements for a qualification which would enable her to be appointed to a vacant position as a general science teacher at the high school.

Intern 1 was a 23-year-old single male who, throughout his college program, had taught all grade levels in elementary and high school at six different schools. His teaching grades for the three field experiences prior to the study were B, B, and B+, and he had a grade point average (G.P.A.) of 3.00. This subject represented his high school and college in gymnastics. For the previous year he had been an assistant coach of the O.S.U. gymnastics team. In his vita he expressed a desire to teach physical education and coach gymnastics at the high school level.

The settings in which Cooperating Teacher 1 and Intern 1 were observed were four coeducational classes (two kindergarten and two grade one) of middle class S.E.S. each containing between 22 and 28 pupils of whom 5 percent were black. Each subject taught basic movement exploration in isolation, to music, and with large balls, to one grade one and one kindergarten class, twice each week. Indoor and outdoor facilities were extensive and modern and the equipment was excellent.

Cooperating Model Teacher 2 was a 35-year-old single male who was a veteran 10 year teacher with extensive experience in both high school and elementary school as well as two years experience teaching in
another country. He was a high school tennis coach and had played
tenis competitively at the high school and college level. His
elementary physical education program emphasized fitness, gymnastics,
movement education and game skills.

Intern 2 was a 22-year-old single female who, throughout her
college program had taught all grade levels in elementary and high
school at six different schools. Her teaching grades for three field
experiences prior to the study were B-, B, and B+, and she had a G.P.A.
of 2.72. This subject represented her high school and college in
gymnastics and during the study devoted one hour each morning to
personal fitness development and coached the high school track and
field team.

The settings in which Cooperating Teacher 2 and Intern 2 were
observed were two coeducational grade two classes of middle class
S.E.S. Class sizes varied from 18 to 25 pupils of whom 5 percent were
black. Each subject taught parachute activities, scooter activities,
aerobic exercise and minor games to one of the grade two classes twice
each week. Indoor and outdoor facilities were extensive and modern and
the equipment was excellent.

Cooperating Model Teacher 3 was a 32-year-old married female who
was a veteran elementary physical education teacher of 9 years
experience. She represented her high school in gymnastics and
cheerleading and was a cheerleader at the college level. Her
elementary physical education program emphasized game skills, minor
games, track and field, gymnastics, and movement exploration with the
primary classes.
**Intern 3** was a 23-year-old single female who, throughout her college program had taught all grade levels in elementary and high school at six different schools. Her teaching grades for the three field experiences prior to the study were B+, B, and A-, and she had a G.P.A. of 2.73. This subject represented her high school and college in softball and soccer and was an assistant coach of the high school softball team during the study.

The settings in which Cooperating Teacher 3 and Intern 3 were observed were four coeducational classes (two kindergarten, one grade three, and one grade four) of middle class S.E.S. Kindergarten classes varied from 20 to 25 pupils and grades three and four varied from 26 to 32 pupils, of whom 5 percent were black in each class. The Intern taught one kindergarten class and one grade four class each week and the cooperating teacher taught the other kindergarten class and one grade three each week. The content covered by each subject included movement exploration, folk dance, track and field, floor hockey, softball and minor games. Indoor facilities were limited and restrictive while the outdoor facilities were extensive but in need of maintenance. The equipment was excellent.

**Cooperating Teacher 4** was a 33-year-old married female who was a veteran elementary physical education teacher of 10 years experience. She represented her high school and college in gymnastics. Her physical education program emphasized gymnastics, track and field, minor games, game skills and movement exploration using a station approach to teaching.
Model Teacher 4 was a 26-year-old married female who was in her second year as an Itinerant elementary physical education teacher having graduated from O.S.U. in 1982. She represented her high school in gymnastics and cheerleading and was a cheerleader at the college level. The subject's teaching content followed the program established by Cooperating Teacher 4.

Intern 4 was a 23-year-old male who throughout his college program had taught all grade levels in elementary and high school at six different schools. His teaching grades for the three field experiences were B+, B+, and B+, and he had a G.P.A. of 2.96. The subject represented his high school and college in soccer and was head coach of the O.S.U. women's soccer team for the duration of the study.

The settings in which Model Teacher 4 and Intern 4 were observed were four coeducational classes (two year fives, one year four, and one year three) of middle class S.E.S. All classes varied from 28 to 36 pupils, of whom 5 percent were black. The Intern taught one year five and one year four class each week and the model teacher taught the other year five and one year three class each week. The content covered by each subject included, minor games, relays, softball, track and field, and gross motor coordination. Indoor and outdoor facilities were extensive and modern while the equipment was excellent.

Cooperating Teacher 5 was also cooperating teacher three. Refer to page 67 for a description of the subject.

Model Teacher 5 was also model teacher four. Refer to page 69 for a description of this subject.
Intern 5 was a 24-year-old single male who, throughout his college training program, had taught all grade levels in elementary and high school at six different schools. His teaching grades for the three field experiences prior to the study were B+, B+, and A, and he had a G.P.A. of 3.10. The subject represented his high school and college in gymnastics and was an active college competitor at the time of the study.

The settings in which Model Teacher 5 and Intern 5 were observed were four coeducational classes (two grade sixes, one grade four, and one grade five) of middle class S.E.S. All classes varied from 26 to 34 pupils of whom 5 percent were black in each class. The Intern taught one grade four and one grade five each week and the model teacher taught two grade sixes each week. The content covered by each subject included track and field and softball. Facilities and equipment were the same as those for Cooperating Teacher 3; that is, indoor facilities were limited and restrictive while the outdoor facilities were extensive but in need of maintenance, and the equipment was excellent.

Cooperating Model Teacher 6 was a 40-year-old married male who was a veteran elementary and high school teacher of 18 years experience in the one school district. He represented his high school and college in baseball and had extensive experience as a coach of various high school sport teams. At the time of the study he was athletic director and co-coach of the high school baseball team. His elementary physical education program included movement exploration for kindergarten to grade two, track and field, gymnastics, game skills, major games,
relays and cooperative games.

Intern 6 was a 23-year-old single male who, throughout his college training program, had taught all grades in the elementary and high school at six different schools. His teaching grades for three field experiences prior to the study were B-, B, and B and he had a G.P.A. of 2.45. The subject was assistant coach of the high school baseball team for the duration of the study.

The settings in which cooperating model teacher six and Intern six were observed were two grade 2 coeducational classes of middle class S.E.S. The class sizes varied from 20 to 24 pupils of whom 5 percent were black. The Intern taught one grade two, twice each week and the cooperating teacher taught the other grade two twice each week. The content covered by each subject included movement education, track and field and relays. Indoor and outdoor facilities were limited and restrictive and the equipment was adequate.

Tables 3 and 4 provide a summary of some of the characteristics of the cooperating and model teachers and the Interns respectively.
TABLE 3

Characteristics of Cooperating Teachers

<table>
<thead>
<tr>
<th>Subject</th>
<th>Age</th>
<th>Sex</th>
<th>Years of Teaching Exp.</th>
<th>Sport Participation at High School and College</th>
<th>Grades Taught During Observation</th>
<th>Coaching Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>c m.1</td>
<td>26</td>
<td>F</td>
<td>4</td>
<td>Gymnastics</td>
<td>K and 1</td>
<td>Gymnastics</td>
</tr>
<tr>
<td>c m.2</td>
<td>35</td>
<td>M</td>
<td>10</td>
<td>Tennis</td>
<td>2</td>
<td>Tennis</td>
</tr>
<tr>
<td>c m.3</td>
<td>32</td>
<td>F</td>
<td>9</td>
<td>Gymnastics &amp; cheerleading</td>
<td>K and 3</td>
<td></td>
</tr>
<tr>
<td>c.4</td>
<td>33</td>
<td>F</td>
<td>10</td>
<td>Gymnastics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>m.4</td>
<td>26</td>
<td>F</td>
<td>2</td>
<td>Gymnastics &amp; cheerleading</td>
<td>5 and 3</td>
<td></td>
</tr>
<tr>
<td>c.5a</td>
<td>32</td>
<td>F</td>
<td>9</td>
<td>Gymnastics &amp; cheerleading</td>
<td></td>
<td></td>
</tr>
<tr>
<td>m.5b</td>
<td>26</td>
<td>F</td>
<td>2</td>
<td>Gymnastics &amp; cheerleading</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>c m.6</td>
<td>40</td>
<td>M</td>
<td>18</td>
<td>Baseball</td>
<td>2</td>
<td>Baseball &amp; Athletic Director</td>
</tr>
</tbody>
</table>

NOTE:  

c m = cooperating model teacher  
c = cooperating teacher  
m = model teacher  
aThis subject is also subject 3 c m  
bThis subject is also subject 4 m
<table>
<thead>
<tr>
<th>Subject</th>
<th>Age</th>
<th>Sex</th>
<th>GPA</th>
<th>Teaching Grades</th>
<th>Sport Participation at High School and College</th>
<th>Grades Taught During Observation</th>
<th>Coaching Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>23</td>
<td>M</td>
<td>3.00</td>
<td>B, B, B+</td>
<td>Gymnastics</td>
<td>K and 1</td>
<td>Gymnastics</td>
</tr>
<tr>
<td>1.2</td>
<td>22</td>
<td>F</td>
<td>2.72</td>
<td>B-, B, B+</td>
<td>Gymnastics</td>
<td>2</td>
<td>Track &amp; Field</td>
</tr>
<tr>
<td>1.3</td>
<td>23</td>
<td>F</td>
<td>2.73</td>
<td>B+, B, A-</td>
<td>Softball &amp; Soccer</td>
<td>K and 4</td>
<td>Softball</td>
</tr>
<tr>
<td>1.4</td>
<td>23</td>
<td>M</td>
<td>2.96</td>
<td>B+, B+, B+</td>
<td>Soccer</td>
<td>4 and 5</td>
<td>Soccer</td>
</tr>
<tr>
<td>1.5</td>
<td>24</td>
<td>M</td>
<td>3.10</td>
<td>B+, B+, B+</td>
<td>Gymnastics</td>
<td>4 and 5</td>
<td>--</td>
</tr>
<tr>
<td>1.6</td>
<td>23</td>
<td>M</td>
<td>2.45</td>
<td>B-, B, B</td>
<td></td>
<td>2</td>
<td>Baseball</td>
</tr>
</tbody>
</table>
Observation Instrument

It has often been stated that the best observation instrument is one which illuminates the behaviors being observed according to the purpose of the investigation. Therefore, the instrument needs to be created to fit the purpose of the experimenter, analyzer, self-evaluator or whomever else may need to collect empirical information about the behavior of an organism. This approach is preferred to attempting to use an instrument designed for another purpose. It may be that some elements of an established instrument are applicable to the new setting and therefore all that is required is a modification. For example, Birdwell (1980) modified the ALT-PE instrument so that it included the teacher behaviors that needed to be analyzed. Sledentop (1983) states, "The best observation systems are always those created for specific purposes within a local program, systems that reflect clearly the major emphasis within a teacher preparation program and are specific to the goals of any particular teaching episode." (p. 258).

In this study there was a need to identify those teaching behaviors that were not present in either the Intern or their assigned cooperating model teacher prior to intervention. It was essential to know that the dependent variables (teaching behaviors) were not already a part of the repertoire of either the Intern or their cooperating model teacher. Therefore all of the behaviors of each of the twelve teachers (Interns and models) were described and counted either using duration or event recording. This was made possible because each class was videotaped from the time the first child entered the gymnasium
until the last child left the gymnasium.

Reviews of the various observation systems used in physical education (Darst, Mancini, and Zakrajsek, 1983) and the results obtained from applications of several of these systems (Anderson and Barrette, 1978) were combined with the various characteristics of teaching behaviors which produce effective teaching (Siedentop, 1983) to provide this researcher with the ability to discriminate many of the teaching behaviors. Whenever an indiscriminate behavior occurred it was appropriately labeled and added to the comprehensive list of possible teaching behaviors.

During the first week of the ten week study two visitations were made to the classes of each of the subjects who would participate in the study as either a model or an intern. The purposes of these visitations were:

1. to familiarize the pupils and teacher with the presence and behavior of the experimenter operating a video camera in the gymnasium during the lesson; and

2. to obtain data which was analyzed to describe the total teacher behavior, according to the discriminative powers and perspectives of the experimenter, of each subject (see Appendix C for a copy of the results of these initial observations and accompanying definitions of each of the behaviors).

The data arising out of the descriptive observations made during week one were analyzed and, for each subject, four behaviors were located which fulfilled the following criteria:

1. The behaviors were not present in the performance of the subject as a teacher. Or, if they were present, they were of a frequency or duration which conflicted with what we know to be appropriate for effective teaching.

2. Teaching behaviors were selected to be included in the observation instrument only if they were lacking in both the model teacher and his/her intern.
3. If there was a choice, low inference behaviors were selected so that observer agreement and reliability problems could be minimized.

Each lesson in the study was videotaped, thus removing the limitation of possibly losing valuable data because the observers need, in live observation, to stop attending to the subject in order to record the behavior. It was, therefore, possible to use event and duration recording techniques in both the preliminary descriptive analyses and in the observation system created for the collection of data during the experimental phase of the study.

"Event recording is a frequency count of events as they occur (Hall, 1971)". Sledentop (1983, p. 252). In the observation of teaching behavior in this study event recording techniques were used to record the number of discrete instances of a behavior; for example, the instances of the analytic unit "prompt-observe-feedback". Each time the entire cycle occurred a check mark and the time in the lesson when the cycle began were recorded in their appropriate rows (see Figure 1 for a copy of the coding instrument).

Duration recording is best used when the amount of time that a teacher is involved in the behavior is important. The amount of cumulative time that a specific instance of a behavior occupies is recorded on the observation sheet. In this study voice enthusiasm required a duration recording. When the subject produced the appropriate variation in voice volume the time that he/she began the variation was recorded in the time row and check marks (✓) were placed in the "check" row. Each check mark represented five seconds of observation time. It is quite feasible to have one starting time
**Observation Recording Sheet**

Teacher ___________ Date ______ Tape No. _____ Class No. _____

Start Time _______ Finish Time _______ Lesson Duration _______

Experimental/Control _______ Phase of Study _______ Grade _____

Observer _______________ Reliability Observer _______________

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Recording</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>Time</strong></td>
</tr>
<tr>
<td></td>
<td>Check</td>
</tr>
<tr>
<td></td>
<td>Time</td>
</tr>
<tr>
<td></td>
<td>Check</td>
</tr>
<tr>
<td></td>
<td>Time</td>
</tr>
<tr>
<td></td>
<td>Check</td>
</tr>
<tr>
<td></td>
<td>Time</td>
</tr>
<tr>
<td></td>
<td>Check</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 2.       | **Time**  |
|          | Check     |
|          | Time      |
|          | Check     |
|          | Time      |
|          | Check     |
|          | Time      |
|          | Check     |

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 3.       | **Time**  |
|          | Check     |
|          | Time      |
|          | Check     |
|          | Time      |
|          | Check     |
|          | Time      |
|          | Check     |

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 4.       | **Time**  |
|          | Check     |
|          | Time      |
|          | Check     |
|          | Time      |
|          | Check     |
|          | Time      |
|          | Check     |

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Lesson Content -**

Figure 1 - Critical Teacher Behavior Observation System
accompanied by as many as 10 check marks. The five second checks began from the nearest whole second of the starting time for the appearance of the behavior.

Following the preliminary analysis the dependent variables were selected having considered: a) their neglect by the teacher and Intern; and b) the evidence (see the review of literature section on teacher effectiveness) which supports their positive impact on student achievement.

**Definitions of Teaching Behaviors**

This section includes a brief rationale for the selection of each of the eight teaching behaviors used as dependent variables in this study. The rationale accompanies a definition of the behavior which in turn is followed by examples and non-examples of the behavior.

Of the few studies conducted in physical education which investigate the relationship between teacher behavior and student achievement there has been considerable agreement that: 1) there is a lack of a significant relationship between teacher and student management time and student achievement or between teacher instruction time behaviors and student achievement (McLeish, 1981; Phillips and Carlisle, 1983; Yerg, 1981); and 2) the single most important criterion in the determination of an effective physical education teacher is the engaged skill learning time of the student (McLeish, Howe, and Jackson, 1981; Phillips and Carlisle, 1983).

In view of these findings and those presented in the review of literature, as well as the need in this study to use behaviors observed to be absent from the teacher's repertoire, the following eight
behaviors were selected:

**Vantage Point.** The teacher is in a stationary position from which the entire class can be observed for a period of no less than 45 seconds. This teaching strategy compliments the typical and effective teacher movement behavior of continual, unpredictable and systematic movement about actively engaged students. By adopting a different vantage point each time, the teacher can retain the unpredictable aspect of his/her position, view the student's performance as it impacts upon the entire class, fill out student evaluation charts, enhance "withitness" (Kounin, 1970), actively supervise or monitor without having to attend to one's position or movement interfering with the class, take time to evaluate how the lesson is progressing, and refrain from interfering with the activity.

**Specific Characteristics:** No student should be able to move out of the peripheral vision of the teacher. The position does not interrupt the flow of the activity. The teacher actively supervises or monitors the class and maintains a continuous scanning motion. Stationary means that the teacher remains within a circle of six yards diameter or within three large steps of the first adopted position. The time (45 seconds) begins from the end of an instruction to the beginning of the next instruction provided the giving of instruction stops the flow of the activity.

**Examples:**

The teacher stands in the corner of the gymnasium and continually offers concurrent praise and/or feedback to the student.

The teacher sits on a chair monitoring a group seated on the floor who are engaged in body percussion to music. The teacher may occasionally lead the exercise.

The teacher scans the class and simultaneously records on a checklist, provided the attention of the teacher is not off the class for the majority of any five second interval.
Non-Examples: The teacher is in the correct position but engages in a conversation with a student, team teacher or Intruder such that the attention of the teacher is off the students for the majority of any five second interval. Teacher continually leads the student activity (e.g. calisthenics).

Recording Techniques: The observer records the time of the lesson that the teacher initially adopted the vantage point and then places check marks in the appropriate space on the observation sheet (see Figure 1) for each successive five seconds that the teacher remains in vantage point.

Prompt-Observe-Feedback. This sequence was a reminder from the teacher about a previous instruction, immediately followed by the teacher observing the student's response(s) which was then followed by a teacher reaction (feedback). Immediate feedback is an essential component of efficient learning. Unfortunately many teachers will either provide continual instruction without any feedback or they will react to student responses with indiscriminate generic phrases like, "Good job!"; "Way to go!" and "Super!" The prompt-observe-feedback cycle has three components identified as contributing to effective teaching. Firstly, a prompt can be used to give a performer a "second chance". For example, the teacher may ask the students to line up at the gym door quietly. Some students may not have attended to the request to be quiet and subsequently are noisy. Rather than assume that the students are misbehaving and undisciplined the teacher offers a reminder about the need to be quiet. This may avoid the need for negative criticism and help to maintain a positive climate in the gymnasium.

Secondly, the teacher's close observation of the students' response, following the prompt, enhances the possibility of the stated
task being attempted (Doyle, 1979) by providing the stimulus of close observation. Close observation is usually associated in schools with being held accountable.

Thirdly, the feedback which immediately follows the observation will enhance the learning of the task and can simultaneously, depending on its nature, act as a reinforcer for the student's response.

Specific Characteristics: The prompt is a reminder. The initial instruction has occurred previously during the class or is presumed to have occurred in another class. To avoid increased interference only those prompts associated with instructions from the same lesson were recorded.

Prompts should give specific information to the students about the task. It is possible for the feedback to appear to occur concurrently with the observation. Prompts can be non-verbal teacher prompts (e.g., pointing a finger to indicate the direction of a movement) or verbal prompts. Feedback can be either positive, negative or corrective.

The entire cycle, or analytic unit, can relate to knowledge components of physical education or to activity.

Examples:  
1) Teacher, "Don't forget to line up quietly!" Students are observed tip-toeing to the gym door. Teacher, "There is no need to tip-toe!"

2) Teacher, "Keep your legs bent when you do sit-ups." Teacher, "Legs bent, John!" Student responds by bending legs. Teacher, "That's better."

Non-Examples: Any altering of the order of the three components of the cycle is a non-example. Teacher, "That's good, John! Now don't forget to keep your legs bent." The teacher instructs the students about being in motion when passing the relay baton and informs the students that she will be recording their form on a checklist. Teacher, "Now remember to be moving when you exchange the baton." The teacher then observes a pair of students and records their performance on a checklist which is posted in the gym for the students to see after the lesson.
Recording Techniques: The time of the lesson that the cycle began and a check mark are placed in their appropriate spaces on the observation sheet.

*Voice Enthusiasm.* This is either a distinct increase in the volume of the teacher's voice when delivering positive specific and/or general feedback or a distinct decrease in voice volume when the teacher is delivering knowledge about the subject matter. The review of literature (p. 50) indicates that voice inflection (change of volume and tone) contributes significantly to the attentiveness of students in classrooms (Rolider, 1979). In this study the rationale was that it would be reinforcing at the elementary level for students to know that the positive feedback, specifically directed to them, was being heard by all of their peers in the gymnasium. Also, speaking quietly while giving substantive instructions would develop the need for students to attend more closely to the instructions.

Specific Characteristics: Clapping while giving feedback with a normal voice was also counted as voice enthusiasm.

**Examples:**
1) Teacher raises her voice for comments like "Superb, Mike!"; "Way to point your toes, Ann!"; "Wow! That was terrific!"

2) Teacher lowers her voice for substantive instructions like "There are two important points to know about long jump..."; "What's the first thing to remember when we finish a game?"; "Aerobic exercise keeps your heart and lungs fit."

**Non-Examples:**
1) Teacher raises her voice for comments like "Heads up!"; "Bad luck, Ann. Keep your feet together next time"; "Stop!"; "Go!".

2) Teacher lowers her voice for the examples of feedback given above in the "examples" section. Teacher lowers her voice when giving non-substantive instructions like "We are going to divide into four teams"; "Line up on the
yellow line"; "Let's move quickly between stations".

**Recording Technique:** The time of the lesson when the enthusiastic behavior began was recorded in the space provided on the observation sheet. A check mark was recorded for every five second interval in which an enthusiastic behavior occurred.

**Objective Checklist.** A checklist containing the names of all of the student's was used to record whether the student, achieved (A), partially achieved (PA), or did not achieve (NA) the criteria for at least one specific skill during the lesson. The specific skill was the major objective of the lesson. Checklists provide a permanent record of student achievement, facilitate the formulation of student reports, and offer another medium for the teacher to give feedback. They also ensure that each child is observed at least once each lesson and increase adherence to the stated task.

**Specific Characteristics:** Teachers had the checklist in their hand. All children were to be assessed in each lesson and recordings made during the lesson. All of the teacher's attention was focused on the checklist. The teacher may have chosen to record each evaluation immediately they had observed the student or may have chosen to wait until the end of the lesson to record. It depended on the difficulty of the skill objective.

**Examples:** The teacher observes a child performing then pauses to record. Recording was evidenced by the teacher's pen marking the checklist and the teacher's vision being focused on the checklist.

**Non-Examples:** Marking the roll at the beginning of a lesson.

**Recording Techniques:** The time of the lesson when the teacher devotes his/her entire attention to the checklist was recorded in the appropriate space on the observation sheet. For each five second interval in which the teacher was marking or attending solely to the checklist a check was placed in the space provided.
Non-Descriptive Cue for a Demonstration. The teacher used a non-descriptive cue (e.g. whistle blast) as a means of bringing the students to a predetermined assembly position. The position facilitated the student's observation of a class demonstration and the cue did not require any accompanying descriptive remarks. Although there is very little research to show that this behavior produces more effective teaching, it has been observed that gymnasium routines and signals for attention can reduce the opportunity for disruptive behavior and also increase the time available to engage in activity (Siedentop, 1983).

Specific Characteristics: The cue did not include Information about the required student behavior. Demonstrations did not necessarily need to immediately follow the assembly of the children. Children did not require reminders about the meaning of the cue.

Examples: 1) Teacher blows the whistle and students move immediately to the corner of the gym and sit on the floor in a "V" formation. The teacher, or a chosen student, then gives a demonstration.

2) Teacher calls "Demol!" and the students immediately form a file in the center of the gymnasium and await the demonstration.

Non-Examples: 1) Teacher, "I want everyone to sit on that black line and face me."

2) Teacher blows the whistle and the students stop what they are doing and stand where they are to watch a demonstration.

Recording Techniques: The time of the lesson when the cue occurred was recorded in the appropriate space, on the observation sheet, as was the check mark to indicate that all components of the behavior were exhibited.

No Repeats. The teacher refrained from repeating students' answers to teacher solicitations. At the same time the teacher maintained the level of questioning necessary to fulfill the class
objectives. Repeating children's answers was replaced by either "Yes!", "Think again!", "Almost right!", variations of these responses which have the same connotation, or the repeating of the answer in a different context so that the student's response is clarified or elaborated upon. The rationale for selecting this behavior was that repeating student answers becomes boring. It also sends the "hidden message" that only certain answers are acceptable and this quickly frightens other potential contributors (Sledentop, 1983). Finally, not repeating answers places demands on the student to speak clearly so that everyone can hear the answer.

Specific Characteristics: The interaction could be substantive or non-substantive. Non-verbal responses to student's answers were recorded. The repeat could be a part of a lengthy response.

Examples:

1) As well as the above examples of teacher responses other possible responses include: a) nodding the head; b) "Good answer"; c) "That's right"; d) "Try again"; and e) "Nearly!"

2) Teacher, "Name a type of roll?"
   Student, "Forward Roll."
   Teacher, "Good! A forward roll is one of the easiest rolls to do."

Non-Examples:

1) Teacher, "What's your name?"
   Student, "John."
   Teacher, "John."

2) Teacher, "Name a type of roll?"
   Student, "A forward Roll."
   Teacher, "A forward roll, good! A forward roll is one of the easiest rolls to do."

Recording Techniques: For every example and non-example of not repeating answers the time of the lesson is placed in the appropriate observation sheet space. A check mark is recorded for each instance of an example and a cross (X) was recorded for each non-example. Acknowledgments like, "O.K." and silence by the teacher were not recorded.
Selective Attention Demonstrations. Prior to giving a demonstration the teacher verbally previewed the most important aspects of the movement. Two of these aspects were given special attention and the students were told to selectively attend to those two aspects during the practical demonstration. The demonstration immediately followed the verbal description and all of the students were given the opportunity to attempt the movement as soon as possible following the demonstration. Therefore, three components were essential to this behavior: verbal highlighting of two aspects of the movement; an accurate demonstration; and the opportunity for students to practice.

The power of the model is undeniable (Stephens, 1977). This teacher behavior ensures that the students can discriminate those cues in the model which enhance appropriate performance. It also provides practice of the behavior before its essential elements have been forgotten. The limitation of highlighting only two components reduces the time taken for the demonstration, allows more time for practice, reduces the complexity of the task, and therefore, increases the possibility of a successful performance.

Examples: 1) Teacher, "When adopting the 'ready' position for the sprint start you should make a bridge with your thumb and first finger and place your front foot next to your rear leg knee. Watch me do that...Now everybody practice those two components of the ready position."

Non-Examples: 1) The order of presentation of the three elements of the behavior was changed.

2) The verbal cueing occurs concurrently with the demonstration.

3) Not all students were given the opportunity to practice.
4) Several demonstrations of different skills were given before students were allowed to practice any of them.

Recording Techniques: The time of the lesson was recorded when the teacher began verbal instruction. A check mark was recorded when all three elements were present and in the correct order of presentation.

Positive Interaction With a Misbehavior Cue. Siedentop (1983) defines a "positive interaction with a misbehavior cue" as being to "emit a positive interaction with a student when another student behaves in some inappropriate manner" (p. 97). Teaching research not only indicates that effective teachers produce academic growth but also that effective teachers do so in a warm, nurturant educational climate (Sawar and Sawar, 1979). Teachers who use positive interactions with or without a misbehavior cue are essentially promoting a positive style and therefore supporting a warm, nurturant climate.

Specific Characteristics: It was often given with the intention of either changing the behavior of those other than the target student or as a reminder of appropriate behavior. It was either substantive or non-substantive. Typically it begins with "I like the way that..." The behavior was most often a disguised prompt and rarely was it feedback following an instruction.

Example: 1) The teacher asks students to line up at the door. A few children are noticed dawdling. The teacher says, "I like the way Andrew lined up quickly. Thank you, Andrew."

2) A demonstration has just been given on how to dribble the basketball at waist height. One student (Bill) decides to bounce the ball as high as he can. Teacher says, "John is bouncing the ball perfectly at waist height. John you will be able to play in the game later in the lesson."

Non-Examples: 1) Although this behavior is also appropriate when there is no misbehavior for this study, it was limited to only those situations where misbehavior was present in someone other than the
student who was targeted for the positive interaction. However, because the video rarely captured more than 50 percent of the students in the class it was assumed that a misbehavior was the cue for the teacher behavior. A non-example would be situations where there wasn't a misbehavior.

2) The praise was non-specific.
3) Only the target student heard the praise.

Recording Techniques: The time of the lesson was recorded at the beginning of the behavior. A check mark was recorded for each instance of the behavior.

All of the eight teaching behaviors which were used as the dependent variables and which are described above in detail were independent occurrences. At no stage did the recording of one of the behaviors necessitate the recording of another. However, it was often observed that behaviors could occur concurrently. Teachers would occasionally produce a "prompt-observe-feedback" cycle while actively supervising from a "vantage point". A response to a student's answer was often accompanied by praise in the form of "voice enthusiasm". "Voice enthusiasm" was also observed to periodically accompany "positive interactions with a misbehavior cue". The instruction element of "selective attention demonstrations" was sometimes delivered with a lowering of voice volume, therefore, warranting recording as a "voice enthusiasm". The checklist, as adopted in this study, was also regarded as active supervision provided the teacher did not attend to the checklist continuously for more than five seconds. If the attention to the checklist exceeded five seconds in any single recording while the teacher was adopting a vantage position, then the 45 second interval for vantage point was restarted from the time the
teacher's attention returned to the class activity.

Description and Training of Observers

Five individuals collected data for this study. Observer 1 was the experimenter. His role was to videotape lessons in the gymnasiums, observe and record teacher behaviors from the videotapes, and act as a reliability judge for two of the other four observers. Observer 2 was an elementary teacher who had no previous experience with observational recording. Her role was to observe and record teacher behavior from the videotapes, and serve as a reliability judge for observer 1. Observer 3 was a graduate student from O.S.U. with ten years teaching experience in the elementary school and an undergraduate major in physical education. She was the wife of the experimenter and had previous experience with observation recording in reading research. Her role was to observe and record teacher behavior from the videotapes and serve as a reliability judge for observer 1. Observer 4 was a graduate student in physical education who had extensive previous experience videotaping in live settings. His role was to videotape lessons in the gymnasium. Observer 5 was a graduate student in physical education, teacher education, who had previous experience in observational recording from videotape. His role was to videotape lessons in the gymnasium.

Observers 4 and 5 were only involved in videotaping in the live setting. Their decision to be involved was the result of a flyer being sent to each of the graduates in the physical education teacher education department. The flyer (see Appendix C) indicated the times that assistance was needed. Observer 4 chose the Wednesday mornings obser-
vation session and observer 5 chose to videotape on Fridays from 10:30 a.m. to 2:00 p.m. This commitment by observers four and five freed the experimenter to adopt his role as a supervisor at the high school.

Both observers were familiar with the operation of a camera and, therefore, the time needed for training was reduced. During the second week of the study the experimenter provided a 90 minute training session for these observers at the site of their future observations. The major purpose of the training was to ensure that the teacher was the focus of the videotape at all times.

Observes 2 and 3 were volunteers who showed an interest in the study. The following describes the steps used during the training of observers.

1. Week One Involved a pre-study analysis by the experimenter (see Appendix D). Arising out of an informal but comprehensive analyses of two lessons for each model teacher and Intern were the broad definitions of the eight teaching behaviors to be used in the study. At the end of this week, and before Week Two, observers 1, 2 and 3 viewed the initial tapes for each teacher and together made decisions which refined the definition of each behavior until it was regarded by each of the observers to be representative of the overt behavior being observed (see the section on Definition of Teacher Behaviors p. 78). The experimenter insisted on consensus before any component of the definitions was accepted. Observer accuracy was high. Both observers 2 and 3 agreed with the pre-coded standard obtained by the experimenter (Observer 1).

Because the behaviors were chosen for their significant absence
most of the initial decisions were based on non-examples. It was possible, however, to locate a few examples of all the behaviors (dependent variables) other than the "objective checklist" and the "non-descriptive cue for a demonstration". This was done by observing all eight behaviors in each model teacher rather than just the four chosen to be the target behaviors.

In an effort to provide examples of each of the behaviors the experimenter was videotaped conducting two model lessons in which examples of all of the behaviors were included. These tapes were used to assist in the training of observers and model teachers. Unfortunately, these examples were not representative of how the behaviors were to manifest themselves in the model teachers and it was therefore decided to include a booster training session for the observers immediately following the intervention of a new behavior during the study.

2. The observers were given a copy of the "behavior change manual" (see Appendix E) which contained the guidelines for the cooperating and model teachers. Among those guidelines were the behavioral definitions of the dependent variables. Each observer was given three days to familiarize themselves with the contents of the manual.

3. Observers were provided with written descriptions of examples and non-examples and were asked to write beside the examples which teacher behavior they represented. For non-examples they were instructed to put a cross. Criterion for acceptance was 27 out of 30 correct. Both observers 2 and 3 achieved criterion on their first
attempt. Observer 1 devised the test (see Appendix F).

4. Observers began practice of coding using the tapes obtained from the second week of observation (first week of the baseline phase). Observers were encouraged to view a 10 minute segment of each of the model teachers and interns to familiarize themselves with the idiosyncratic manifestations of each teaching behavior. The three observers then coded the same tape independently for ten minutes and the results were compared and discussed. This was the first attempt at obtaining inter-observer agreement.

5. When the observers indicated they were comfortable with the observation sheet (see Figure 1, p. 77), they proceeded to code three entire lessons which together contained examples of each behavior. It was inappropriate using this observation system for observers to code the same tape at the same time because it was necessary to stop the tape to record the time of the lesson that a behavior occurred. Also, because the entire study was to be videotaped, the observers did not need to be able to code a!continuous performance. An inter-observer reliability of above 80 percent was achieved by the three observers when each of them was checked against the other two observers.

6. Throughout the first five steps in the training program a decision log was maintained to assist with the continual refinement of definitions and accuracy of coding (see Appendix G).

Training was completed when the observers achieved the 80 percent reliability criterion. This occurred during the third week of the study (second week of the baseline phase).
Reliability

The method advocated as appropriate for obtaining reliability using event or duration recording is to divide the larger sum into the smaller sum (Hersen and Barlow, 1982). The problem with this type of reliability measure is that although the independent observers have relative agreement for the number of events or the total duration of an event they may not agree on the same events. The possibility of this situation occurring is greater if the frequencies of the behaviors being observed are high. To overcome this problem, and at the same time provide a more rigorous confirmation of observer accuracy and reliability, the time that each target behavior began was also recorded. Reliability was computed using the formula:

\[
\frac{\text{number of agreements}}{\text{number of agreements and number of disagreements}} \times 100
\]

Agreements were those events for which both observers recorded the same time plus or minus two seconds. Two seconds was chosen because few behaviors lasted for a time less than two seconds. Also, by using an overall four second segment one could be confident that the observers are scoring the same events at the same time (Bijou, Peterson, Harris, Allen and Johnston, 1969). Disagreements were noted as those recordings of either observer which were not scored at the same time of the lesson. Agreement of the number of non-occurrences of a behavior was not included in the analysis. In some instances this caused reliability problems when the frequency of occurrences was low for a behavior monitored over a long period of time. This problem is attended to in Chapter Four, discussion of reliability.

In this study reliability was scored for each of the dependent
variables, in every phase of the study, for each model teacher and intern. The results of the reliability checks for the observations within the study are reported in Chapter Four.

To ensure that acceptable levels of agreement were possible throughout the study, subsequent to training, the following precautions were included in the observation procedure.

1. **Task Mastery:** Observers were not permitted to begin coding the videotapes until they had achieved 80 percent reliability with an expert coder on at least two occasions (Hersen and Barlow, 1982).

2. **Random Selection of Tapes:** In this study the use of video permitted the experimenter's (Observer 1) observation of all of the recorded lessons, either as an observer or as a reliability judge. Observers 2 and 3, due to time constraints, were restricted to either observing or checking (reliability) one lesson for each of six of the twelve subjects each week. Observer 1 coded 24 lessons each week and observers 2 and 3 each randomly selected six of these tapes to code for reliability. On those occasions, Weeks 8, 9 and 10, when observer 3 was available to code before observer 1 had viewed the tapes, observer 1 acted as a reliability judge for each of the tapes coded by observer 3. This procedure ensured that observer 1 was being continually monitored.

3. **Observer Bias:** Hersen and Barlow (1982) warn about the unintentional and intentional errors committed by observers, "Consider the situation where the observer not only records the data but also performs experimental manipulations. Under these conditions, there can be little doubt that a strong possibility for bias is present, particularly as most experimenters communicate (directly or indirectly) their expectations and hypotheses to their research assistance. . . . It would appear that the use of audio and videotaped recordings, presented to observers in randomized sequence, represents an ideal method to prevent the intrusion of biasing factors in the observational and recording process" (p. 129).

In this study the experimenter was also an observer and as mentioned above the viewing of videotapes was randomized. To avoid possible observer bias in observers 2 and 3 the experimenter did not inform them about which phase of the
study was being represented by the tape they were coding at any particular time. Also, spot checks of reliability were randomly sequenced such that all three observers coded the same lesson.

4. **Observation setting:** The observers were scheduled to observe at the same venue and time using standard equipment for each observation session. This was done to reduce possible environmental interference during the coding of tapes.

5. **"Booster" Training Sessions:** Each time an intervention affected the appearance of a new or modified behavior in a subject's repertoire the observers received a brief retraining session which consisted of viewing instances of the new behavior as well as reviewing behaviors that had caused problems in previous reliability checks.

6. **Decision Log:** During the "booster" sessions any decisions to alter the definitions of behaviors or the procedures for recording behaviors were included in the decision log (see Appendix G).

### Intervention and Design of the Study

Many studies have investigated the effects of teacher process and pressage variables on the student product, achievement in both the classroom and, more recently, the gymnasium. The concept of ALT-PE (a process variable) has provided one of the few measurable predictors of teaching outcomes. It is an essential link between teacher behavior and student performance which has fostered the confidence to operationally define what constitutes effective teaching behavior.

How a teacher acquires the most effective teaching behaviors in physical education has been a concern of research at O.S.U. for the past decade. Typically it was found that, while it was possible to change the behaviors of interns and experienced teachers (Sledentop, 1981), the cost in time and effort tempered an enthusiastic commitment to a universal application of any one method in teacher education (Hutsler, 1977).
**Intervention:** The intervention in this study was an attempt to investigate a technique which maintained or improved the existing methods for changing an intern's teaching behavior while simultaneously limiting the demands made of university supervisors and cooperating teachers. The technique was modeling.

Interventions of written and oral feedback and written and oral suggestions are typically employed by cooperating teachers and supervisors to alter the behavior of training interns in the practical setting. This, therefore, was one of the interventions used in this study. It was called "standard intern training" and consisted of the following:

1. The cooperating teachers conferenced with their intern at the same time on the same day each week a) to discuss the previous week's performance and b) for the cooperating teacher to ask the intern to improve three teaching behaviors, one of which was a target behavior given to the cooperating teacher by the experimenter. The target behaviors were contained in the "behavior change module" (see Appendix E) given to the cooperating teachers by the experimenter.

2. Criterion levels were established for each behavior the intern was expected to display.

3. Between conferences the cooperating teacher observed and coded the intern's performance of the three behaviors. The observation of the intern's teaching was scheduled to occur during the lessons that were being videotaped by the experimenter.

4. Prior to the intern's teaching of an observed lesson the intern was required by the cooperating teacher to attend to the teaching of a model teacher, preferably sometime during the same day. The model teacher did not use the target behavior.

5. Written (cooperating teacher's observation sheet) and oral feedback were given to the intern immediately following their observed lesson. The feedback regarding the target behavior was neither positive or negative. It merely indicated the achievement or non-achievement of the criterion. For example, the cooperating teacher said, "You achieved two
vantage points and the criterion is three for vantage point mastery."

Figure 2 is a summary of the sequence of events involved in the implementation of this intervention.
Intervention A: Day 1 -- Intern cooperating teacher conference

Day 2 -- Normal day

Day 3 -- Intern observes a model teacher
  Intern teaches a lesson (cooperating teacher observes)
  Cooperating teacher gives feedback

Day 4 -- Normal day

Day 5 -- Intern observes a model teacher
  Intern teaches a lesson (cooperating teacher observes)
  Cooperating teacher gives feedback

Figure 2. Intervention "A" Strategy -- Standard Intern Training
The intervention strategy used to investigate the effects of modeling (Intervention B) and to compare those effects with the changes effected by "standard intern training" (Intervention A) was identical to Intervention A (see Figure 2) except that: a) the model teacher did model the criterion level, or better, of the target behavior on Day 3; and b) the intern was told by the cooperating teacher to observe and code the three teaching behaviors as they occurred during the model teacher's lesson.

It was essential to the control of the interventions that the cooperating teachers and interns maintained accurate recordings of the lessons they observed. A mechanism was needed which held the intern and cooperating teacher accountable for this task. Because the experimenter videotaped in each school at least once per week it was his responsibility to collect the intern and cooperating teacher coding sheets as well as copies of any written suggestions that the cooperating teacher gave to the intern. These items were returned to each subject on the same day before the experimenter left the school.

**Design:** The design used to study the effects of Interventions A and B on the dependent variables (teacher behaviors of the interns) was a multiple baseline across behaviors design. Baer, Wolf and Risley (1968) point out that,

"In the multiple-baseline technique a number of responses are identified and measured over time to provide baselines against which changes can be evaluated. With these baselines established, the experimenter then applies an experimental variable to one of the behaviors, produces a change in it, and perhaps notes little or no change in the other baseline." (p. 94)

Subsequently, the experimental (independent) variables, Interventions A and B in this study, were applied to a second behavior and the
rate of change in that behavior was noted. This procedure was continued in sequence until experimental variables had been applied to all of the target behaviors under study.

To begin to establish confidence in the possible generalization of the findings to other settings and subjects the single-case comparison of the model intervention (Intervention B) with "standard teacher training" (Intervention A) was systematically replicated three times. The three Interns, 1, 2, and 3, (see Table 4, p. 74) who received Intervention B were called the experimental group. Interns 4, 5, and 6 (see Table 4) were the control group. These subjects were randomly assigned to the experimental or control group.

Figure 3, "Subject Roles", is a representation of the roles of each of the subjects in the study.

![Figure 3. Subject Roles]
Essentially the overall design prototype was a modification of the pre-test (pre-observation)/post-test (post-observation) control group design (Campbell, and Stanley, 1963) depicted in Figure 4.

\[
\begin{align*}
R_0 & \quad X_1 \quad 02 \\
R_0 & \quad X_2 \quad 04 \\
R_5 & \quad X_3 \quad 06 \\
\end{align*}
\]

**KEY:**
- \(X_1\) = Intervention B
- \(X_2\) = Intervention A
- \(X_3\) = Intervention B without written suggestions and feedback.

*Figure 4. Design Prototype*

Some of the true-experimental qualities (Campbell, and Stanley, 1963) were lost when the experimenter needed to include a second type of control group due to the restrictions of the natural setting. However, throughout the study the experimenter was able to randomize the exposure of subjects to treatments and on most occasions control the scheduling of experimental stimuli.

Natural contingencies operating in the control schools necessitated systematic adjustments to the original format. It was intended to have each of the cooperating teachers act as the model teacher. This was the case with each of the experimental interventions. However, control interventions required the following adjustments (refer to Figure 3):

1. Intern 4 (I4) could not be at the elementary school when his cooperating teacher (C4) was teaching owing to the intern's teaching commitments at the high school coinciding with the cooperating teacher's classes. Therefore, the itinerant physical education teacher (M4) was the model teacher for Intern 4.

2. Cooperating Model Teacher 3 (Cm 3) was assigned two of the interns, 13 and 15. Because one of these interns (I3) was
randomly selected to be in the experimental group and the other (15) in the control group then another teacher was needed to be a control model. This was to avoid Cooperating Teacher 3 from having to act as an experimental and control model teacher. Cooperating Model teacher 3, therefore, was also cooperating teacher 5 (c5) while the Itinerant physical education teacher (m4) also served as model teacher 5 (m5) for Intern 5.

Both adjustments contributed to the control of possible extraneous variables. The use of the same cooperating teacher (c m3 and c5) for the delivery of suggestions and feedback in two separate experimental conditions reduced the variability which could occur if two different teachers conferred with the Interns (13 and 15). Having the same model teacher (m4 and m5) for two Interns (14 and 15) in different settings provided control of the variability emanating from the use of two different model teachers in the control conditions. It also allowed comparisons to be made between the relative impact of the same model teacher on different Interns in different settings compared to the impact of different model teachers.

**Criteria:** Glaser and Klaus (1962) in a paper entitled, "Proficiency Measurement: Assessing Human Performance", conclude by saying,

"There is a substantial need for further development of proficiency instruments which will assess performance, not in terms of how an individual compares with other individuals but with respect to how adequately he has attained the level of competence required for system operation." (p. 473).

The level of competence required for system operation in physical education teaching would be the rate, frequency and/or duration of teaching behaviors which results in the greatest student achievement. Unfortunately the teaching task is decidedly complex and dependent upon the many idiosyncrasies of constantly changing schools, gymnasiums and
students. "The fact is that no model of an ideal or effective teacher has yet been developed, except in very general terms." (Sledentop, 1983, p. 189).

The decision, therefore, to establish a specific performance criterion for each dependent variable in this study was based on: a) the need to have something against which to measure the intern's progress; and b) the limited knowledge pertaining to what levels of effective teaching behaviors produce the greatest student achievement. Failing the availability of research supported criteria for many teaching behaviors the experimenter used his knowledge of elementary physical education teaching and the settings in which the study was conducted to set criterion levels. The following is a list of each of the behaviors (see Definitions of Teaching Behaviors p. 78) and their assigned criterion which each of the interns and model teachers were required to achieve.

1. **Three or more** "selective attention demonstrations".
2. **Three to five** "vantage points".
3. **Three or more** "non-descriptive cues for a demonstration".
4. The ratio of recommended responses for student's answers to repeating student's answers should be **greater than 50%**.
5. Observe and record on a checklist the performance of **each child** on **one or two** task related objectives.
6. **Forty or more** (number of five second intervals) "voice enthusiasms" each lesson.
7. **Ten or more** "prompt-observe-feedback" cycles.
8. **Five to ten** "positive interactions without a misbehavior cue".

Some of these criteria underscore the levels advocated as
appropriate by the current research. For example, this study required three demonstrations per class while Anderson and Barrette, (1978), indicated that six demonstrations per class were insufficient and Pieron, (1982), found that master teachers use more demonstrations. One of the objectives of the experimenter, however, in his role as supervisor, was to set criteria that could be readily achieved so that the Intern's "approach tendencies" to teaching would be maintained or increased. Therefore, criterion levels were established which were well below those expected of master teachers. Also, consideration of the Impact of the Intern having to apply 12 new behaviors to the gymnasium in only four weeks effected the setting of criteria levels.

**Training of Cooperating Model Teachers**

In physical education there have been few studies that have investigated the most effective means of changing a cooperating teacher's teaching behavior. Hutslar (1977) and Cramer (1977) investigated the effects of a five week training program on the methods of Intern supervision employed by cooperating teachers to change Intern teaching behavior. However, the changes in the cooperating teacher's teaching was not analyzed. O'Sullivan (1983) found very little change in the teaching behavior of experienced teachers following an Inservice program using conferences, videotape replays, and specific feedback as independent variables.

Time constraints did not permit the inclusion of a five week training program in this study. Therefore, the training of cooperating model teachers and model teachers was limited to the following steps.
1. Each Cooperating and Model teacher met with the experimenter the week before the study to discuss the "behavior change module" (see Appendix E).

2. Following the pre-study week of teaching behavior analysis, the experimenter met with each teacher in the experimental group to view the prepared model videotapes which contained examples of the dependent variables.

3. The experimenter arranged a time to conference with each of the three experimental teachers. The arranged conference included: a) feedback regarding the teacher's modeling of the target behavior; b) viewing the most recent Cooperating Model teacher's model lesson to discuss the inclusion of the next target behavior; and c) evaluation of the fulfillment of the various components of the intervention strategy.

4. Step 3 c) was also included in the training of the Cooperating and Model teachers in the control group.

5. Steps 3 and 4 were modified according to the needs of the experimenter in view of the ability of the teachers to fulfill the requirements for the "behavior change module".

**Methods of Data Analysis**

"Clinical and experimental criteria have been posed for evaluating applied behavior research (Risley, 1970)" (Hersen and Barlow, 1982, p. 266). Clinical "significance" is reported when the change in behavior, due to a treatment, results in adequate functioning within the society which establishes the acceptable criteria for that behavior. In this study levels of acceptable teaching performance have been established. The achievement of these levels, given the existence of previously acknowledged deficiencies, would support the conclusion that a clinically "significant" change occurred.

Aside from clinical or therapeutic criterion for evaluating an intervention, there is experimental criterion. This simply involves a comparison between the dimensions of a behavior during or following an intervention and the dimensions of the same behavior without an
Intervention. In this study comparisons were made between the relative effects of an experimental intervention and a control intervention on the teaching behavior of interns.

Clinical criterion refers to the importance of change, whereas experimental criterion refers to the reliability of the change.

Rather than embark on a lengthy discussion of the relative merits of statistical analyses and visual inspection, suffice to say that the analysis in this study intended to minimize obfuscation of performance and emphasize clinical significance.

The multiple baseline, criterion referenced, across behaviors design used in this study is essentially a time series design amenable to certain procedures of data analysis; for example, time series analysis, Revesky's (1967) $R_n$ statistical test, randomized tests and the split middle method of trend analysis (Hersen and Barlow, 1982). Each of these methods have their limitations, some of which caused their necessary exclusion as possible adjuncts to the visual inspection used in this investigation.

The multiple baseline design, although not as strong as the withdrawal design in revealing a causal relationship, effectively demonstrates changes in behavior following the sequential application of the intervention strategy, and it fosters the simultaneous measurement of several concurrent target behaviors.

The multiple baseline was preferred over a reversal design for this type of applied behavioral research because it indicated causality without requiring a reversal phase which may have negated important gains or trends in student teacher behavior changes which occurred in
the desired direction. The multiple baseline design was also selected in preference to the changing criterion design because "at this time there is insufficient research evidence upon which to base specification of the successive amounts of the treatment variables employed" (Dodds, 1975, p. 170).

Raw scores, in this study, were converted to rate measures, the number of instances of the target behavior in a 30 minute lesson. Because the lessons varied in duration from an atypical 9 minutes 29 seconds to 48 minutes 22 seconds, it was necessary to standardize the scores so that comparisons between lessons, phases, subjects and groups was possible. The 30 minute standard was evolved from the mean duration of the 194 timed lessons (mean duration = 29 minutes 59 seconds).

Instances of each of the behaviors including "vantage point", "prompt-observe-feedback", "voice enthusiasm", "objective checklist", "non-descriptive cue for a demonstration", "positive interaction without a misbehavior cue", and "selective attention demonstrations" were plotted graphically as the "number of instances/30 minutes". For the behavior, "percent of no repeats", the ratio of the number of no repeats/30 minutes to the number of repeats/30 minutes was converted to a percentage. When the number of "no repeats" was zero, a percentage of "0" was recorded. Conversely, when the number of "repeats" was "0", and there were some recorded "no repeats", the percentage of "100" was tabulated.

Comparisons between baseline and intervention phases and between the models and their respective interns were possible using visual
Inspection of multiple baseline graphs (Baer, Wolf and Risely, 1968). Differences between the mean scores of the behavior in different phases were established as were the mean scores of baseline and intervention phases and the scores for each data point. All of these measures were considered in a comparison of; the model teacher with their intern, model teachers with themselves between phases, and interns with themselves between phases and with other interns. All comparisons were conducted using visual inspection of the graphs in conjunction with the other descriptive statistics.

Points of interest included the magnitude of the change between baseline and intervention, the presence or absence of drift or slope within a phase, and change in trend between or among phases. Such an analysis revealed the magnitude, rate, and maintenance of change in teaching behavior.

The final, and most difficult, analysis was to apply all of the above findings to a comparison between the control and experimental interns. Unfortunately the differences in the characteristics of the dependent variables limited the validity of formulating overall conclusions about the relative effects of the two treatments (interventions). In those instances where the target behaviors were the same for the control and experimental groups (e.g. "objective checklist", "voice enthusiasm", "non-descriptive cue for demonstration", and "percent of no repeats") the descriptive statistics presented above (graphs, rates, means and differences) provided the basis for the analysis. Differences in the other four of the target behaviors between the experimental and control groups limited the analysis of
data to a visual inspection of the degree of similarity between the teacher and intern in one group compared to the other.

It was assumed throughout the analysis of data that the target behaviors were independent. The assumption was supported by the findings.

Summary

This chapter provided a detailed presentation of the methods and procedures employed in this study. It began with descriptions of the subjects and settings. Characteristics of the subjects were included which would firstly provide possible explanations for the degree of imitation of the model teacher by the intern (Stephens, 1977) and secondly, enrich the discussion of the generalization of findings to other subjects and settings. A rationale for and explanation of the observation instrument preceded the definition of each of the eight teacher behaviors, used as dependent variables, which were the focus of the observation instrument. Examples, non-examples and recording techniques were included in the discussion of each teacher behavior. Following the definitions was a section containing the description and training of the observers who assisted with data collection and the establishment of reliability. The next section dealt with the intervention strategy and design of the study. Both the intervention and design were chosen because of their compatibility with the purpose, limitations and format (N=1) of the study. A human element (Cooperating teacher) in the intervention, other than the experimenter, necessitated the implementation of a training program for the teachers in study. This reduced the error component in the application of the
Intervention and was included in a section entitled, "Training of Cooperating Model Teacher". The final section was devoted to a brief discussion of data analysis. It was reported that the data was analyzed using; the visual inspection of a multiple-baseline graph, means, differences between means, and raw data presented as the number of instances/30 minutes.

Chapter Four includes the tabular and graphical presentations and their accompanying texts which facilitate the analysis and discussion of data.
CHAPTER FOUR

ANALYSIS AND DISCUSSION OF THE DATA

This chapter first addresses the results of the reliability checks of the observers used in this study. Then it reports and discusses the effects of the intervention strategies on the teaching behavior of the practicing interns.

Results are presented in tables containing raw scores, and differences between mean scores in the baseline and intervention phases of the study. Multiple baseline graphs are used to allow visual inspection of the data and to highlight changes in the individual teaching behaviors between and within each phase of the study. The three replications of the experimental conditions (Intervention B) and the three replications of the control conditions (Intervention A) provide the data to investigate each of the four research questions. The discussion of the results is guided by the research questions posed in Chapter One.

Reliability

Upon completion of the training program (see Chapter three for an outline of the program) all three observers were competent recorders of the target behaviors. The observer agreement on unambiguous examples presented on video and as written examples and non-examples was above the criterion of 90 percent at the end of training. An agreement of 80 percent or more was obtained for examples of lessons which were taped in the field during the pre-study investigation.

Frick and Semmel (1978) argue that the criterion-related agreement on unambiguous videotaped examples should be at least .80 while the
agreement expected on videotapes representative of actual classrooms should exceed .75. Siedentop (1981), in regard to interobserver agreement advocates that 80 percent should be the minimum acceptable level for observer agreement on data collected in the field.

The concerns for the experimenter were: a) to control the possible bias assumed to be naturally occurring when the experimenter is also an observer; b) to monitor and prevent observer skill deterioration which typically occurs in studies of long duration (Johnson and Bolstad, 1973); and c) to ensure that interobserver agreement reflected high agreement with the original definitions of the target behaviors. To cope with these concerns the following strategies were employed:

1. Observers two and three randomly selected the tapes they would code each week so that the experimenter (Observer 1) could not manipulate consciously or unconsciously which tapes were used to check reliability.

2. The experimenter was considered an expert coder having over 80 hours of previous coding experience and also being the one who operationalized the target behaviors. Therefore it was possible to establish criterion-related agreement. "Such an agreement measure is more useful than an interobserver agreement measure when decisions about the adequacy of individual observer skills are central" (Frick and Semmel, 1978, p. 161).

3. Retraining sessions were scheduled to assist with the discrimination of previously unencountered ambiguous manifestations of a target behavior which occurred during the study.
4. Observer drift was controlled by scheduling all the observers to code an identical lesson on several occasions throughout the study.

5. All the data were collected on videotape so that errors in observation, evidenced in poor reliability scores, could be reviewed to establish accuracy in the data.

Table 5 contains the interobserver agreements and reliability (Frick and Semmel, 1978) scores for each target behavior in each phase of the study for each model teacher and intern. From this table there are certain features warranting explanation. Reliabilities were calculated by using the same units as were used for the data analysis then converting them to a percentage using the formula:

\[
\frac{\text{numbers of agreements}}{\text{numbers of agreements and numbers of disagreements}} \times 100
\]

In this study nominal agreements were reported. Nominal agreements are when the observers agree on every specific event in terms of its frequency and time of occurrence (Frick and Semmel, 1978). This is similar to scored-interval agreement whereby agreements are based on agreement regarding the time interval in which the behavior occurred in a continuous recording system.

There were 134 occasions when no instances of a behavior were observed by either observer. Rather than leave a space a 100 percent agreement was entered in the table and denoted by a "-". That is, the observers agreed that no target event occurred. When these agreements were not included in the calculation, 75.3 percent of the 182 remaining reliability scores were above the acceptable level of 80 percent agreement. The inclusion of the "no event" agreements in the calculation meant that 85.8 percent of the 316 reliability scores were
### TABLE 3

Reliability Measures for the Observation of Teaching Behaviors

<table>
<thead>
<tr>
<th>Behavior Categories</th>
<th>Subject</th>
<th>Phase of Study</th>
<th>Intervention 1</th>
<th>Intervention 2</th>
<th>Intervention 3</th>
<th>Intervention 4</th>
<th>Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vantage Point</td>
<td>CH 1</td>
<td>Baseline</td>
<td>100 (100)</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
</tr>
<tr>
<td></td>
<td>I 1</td>
<td></td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
</tr>
<tr>
<td></td>
<td>CH 2</td>
<td></td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
</tr>
<tr>
<td></td>
<td>I 2</td>
<td></td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
</tr>
<tr>
<td>Prompt</td>
<td>CH 1</td>
<td></td>
<td>(100)</td>
<td>(100)</td>
<td>(100)</td>
<td>(100)</td>
<td>(100)</td>
</tr>
<tr>
<td></td>
<td>I 1</td>
<td></td>
<td>(100)</td>
<td>(100)</td>
<td>(100)</td>
<td>(100)</td>
<td>(100)</td>
</tr>
<tr>
<td></td>
<td>CH 2</td>
<td></td>
<td>(60/83 b)</td>
<td>(60/83 b)</td>
<td>(100/100 b)</td>
<td>(100/100 b)</td>
<td>(100/100 b)</td>
</tr>
<tr>
<td></td>
<td>I 2</td>
<td></td>
<td>(60)</td>
<td>(60)</td>
<td>(60)</td>
<td>(60)</td>
<td>(60)</td>
</tr>
<tr>
<td>Voice</td>
<td>CH 1</td>
<td></td>
<td>(80)</td>
<td>100/-100 b-</td>
<td>74</td>
<td>86</td>
<td>87</td>
</tr>
<tr>
<td></td>
<td>I 1</td>
<td></td>
<td>(80/100 b)</td>
<td>81</td>
<td>74</td>
<td>86</td>
<td>91</td>
</tr>
<tr>
<td></td>
<td>CH 2</td>
<td></td>
<td>(70/90 b)</td>
<td>(80/71 b)</td>
<td>(74)</td>
<td>77</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td>I 2</td>
<td></td>
<td>78</td>
<td>80</td>
<td>90/84</td>
<td>91</td>
<td>91</td>
</tr>
<tr>
<td></td>
<td>CH 3</td>
<td></td>
<td>(72)</td>
<td>81</td>
<td>80</td>
<td>91</td>
<td>91</td>
</tr>
<tr>
<td></td>
<td>I 3</td>
<td></td>
<td>80</td>
<td>81</td>
<td>81</td>
<td>91</td>
<td>94</td>
</tr>
<tr>
<td></td>
<td>M 5</td>
<td></td>
<td>77</td>
<td>81</td>
<td>81</td>
<td>91</td>
<td>94</td>
</tr>
<tr>
<td></td>
<td>I 5</td>
<td></td>
<td>77</td>
<td>81</td>
<td>81</td>
<td>91</td>
<td>94</td>
</tr>
<tr>
<td>Checklist</td>
<td>CH 1</td>
<td></td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>99</td>
</tr>
<tr>
<td></td>
<td>I 1</td>
<td></td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>CH 2</td>
<td></td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>I 2</td>
<td></td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>94</td>
<td>94</td>
</tr>
<tr>
<td></td>
<td>CH 3</td>
<td></td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>I 3</td>
<td></td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>95</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>CH 4</td>
<td></td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>I 4</td>
<td></td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>98</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>M 5</td>
<td></td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>I 5</td>
<td></td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>95</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>CH 6</td>
<td></td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>84</td>
<td>84</td>
</tr>
<tr>
<td></td>
<td>I 6</td>
<td></td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>82</td>
<td>82</td>
</tr>
<tr>
<td>Non-Descriptive</td>
<td>CH 3</td>
<td></td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>99</td>
<td>99</td>
</tr>
<tr>
<td>Cue for</td>
<td>I 3</td>
<td></td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100</td>
</tr>
<tr>
<td>Demo.</td>
<td>M 5</td>
<td></td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>I 5</td>
<td></td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100/-100 b-</td>
<td>100</td>
</tr>
</tbody>
</table>
### TABLE 5 (CONTINUED)

**Reliability Measures for the Observations of Teaching Behaviors**

<table>
<thead>
<tr>
<th>Behavior Categories</th>
<th>Subject</th>
<th>Baseline</th>
<th>Intervention 1</th>
<th>Intervention 2</th>
<th>Intervention 3</th>
<th>Intervention 4</th>
<th>Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Repeating</td>
<td>CM 3</td>
<td>(100)</td>
<td>(100)</td>
<td>(78)</td>
<td>(83)</td>
<td>(100)</td>
<td>(100*)</td>
</tr>
<tr>
<td>Answers ($)</td>
<td>M 4</td>
<td>(60)</td>
<td>(94)</td>
<td>(84)</td>
<td>(77)</td>
<td>(100)</td>
<td>(100*)</td>
</tr>
<tr>
<td></td>
<td>M 5</td>
<td>61/74b</td>
<td>78</td>
<td>(67)</td>
<td>(60)</td>
<td>(100)</td>
<td>(81)</td>
</tr>
<tr>
<td></td>
<td>L 5</td>
<td>72</td>
<td>69</td>
<td>85</td>
<td>(99)</td>
<td>(100)</td>
<td>(100*)</td>
</tr>
<tr>
<td></td>
<td>CM 6</td>
<td>89</td>
<td>92/92b</td>
<td>85</td>
<td>86</td>
<td>(100)</td>
<td>(100)</td>
</tr>
<tr>
<td></td>
<td>L 6</td>
<td>77</td>
<td>(89)</td>
<td>78</td>
<td>86</td>
<td>(100)</td>
<td>(89)</td>
</tr>
<tr>
<td>Selective</td>
<td>M 4</td>
<td>(100)</td>
<td>100-</td>
<td>100-</td>
<td>100-</td>
<td>(100)</td>
<td>(100*)</td>
</tr>
<tr>
<td>Attention</td>
<td>M 4</td>
<td>100*/100b-</td>
<td>100-</td>
<td>100-</td>
<td>100-</td>
<td>(100)</td>
<td>(100*)</td>
</tr>
<tr>
<td>Demo.</td>
<td>CM 6</td>
<td>100-</td>
<td>100*/100b-</td>
<td>100-</td>
<td>100-</td>
<td>(100)</td>
<td>(100)</td>
</tr>
<tr>
<td></td>
<td>L 6</td>
<td>(100)</td>
<td>(100)</td>
<td>100-</td>
<td>100-</td>
<td>(100)</td>
<td>(100)</td>
</tr>
<tr>
<td>Positive Interactions</td>
<td>M 4</td>
<td>(100)</td>
<td>100-</td>
<td>100-</td>
<td>100-</td>
<td>(100)</td>
<td>(100*)</td>
</tr>
<tr>
<td>Without Mis-</td>
<td>CM 6</td>
<td>100*/100b</td>
<td>(100)</td>
<td>(100)</td>
<td>(509)</td>
<td>(100)</td>
<td>(100)</td>
</tr>
<tr>
<td>behavior Cues</td>
<td>L 6</td>
<td>100-</td>
<td>100-</td>
<td>100-</td>
<td>100-</td>
<td>100-</td>
<td>100-</td>
</tr>
</tbody>
</table>

**NOTES:**

1 - Intern
CM - Cooperating/Model Teacher
M - Model Teacher
( ) - less than 10 behaviors occurred
- - there were no behaviors recorded by either observer
* - same reliability measure was used for Intervention 4 phase and the maintenance phase
b - only one or two instances of the behavior occurred during the entire lesson
a - all observers coded to obtain criterion-related agreement
above the acceptable level.

An "*" denotes situations where the reliability scores for the Intervention 4 phase were also used for the maintenance phase. In some of the replications the maintenance phase was limited by disruptions to the gymnasium program.

A "b" denotes instances where all three observers coded the same lesson. This usually occurred immediately following a retraining session to confirm criterion-related agreement. It also served as a crosscheck for observer drift.

There were a few occasions of extremely low agreements, denoted by an "a"; these were vantage point agreement of 0% and 50%, voice enthusiasm agreement of 0%, and a positive interaction with a misbehavior cue agreement of 50%. In each of these situations less than three instances of the behavior were recorded by either observer. Such low frequencies are a disadvantage to using nominal-agreement measures. Frick and Semmel (1978) suggest that a minimum of ten instances of the behavior are required to solve the problem of having a poor agreement score when the observers may have only disagreed on one or two instances of a behavior. In Table 5 those agreements emanating from between one and ten instances of a behavior in a 30 minute lesson are enclosed in parenthesis "( )". Of the 110 instances of agreements for events occurring on less than ten occasions 77.3 percent were above the acceptable level of 80 percent.

The range of mean agreements across subjects within a behavior were as follows:
Those behaviors with the lowest percent agreements had the greatest ranges, "prompt-observe-feedback" (II), "voice enthusiasm" (III), and "not repeating answers" (vi). These behaviors also had the lowest mean percent agreements across all phases of the study, those being 84.7, 86.6, and 86.2 percent respectively (see Table 6). One could infer from their low agreements, compared to other behaviors, and the high ranges that there were greater fluctuations in the appearance of these behaviors across subjects. It should also be noted that the frequencies of behaviors (II), (III), and (vi) were greater than any of the other behaviors.

Table 6 indicates that percent agreements were maintained throughout the phases of the study, Baseline, Intervention 1, Intervention 2, Intervention 3, Intervention 4 and Maintenance for all behaviors. On three occasions; a) "prompt-observe-feedback" in Intervention 1 (75.8 percent), b) "prompt-observe-feedback" in Intervention 2 (77.4 percent), and c) "no repeats" in Baseline (78.3 percent) the required level of agreement was not achieved. However following each of these recordings a retraining session was conducted.
## TABLE 6

### Mean Reliabilities of Teaching Behaviors of Each Phase of the Study

<table>
<thead>
<tr>
<th>Phase of Study</th>
<th>Teaching Behaviors</th>
<th>P-O- Vantage</th>
<th>FB</th>
<th>Enthusiasm</th>
<th>Check-list</th>
<th>N-D- Cue</th>
<th>No Repeats</th>
<th>S/A- Demo</th>
<th>+ve Intern.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td></td>
<td>100.0</td>
<td>87.3</td>
<td>83.9</td>
<td>100.0</td>
<td>100.0</td>
<td>78.3*</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Intern. 1</td>
<td></td>
<td>90.0</td>
<td>73.8*</td>
<td>81.8</td>
<td>100.0</td>
<td>100.0</td>
<td>88.1</td>
<td>100.0</td>
<td>90.0</td>
</tr>
<tr>
<td>Intern. 2</td>
<td></td>
<td>93.3</td>
<td>91.0</td>
<td>89.4</td>
<td>100.0</td>
<td>100.0</td>
<td>81.0</td>
<td>91.5</td>
<td>100.0</td>
</tr>
<tr>
<td>Intern. 3</td>
<td></td>
<td>95.6</td>
<td>77.4*</td>
<td>82.7</td>
<td>100.0</td>
<td>100.0</td>
<td>83.8</td>
<td>100.0</td>
<td>87.5</td>
</tr>
<tr>
<td>Intern. 4</td>
<td></td>
<td>95.5</td>
<td>84.0</td>
<td>90.9</td>
<td>93.2</td>
<td>100.0</td>
<td>95.9</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Maintenance</td>
<td></td>
<td>100.0</td>
<td>91.5</td>
<td>90.6</td>
<td>98.8</td>
<td>100.0</td>
<td>92.1</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

X \[=\] 95.2 84.7 86.6 98.7 100.0 86.2 98.8 96.5

Overall mean = 83.3

* = reliability score below the acceptable criterion.
and the percent agreements surpassed the criterion of 80 percent agreement in the subsequent phase (see Table 5 for the evidence of retraining indicated by two agreement recordings for the same lesson).

The overall inter-observer agreement calculated from the raw data, rather than by averaging the percent agreements for each reliability check, was 83.3 percent.

Reliability Discussion

Based upon the results of nominal inter-observer agreement and the accuracy of behavior discrimination reflected in the criterion-related agreements, the observation system used in this study appears to be a reliable source of data. Although there were instances of poor reliability these were genuinely acknowledged and immediate retraining was scheduled to locate the cause of disagreement and to adjust the observation system if needed.

Given that 85.8 percent of the inter-observer agreement percentages were above the agreed acceptable level of 80 percent it was assumed that the data reflected faithfully what actually happened during the teaching episodes.

Summary of the Data

The purpose of this study was to investigate the effect of a physical education cooperating teacher's modeling of specific teaching behaviors on the incidence of those behaviors in the teaching of a physical education intern. Four research questions were used to give direction to the investigation. The summary of the data attends to each of these questions and in so doing organizes the discussion to effectively attend to the purpose of the investigation. The multiple
baseline graphs in the following pages (see Figures 5, 6, 7, 8, 9, and 10) provide an overview of the data. These graphs are discussed further in relation to each research question.

Research Question 1

Would a systematic intervention including verbal suggestions, feedback, and modeling effect a significant change in Intern behavior?

This question relates to an investigation of the effects of Intervention B on the experimental group which included Cooperating Model teachers 1, 2, and 3 as part of the Intervention and Interns 1, 2, and 3.

Results and discussion for Intern 1

Intern 1's cooperating teacher (cm 1) was observed giving written suggestions once and feedback twice each week (see Table 7) according to the behavior change module guidelines (see Appendix E). Table 8 reveals that cm 1 modeled the four required teaching behaviors. Following the Initial Intervention cm 1 averaged (a) 3.6 "vantage points"; the criterion was 3 to 5, (b) 9.2 "prompt-observe-feedbacks", the criterion was 10 or more than 10, (c) 39.3 "enthusiasms"; the criterion was 40 or more, and (d) 19.3 "checklists" such that one or two objectives were recorded for each student; the criterion was one or two objectives recorded for each student.

Although the criteria for "prompt-observe-feedbacks" and "enthusiasms" were not, on the average, maintained following the Initial Intervention the graphs in figure 5 indicate that, in the first week of intervention for each behavior the criterion levels for each behavior, were modeled by cm 1. Also the average of "prompt-observe-
Figure 5. Multiple Baseline Analysis Across Behaviors: Experimental Group - Intern 1 and Cooperating/Model Teacher 1.
Figure 6. Multiple Baseline Analysis Across Behaviors: Experimental Group - Intern 2 and Cooperating/Model Teacher 2.
Figure 7. Multiple Baseline Analysis Across Behaviors: Experimental Group - Intern 3 and Cooperating/Model Teacher 3.
Figure 8. Multivariate Baseline Analysis Across Behaviors: Control Group
Figure 9. Multiple Baseline Analysis Across Behaviors: Control Group

Key

- Model
- Intern

BEHAVIORS/30 MINUTE LESSON

Instances of Use of Objective (Checklist)

Instances of Non-Descriptive (Cue for Demand)

Instances of Enthusiasm (Total answers)

Instances of Non-Descriptive Answers (% of total answers)

Consecutive School Weeks

Baseline Interim Maintenance

1 2 3 4 5 6 7 8
Figure 10. Multiple Baseline Analysis Across Behaviors: Control Group - Intern 6 and Cooperating/Model Teacher 6.


**TABLE 7**

*Record of the Cooperating Teachers Application of Written Suggestions and Feedback*

<table>
<thead>
<tr>
<th>Week of Study</th>
<th>Observation</th>
<th>cm 1</th>
<th>cm 2</th>
<th>cm 3</th>
<th>cm 4</th>
<th>cm 5</th>
<th>cm 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2.</td>
<td>1</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>X</td>
</tr>
<tr>
<td>4.</td>
<td>1</td>
<td>WS,F</td>
<td>WS,F</td>
<td>WS,F</td>
<td>WS,F</td>
<td>F</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>WS*</td>
<td>X</td>
</tr>
<tr>
<td>5.</td>
<td>1</td>
<td>WS,F</td>
<td>WS,F</td>
<td>F</td>
<td>WS,F</td>
<td>F</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>F</td>
<td>F</td>
<td>WS*</td>
<td>F</td>
<td>WS,F</td>
<td>X</td>
</tr>
<tr>
<td>6.</td>
<td>1</td>
<td>WS,F</td>
<td>X</td>
<td>F</td>
<td>WS,F</td>
<td>*</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>X</td>
<td>X</td>
<td>WS,F</td>
<td>F</td>
<td>*</td>
<td>X</td>
</tr>
<tr>
<td>7.</td>
<td>1</td>
<td>X</td>
<td>X</td>
<td>*</td>
<td>X</td>
<td>*</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>8.</td>
<td>1</td>
<td>X</td>
<td>WS,F</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>9.</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

F - teacher gave feedback to the intern

WS - teacher gave written suggestions to the intern

X - teacher was not required to give either written suggestions or feedback to the intern

* - teacher neglected to administer a component of the intervention
### TABLE 8

Mean Numbers or Percentage of Teaching Behaviors In Each Phase of the Study for the Experimental Group

<table>
<thead>
<tr>
<th>Phase of Study</th>
<th>Behaviors</th>
<th>Vantage</th>
<th>P-O-F.B.</th>
<th>Enthusiasm</th>
<th>Checklist</th>
</tr>
</thead>
<tbody>
<tr>
<td>c m Teacher 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>0.7</td>
<td>3.4</td>
<td>8.2</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>Intervention</td>
<td>3.6</td>
<td>9.2</td>
<td>39.3</td>
<td>19.3</td>
<td></td>
</tr>
<tr>
<td>MI-MB</td>
<td>+2.9</td>
<td>+5.8</td>
<td>+31.1</td>
<td>+19.3</td>
<td></td>
</tr>
</tbody>
</table>

| Intern 1       |           |         |          |            |           |
| Baseline       | 0.0       | 4.9     | 4.8      | 0.0        |           |
| Intervention   | 2.2       | 10.4    | 48.0     | 17.6       |           |
| MI-MB          | +2.2      | +5.5    | +43.2    | +17.6      |           |

| c m Teacher 2  |           |         |          |            |           |
| Baseline       | 1.0       | 4.3     | 6.6      | 0.0        |           |
| Intervention   | 4.7       | 11.2    | 27.3     | 17.5       |           |
| MI-MB          | +3.7      | +6.9    | +20.7    | +17.5      |           |

| Intern 2       |           |         |          |            |           |
| Baseline       | 0.3       | 3.2     | 8.8      | 0.0        |           |
| Intervention   | 5.2       | 12.9    | 25.2     | 10.5       |           |
| MI-MB          | +4.9      | +9.7    | +16.4    | +10.5      |           |

<table>
<thead>
<tr>
<th>N-D-Cue No Repeats (%)</th>
<th>Enthusiasm</th>
<th>Checklist</th>
</tr>
</thead>
<tbody>
<tr>
<td>c m Teacher 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Intervention</td>
<td>0.9</td>
<td>43.8</td>
</tr>
<tr>
<td>MI-MB</td>
<td>+0.9</td>
<td>+43.8</td>
</tr>
</tbody>
</table>
### TABLE 8 (CONTINUED)

**Mean Numbers or Percentage of Teaching Behaviors in Each Phase of the Study for the Experimental Group**

<table>
<thead>
<tr>
<th>Phase of Study</th>
<th>N-D-Cue</th>
<th>No Repeats (%)</th>
<th>Enthusiasm</th>
<th>Checklist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intern 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>0.0</td>
<td>0.0</td>
<td>12.5</td>
<td>0.0</td>
</tr>
<tr>
<td>Intervention</td>
<td>2.0</td>
<td>44.8</td>
<td>27.2</td>
<td>17.0</td>
</tr>
<tr>
<td>MI-MB</td>
<td>+2.0</td>
<td>+44.8</td>
<td>+14.7</td>
<td>+17.0</td>
</tr>
</tbody>
</table>

**NOTES:**

The frequencies of the behaviors are for a 30 minute lesson.

Definitions of the behaviors are contained in Chapter Three.

Vantage = Vantage Point
P-O-F.B. = Prompt-Observe-Feedback
Enthusiasm = Voice Enthusiasm
Checklist = Objective Checklist
N-D-Cue = Non-Descriptive Cue for a Demonstration
No Repeats (%) = Not Repeating Student's Answers (%)
feedbacks" and "enthusiasms", following the initial intervention, were only 0.8 and 0.7 of an instance below the criterion. The marked decrease in the instances of "objective checklist" behaviors (see Figure 5) did not effect the achievement of the criterion for checklist. The decrease was typically the result of more efficient recording techniques.

Table 8 indicates that Intern 1, on the average, achieved criterion levels for "prompt-observe-feedback" (10.4), "enthusiasm" (48.0), and "objective checklist" (17.6) behaviors. The score of 2.2 for the intervention on "vantage point" behavior did not reach the criterion of 3 to 5 instances of "vantage point". However, visual inspection of the graph (see Figure 5) reveals that criterion was achieved in the first week of Intervention and consistently reached during maintenance.

Figure 5 confirms that significant changes in the intern's behavior had occurred, from baseline to Intervention, for all behaviors. "Vantage point", "voice enthusiasm", and "objective checklist" showed immediate elevations to the criterion level. "Prompt-observe-feedback" did not reach criterion until the week after the week of Intervention. However; a) the graph shows that the model (cm 1) was also slow to achieve criterion for "prompt-observe-feedback", and b) the table reveals that there was a greater than 100% increase in the average baseline score for "prompt-observe-feedback" during intervention.

Results and discussion for Intern 2

Intern 2's cooperating teacher (cm 2) was observed giving written
suggestions once and feedback twice (see Table 7) each week according to the behavior change module guidelines (see Appendix E). Table 8 reveals that \textit{cm 2} modeled three of the four required teaching behaviors. Following the initial intervention \textit{cm 2} averaged: a) 4.7 "vantage points", the criterion was 3 to 5; b) 11.2 "prompt-observe-feedbacks", the criterion was 10 or more than 10; c) 27.3 "enthusiasms", the criterion was 40 or more than 40; and d) 17.5 "checklists" such that one or two objectives were recorded for each student, the criterion was one or two objectives recorded for each student.

Although the criterion for "voice enthusiasm" was not, on the average, maintained following the initial intervention Figure 5 indicates that for six of the nine observations after baseline the \textit{cm 2} modeled the appropriate criterion levels for "voice enthusiasm". On the other hand, although Table 8 indicates that criterion was achieved for "prompt-observe-feedbacks" during the intervention phase, Figure 6 (graph) reveals that \textit{cm 2} did not model the criterion for "prompt-observe-feedback" in seven of the eleven observations after baseline.

The checklist behavior was modeled appropriately but it was only displayed by the model on one occasion. The extended intervention 3 phase (see Figure 6) was scheduled at the request of subject \textit{cm 2} who wanted to delay the introduction of the checklist until the class had finished preparing for the annual physical education display. This meant that there were only two possible observations of checklist behavior before the end of the school year. The first of the final two
132 observations coincided with the introduction of the "objective checklist". The last observation was also the last day of the school year and the teacher decided that a checklist strategy was not warranted.

Visual inspection of the graph, Figure 6, reveals that two to three weeks after the initial intervention the model's modeling of the target behaviors deteriorates such that the frequencies approach baseline levels.

Table 8 indicates that Intern 2, on the average, achieved the criterion levels for "vantage point" (5.2), "prompt-observe-feedback" (12.9), and "checklist" (10.5). The "voice enthusiasm" frequency of 25.2 was well below the criterion of 40. However, the graph (see Figure 6) indicates that despite not achieving criterion levels the change from baseline to intervention was substantial. The average frequency of "voice entusiasms" on baseline was 8.8 while the average frequency following the intervention was 25.2, an change of 16.4.

Figure 6 confirms that significant changes in Intern 2's teaching behavior occurred from baseline to intervention for all of the target behaviors. "Vantage point" and "voice enthusiasm" behaviors did not reach the criterion levels of "3" and "40" respectively until the second observation in the week of intervention. The graph also shows that "prompt-observe-feedback" criterion (10+) was met during the first observation following the initial intervention; however, the frequency of this behavior rose to 48 instances during the second observation in the week of intervention.
**Results and discussion for Intern 3**

Intern 3's cooperating teacher was observed giving written suggestions once and feedback twice (see Table 7), according to the behavior change module guidelines, in all weeks other than weeks five and seven. In week five cooperating model teacher 3 (cm 3) did not give feedback for observation 2 and in Week 7, cm 3 did not give feedback for Observation 1. Table 8 reveals that cm 3 modeled one of the four required target behaviors at the criterion level. Following the Initial Intervention cm 3 averaged: a) 0.9 "non-descriptive cues for a demonstration", the criterion was 3 to 5; b) 43.8 "percent of no repeats" compared to "repeats", the criterion was 50%; c) 34.8 "voice enthusiasms", the criterion was 40; and d) 8.0 "objective checklists" such that one or two objectives were recorded for each student, the criterion was one or two objective recorded for each student.

Although the average frequencies and percentages indicate that three of the four behaviors have not been modeled by cm 3, the graph in Figure 7 reveals the following:

1. Instances of "non-descriptive cues for demonstrations" exceeded the baseline level during five of the eleven observations following the Initial Intervention. On one occasion the frequency (6.0) surpassed the criterion (3 to 5).

2. Percents of "not repeating answers" compared to "repeating answers" achieved the criterion level (50%) during five of the nine observations following the Initial Intervention. Seven of the nine observations following the Initial Intervention produced "percents of no repeats" which were 30 percent or more greater than the baseline.
percentages for not repeating answers.

3. Instances of "voice enthusiasm" achieved the criterion level (40) during three of the six observations following the initial intervention for this behavior. Prior to intervention the "voice enthusiasm" criterion was not reached during any baseline observation.

Table 8 indicates that Intern 3, on the average, achieved the criterion level for "checklist" (17.0); that is one or two objectives were recorded for each student. Criterion was not achieved for "non-descriptive cue for a demonstration" (2.0), "percent of no repeats" (44.8), and "voice enthusiasm" (27.2). However, the change from baseline to intervention was significant with all the averages for behaviors, following their initial intervention, being 100 percent or more of their baseline frequency or percent.

Visual inspection of the graphs (see Figure 7) confirm that a substantial change had occurred from baseline to intervention for "non-descriptive cues", "percentage of non-repeats" and "objective checklist". A less obvious change was evident for "voice enthusiasm" due to the fluctuating baseline frequencies and the increasing baseline scores during the last four data points in baseline. To clarify that a change had occurred, celeration lines (Hersen and Barlow, 1978) were calculated and included on the voice enthusiasm portion of the multiple baseline graph in Figure 7. The celeration lines confirm that a significant change was evident for the "voice of enthusiasm" behavior of Intern 3, between baseline and intervention. The change in behavior after intervention was immediate for "percentage of non-repeats"; "voice enthusiasm", and "objective checklist". A minimal change from
0.0 (baseline) to 1.0 (Initial Intervention) for the "non-descriptive cue for a demonstration" was followed by more dramatic and significant changes during Week 4.

Discussion of Question 1

Clinical significance is reported when the behavior in this study changed from frequencies that could result in ineffective teaching to frequencies which could result in effective teaching. Effective teaching frequencies and percentages (criterion levels) were derived from the research on effective physical education teaching reported in Sledentop, (1983), combined with the experimenter's knowledge of both the ecologies of the gymnasiums and the teaching abilities of the model teachers and interns.

The results indicate that clinically significant changes in the Interns' teaching behaviors for the experimental group occurred for seven of the 12 observed behaviors (see Table 8) when the frequencies and percentages were averaged across the baseline and intervention phases.

Visual inspections of the graphs (see Figures 5, 6 and 7) reveal that the Intervention of feedback, written suggestions, and modeling effected mutually exclusive and significant changes in all of the target behaviors of each intern. Also, if only for one or two observations, the criterion level was achieved on at least two occasions for each of the behaviors of Intern's 1, 2 and 3.

Invariably the Intern did not achieve criterion if the cooperating model teacher did not model the criterion levels. Baselines of both
the teachers and Intern supported the pre-study findings (see Appendix D) that there were absences of these behaviors in their teaching repertoires.

Research Question 2

Would a systematic intervention including verbal suggestions and feedback effect a significant change in an Intern's teaching behavior if the model teacher or cooperating model teacher did not model the target behavior?

This question relates to an investigation of the effects of Intervention A (see Figure 2) on the control group which included Cooperating Teachers 4 and 5 (c4 and c5), Model Teachers 4 and 5 (m4 and 5) and Cooperating Model Teacher 6 (cm6) as part of the intervention and Interns 4, 5, and 6. It should be noted that Cooperating teacher 5 (c5) was also cm3 and m4 was also m5.

Results and discussion for Intern 4

Intern 4's cooperating teacher (c4) was observed giving written suggestions once and feedback twice each week according to the behavior change module (see Appendix E).

Table 9 reveals that m4 did not model any of the criterions of the target behaviors. Following the initial intervention m4 averaged: a) 0.7 "positive interactions", criterion was 5 to 10; b) 26.7 "percent of no repeats", criterion was 50 percent; c) 0.2 "selective attention demonstrations", criterion was 3 or more; and d) "0" "objective checklists", criterion was to record one or two objectives for each student.

Although the criterion for "percentage of no repeats" was not modeled, m4's teaching behavior indicated a substantial change (23.4%)
<table>
<thead>
<tr>
<th>Phase of Study</th>
<th>Behaviors</th>
<th>+ve Interactions</th>
<th>No Repeats (%)</th>
<th>S/A-Demo.</th>
<th>Checklist</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M Teacher 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>0.5</td>
<td>3.3</td>
<td>0.3</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Intervention</td>
<td>0.7</td>
<td>26.7</td>
<td>0.2</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>MI-MB</td>
<td>+0.2</td>
<td>+23.4</td>
<td>-0.1</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td>Intern 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>0.3</td>
<td>1.9</td>
<td>0.5</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Intervention</td>
<td>0.8</td>
<td>22.2</td>
<td>0.2</td>
<td>9.3</td>
<td></td>
</tr>
<tr>
<td>MI-MB</td>
<td>+0.5</td>
<td>+20.3</td>
<td>-0.3</td>
<td>9.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>cm Teacher 6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>0.0</td>
<td>3.8</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Intervention</td>
<td>0.8</td>
<td>45.1</td>
<td>0.3</td>
<td>38.7</td>
<td></td>
</tr>
<tr>
<td>MI-MB</td>
<td>+0.8</td>
<td>+38.0</td>
<td>+0.3</td>
<td>38.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Intern 6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>0.0</td>
<td>2.6</td>
<td>0.9</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Intervention</td>
<td>0.0</td>
<td>45.1</td>
<td>0.1</td>
<td>38.8</td>
<td></td>
</tr>
<tr>
<td>MI-MB</td>
<td>+0.0</td>
<td>+42.5</td>
<td>-0.8</td>
<td>38.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N-D-Cue</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>0.0</td>
<td>8.7</td>
<td>18.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Intervention</td>
<td>0.0</td>
<td>21.6</td>
<td>15.7</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>MI-MB</td>
<td>0.0</td>
<td>+12.9</td>
<td>-2.3</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>
### TABLE 9 (CONTINUED)

Mean Numbers or Percentage of Teaching Behaviors In Each Phase of the Study for the Control Group

<table>
<thead>
<tr>
<th>Phase of Study</th>
<th>+ve Interactions</th>
<th>No Repeats (%)</th>
<th>S/A-Demo.</th>
<th>Checklist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intern 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>0.0</td>
<td>26.4</td>
<td>15.6</td>
<td>0.0</td>
</tr>
<tr>
<td>Intervention</td>
<td>1.1</td>
<td>26.3</td>
<td>14.6</td>
<td>0.0</td>
</tr>
<tr>
<td>MI-MB</td>
<td>+1.1</td>
<td>-0.1</td>
<td>-1.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

**NOTES:**

The frequencies of the behaviors are for a 30 minute lesson.

Definitions of the behaviors are contained in Chapter Three.

+ve Interactions = Positive Interactions With a Misbehavior Cue  
No Repeats (%) = Not Repeating Students' Answers (%)  
S/A Demonstration = Selective Attention Demonstrations  
Checklist = Objective Checklist  
N-D-Cue = Non-Descriptive Cue for a Demonstration  
Voice Enthusiasm = Voice Enthusiasm
In this behavior from baseline to Intervention according to the average percents within these two phases of the study. According to the raw data for m4 the 23.4% change represents four more "no repeats" and six less "repeats" per 30 minute lesson. Considering that the most reactions m4 gave to student answers was 17 a change of 23.4% would be noticeable if, as in this case, baseline levels of "non-repeats" were either 0.0 or 1.0.

Table 9 indicates that Intern 4, on the average, achieved the criterion for the "objective checklist" behavior (9.3) Intern 4 did not achieve criterion, on the average, for "positive interactions" (0.8), "percentage of no repeats" (22.2%), and "selective attention demonstrations" (0.2). However, as was the case with the model teacher (m4) the Intern displayed a substantial change (20.3%) in the "percentage of no repeats" from baseline to Intervention phases. The 0.5 change in frequency for "positive interactions" and -0.3 for "selective attention demonstrations" would be classified as "no change".

Figure 8 confirms that the criterion levels for "positive interaction", "percentage of no repeats" and "selective attention demonstrations" were not achieved during any observation following the initial Intervention. The graph (Figure 8) shows that the weeks of intervention effected changes in three of the four behaviors. The change was measured against the last baseline data point. The fourth behavior, "positive interactions", was maintained at the frequency achieved during the last baseline observation (1.0). Following the week of intervention the target behaviors, including the objective
checklist, returned almost immediately to baseline levels of occurrence.

Minor fluctuations of three of the behaviors during baseline ("objective checklist" remained constant at "0" during baseline) are typically preceded by similar fluctuations in the model teacher's behavior. Also the multiple baseline graph indicate that the Intern's use of "objective checklists" began and maintained during the week of intervention but returned to baseline levels during maintenance. The "objective checklist" was the only behavior in which there was a noticeable and clinically significant change during intervention which was not accompanied by similar changes in the model teacher's behavior.

Results and discussion for Intern 5

Intern 5's cooperating teacher (c5) was also Intern 3's cooperating model teacher (cm3). Cooperating Teacher 5 was observed giving written suggestions once and feedback twice (see Table 7), according to the behavior change module guidelines in all weeks other than Weeks 4, 6, and 7.

It should be noted that Intern 5 began the study one week after the other subjects due to a commitment in competitive gymnastics which prevented him from commencing his teaching practice until the second week. Therefore, the "Week of Study" column in Table 7 is the week of study for each individual Intern. The week notations do not represent calendar weeks in terms of week 1, 2 to 10 being particular dates.

In Week 4, Observation 2, c5 did not give feedback to the Intern. In Week 6, Observation 1, c5 did not give feedback to the Intern and then during Observation 2 did not give the required written suggestions
or feedback for the final intervention. In Week 7, Observation 1, c5 did not give feedback to the Intern.

Table 9 reveals that m5 did not model any of the target behaviors. Following the Initial Intervention m5 averaged: a) 0.0 "non-descriptive cues", criterion was 3 to 5; b) 21.6 "percent of no repeats", criterion was 50.0 percent; c) 15.7 "voice enthusiasm", criterion was 40; and d) "0" "objective checklists", criterion was to record one or two objectives for each student. Also there were no substantial changes in m5's target behaviors from baseline to Intervention. "Non-descriptive cue" and "objective checklist" remained at "0.0" throughout baseline and Intervention and the "percentage of no repeats" changed merely 12.9 percent. The 12.9 percent was equivalent to an increased frequency of only two "no repeats"! "Voice entusiasms" decreased by 2.3 Instances from baseline to Intervention.

Intern 5, on the average (see Table 9), did not achieve criterion for any of the target behaviors. The closest score to the criterion, taken from the averages of baseline or Intervention scores for each behavior were: a) "non-descriptive cue" 1.1; b) "percentage of no repeats" 26.4; c) "voice enthusiasm" 15.6; and d) "checklist" 0.0. Changes in the average frequencies and percentage from baseline to Intervention were: a) "non-descriptive cue" 1.1; b) "percentage of no repeats" -0.1; c) "voice enthusiasm" -1.0; and d) "checklist" 0.0.

Figure 9 is more representative of Intern 5's behavior than Table 9 because the data for each observation are presented. While Table 9 results suggest that the intervention has not effected the Intern's use of "non-descriptive cues for demonstrations" it is obvious from the
graph (see Figure 9) that there has been an immediate and significant change which results in the frequency of "non-descriptive cues" moving from 0.0 (baseline) to 7.0 (Intervention). A level which surpasses the criterion. This situation is evidence of a common problem with statistics which "collapse" the raw data into mean values. Although the "percentage no repeat" averages indicate "no change" from baseline to intervention the graphs indicate a 12.0 percent increase immediately following the initial intervention. For 15, a 12.0 percent increase represented an increase of six "no repeats" in a total frequency of 32 reactions to student's answers. This is a substantial increase. Confidence in the fact that the intervention effected this change is tempered by the gradually increasing baseline which precedes the intervention phase.

A similar result was obtained for "voice enthusiasm". There was a change in this teaching behavior (see Figure 9) portrayed by the acceleration lines, which was substantial from baseline to intervention. However, fluctuations during baseline almost reached criterion levels and certainly exceeded the frequencies of any observations following intervention. While it could be assumed that intervention A for "voice enthusiasm" effected a change between Observation 1 and 2 of Week 5, it could also be argued that this change was symptomatic of the intern's previous teaching behavior repertoire.

Intern 5 showed "no change" in "objective checklist" behavior (see Figure 9). Table 7 reveals that c5 did not apply the intervention for this behavior. It could be presumed that the combination of no modeling, no written suggestions and no feedback resulted in the
complete neglect of the "objective checklist" behavior by the Intern.

Results and discussion for Intern 6

Intern 6's Cooperating Model Teacher (cm 6) was also the school athletic director. He informed the experimenter, during baseline data collection, that because of the need to organize school camps it would be difficult for him to observe the Intern and provide feedback twice each week for the remainder of the study. Also, he suggested that he be able to model the "checklist" behavior because he consistently used objective checklists to record the performance of the students in his track and field unit. Rather than abandon this replication it was decided to continue the study and include either model (Intervention B) or no model (Intervention A) interventions when cm 6 could accommodate the procedures.

It was decided that cm 6 would avoid giving written suggestions and feedback about the target behaviors. Instead he modeled the required target behaviors, according to the sequence advocated in the behavior change module, as soon as possible during the suggested intervention week.

Following the request to model the behavior cm 6 averaged: a) 0.8 "positive interactions", criterion was 5 to 10; b) 41.8 percent of "no repeats", criterion was 50.0 percent; c) 0.3 "selective attention demonstrations", criterion was 3 or more; and d) 38.7 "objective checklist's" for which one or two objectives were recorded for each student, criterion was one or two objectives recorded for each student.

Although the criteria for "percentage of no repeats" and "positive interactions" were not, on the average, maintained following the
Initial Intervention the graph in Figure 10 indicates that criterion levels were modeled once (Observation 2, Week 3) for "positive interactions" and three times (Observation 1, Week 4; Observation 1, Week 6; Observation 2, Week 7) for "percentage of no repeats". Criterion was at no stage reached for "selective attention demonstrations", however, there was a change from baseline to intervention. Of the eight observations following and including the initial interventions, cm 6 modeled one instance of a "selective attention demonstration" during three observations.

Table 9 indicates that Intern 6, on the average, achieved the criterion level for the use of an "objective checklist" (38.8). This was within 0.1 of the frequency produced by the model (cm 6). "Positive interactions" (0.0), "percentage of no repeats" (45.1), and "selective attention demonstrations" (0.9 in baseline, and 0.1 in following intervention) did not reach the criterion levels.

Figure 10 reveals that for "positive interactions", there was "no change" in the Intern's behavior despite the minimal changes in the model's behavior. It could be assumed that an average model change of 0.8 instances per 30 minute lessons would not be sufficient to be noticeable. Also the fact that the behavior was only modeled more than once in one of 13 lessons and was not modeled at all in six of the 13 lessons could explain the lack of change in the Intern's behavior. It also should be remembered that 16 was not instructed to attend to the target behaviors and that in this particular case the behavior of "positive interaction without a misbehavior cue" typically only lasted for less than five seconds.
Criterion was not reached, on the average, for the "percentage of no repeats". However, it was achieved during seven of the 11 observations following the Initial Intervention, and the change from baseline to intervention (42.5) was a significant change (see Figure 10).

Averages reported in Table 9 for "selective attention demonstrations" indicate that although the changes were minimal (cm 6, +0.3; 16, -0.8) they were in the opposite direction for the model and observer (Intern). Once again the graph (see Figure 10) exposed the limitations of "averaging" statistics. Despite the bipolar changes, the graph reveals that 16's variable baseline frequencies changed to closely resemble the behavior of cm 6 during intervention.

In summary, the teaching behavior of Intern 6 changed for three of the four behaviors. The changes coincided with the intervention which included cm 6 modeling the target behaviors and which did not include written suggestions or feedback.

Discussion of Question 2

The results of two (15 and 16) of the three control studies were somewhat inconclusive due to the lack of control of the behavior of c5 and cm 6 to accurately implement the planned intervention strategies.

Apart from the "checklist" behavior of 14 and the "positive interaction" behavior of 15 and 16 the changes in the Intern's behavior, according to the averages, closely resembled that of their respective model teachers.

The fact that the criterion levels were not achieved for seven of the eight behaviors which were subjected to Intervention A suggests
that written suggestions and feedback alone were not able to effect clinically significant changes in Intern 4 and Intern 5's behavior (see Table 9). For one of the eight behaviors the possible effects of Intervention A were masked by a concurrent change in the model teacher's behavior which accompanied the initial intervention (see "non-repeats" in Figure 8). For all other behaviors the changes in the intern's behaviors were insignificant and tended to mirror the changes in the model teacher.

Three of the four behaviors studied for Intern 6 (see Figure 10) confirmed that even without written suggestions and feedback there can be significant changes in teaching behavior. These changes were greatly effected by the changes in the model teacher (cm 6).

It is apparent from the results that a systematic intervention including verbal suggestions and feedback can effect significant changes in Intern behavior as was evidenced in the "non-descriptive cues for a demonstration" for Intern 5 and the "objective checklist" for Intern 4. However, for all other behaviors it appears that this was not the case and interestingly the behavior changes did not surpass the frequencies and percentages of the respective Interns' model teacher despite the fact that the changes in the model teacher's behaviors were minimal.

**Research Question 3**

Would the changes in an intern's teaching behavior be rapid, substantial and lasting when he/she has observed a model teacher modelling the desired behaviors in conjunction with written suggestions and feedback?
Figures 5, 6, 7, and 10 represent data for Interns 1, 2, 3 and 6 who were exposed to a model who modeled the desired teaching behaviors.

### Results and discussion for Intern 1

Figure 5 reveals that there was an immediate (rapid) and substantial change from baseline to the first observation following intervention for "vantage point" (0.0 to 4.0), "voice enthusiasm" (5.0 to 36.0), and "objective checklist" (0.0 to 33.0) teaching behaviors in Intern 1. The change in "prompt-observe-feedback" behavior was not immediate but when it did occur it was substantial (0.0 to 21.0). A possible reason for the delay could have been the failure of cm 1 to model the behavior accurately during the initial intervention (see Figure 5).

It was apparent that the changes in the target behaviors of the Intern were lasting provided they were modeled continually by cm 1. As was noted in the discussion of Question 1 for Intern 1 the reduction in the frequencies of "objective checklist" behavior was due to the use of a more efficient checklist system. Therefore, the criterion of "one or two behaviors being recorded for each student" was maintained throughout the study's baseline, intervention and maintenance phases.

During baseline the Intern behavior trends typically resembled those of the model. This supports the notion that the model effects the behavior of the Intern as was indicated in the investigation of the observations following intervention.

### Results and discussion for Intern 2

Figure 6 reveals that there was a rapid, although not immediate, and substantial change from baseline to the second observation
following intervention for "vantage point" (0.0 to 7.0), "prompt-observe-feedback" (4.0 to 48.0), and "voice enthusiasm" (11.0 to 41.0). The change in "objective checklist" behavior was immediate (rapid) and substantial (0.0 to 21.0). However, as was mentioned in the discussion of Question 1, cm 2 did not want to introduce the checklist behavior until the end of the study and even then for only one lesson. As had occurred with "prompt-observe-feedback" for Intern 1, the slight delay in the achievement of criterion levels for the first three behaviors of Intern 2 could have been due to the failure of cm 2 to model the behaviors accurately during the initial intervention (see Figure 6).

Changes in the target behaviors of the intern were lasting provided they were modeled continually by cm 2. Visual inspection of the graphs in Figure 6 indicates that trends in the performance of cm 2 are accompanied by almost identical trends in the behavior of 12.

It is interesting to observe that in Figures 5, 6 and 7 the introduction of a new behavior coincided with an immediate reduction in the frequency or percentages of the previously intervened upon behavior for both the intern and cooperating teacher. This perhaps suggests that the concentrated attention given to the intervention behavior may have resulted in the intern and cooperating model teacher neglecting their performance of other non-routinized behaviors.

During baseline, 12's behavior trends closely resembled those of cm 2. This supports the notion that observation of the model's teaching behavior effects the teaching behavior of the intern as was indicated in the investigations of the observations following intervention and
also in the study of Intern 1.

**Results and discussion for Intern 3**

Figure 7 reveals that there was an immediate (rapid) and substantial change, in the behavior of Intern 3, from baseline to the first observation following intervention for "percentage of no repeats" (0.0 to 67.0), "voice enthusiasm" (15.0 to 31.0), and "objective checklist" (0.0 to 28.0). The change in "non-descriptive cue for demonstration" (0.0 to 3.0) did not occur until the third observation following intervention. The delay, as with Interns 1 and 2, could have been attributed to the accompanying delay in cm 3's modeling of criterion frequencies, however, l3 achieved the criterion level (3.0) for this behavior before cm 3 had modeled it accurately. During the intervention cm 3 did model 2.0 "non-descriptive cues for a demonstration" and this may have been sufficient when combined with feedback to effect the appropriate criterion change in l3.

Changes in the target behaviors of l3 were lasting provided they were modeled continually by cm 3. This was evident throughout all phases of this study, Baseline, Intervention and Maintenance. Although the trends in the teaching behaviors of l3 and cm 3 did not "mirror" each other as closely as they did in the study of Intern's 1 and 2 the slopes of the trends closely resemble each other in all the behaviors other than for the intervention and maintenance portions of "voice enthusiasm". In these phases the trend for cm 3 is slightly increasing while the trend for l3 is slightly decreasing, the difference is minimal and only becomes comparable using a "split middle trend estimation" (Hersen and Barlow, 1978, p. 303).
Discussion of research Question 3

The multiple baseline graph across behaviors clearly indicates the effect of the Intervention on the behavior of the Interns. It also enables the investigator to assess the nature of the changes in behavior and whether or not the changes are lasting. Where there was variability between observations the use of "split middle trend estimation" enabled the investigator to confirm the existence of less obvious trends in the characteristics of the target behaviors (see Figure 7, "voice enthusiasm").

It is obvious from the analysis and discussion of the three Interns (11, 12 and 13) that the results have been replicated sufficiently to confirm the findings and give credibility to the discussion of consistencies between subjects.

For Interns 1, 2 and 3 the close association between the behavior of the model and Intern, with or without the presence of written suggestions and feedback (written suggestions and feedback only occurred during the week of Intervention) indicated that the teacher's modeling of the desired behaviors effected the characteristics of the change in behavior in that the changes were rapid, substantial and lasting depending on the accuracy of the modeled behaviors.

Research Question 4

Does modeling effect more rapid, substantial and lasting changes in Intern behavior than verbal suggestions and feedback?

The answer to this question was found by comparing the experimental group with the control group. Intern 6 is necessarily excluded from this comparison because the study of 16 did not include
the controlled intervention elements of written suggestions and feedback. However, some of the results in the 16 investigation are pertinent to this discussion and were included where they were appropriate.

Briefly, the control groups were: a) exposed to models who did not model the desired behaviors, although as was noted in the discussion of Question 2 some of the target behaviors were partially modeled (criterion not reached) by the control group teachers; and b) given written suggestions and feedback by their cooperating teacher. The experimental group was: a) exposed to a model teacher who did model the desired behaviors; and b) given the same standard written suggestions and feedback by their cooperating teacher. A comparison of the results of these two groups would reveal whether or not the modeling element of the intervention contributed to the effect of the intervention and what was the extent of the contribution.

Table 10 provides the results for those target behaviors which were common to both experimental and control interns. The scores are the averages of the scores across the baseline and intervention (Intervention average includes the maintenance phase) phases and are taken from Tables 8 and 9.

**Results and discussion of common target behaviors**

Table 10 indicates that for "percentages of no repeats" teaching behavior the experimental intern, 13, achieved an average of 43.8 percent while the control interns, 14 and 15, achieved 22.2 percent and 26.3 percent respectively. Also, Intern 6 who was exposed only to a model achieved 45.1 percent. Interns 3 and 6 showed gains of 43.8 and
## TABLE 10

Mean Numbers or Percents of Behaviors for the Control and Experimental Interns

<table>
<thead>
<tr>
<th>Intern</th>
<th>Baseline</th>
<th>Intervention</th>
<th>MI-MB</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&quot;Percentages of No Repeats&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3E</td>
<td>0.0</td>
<td>43.8</td>
<td>+43.8</td>
</tr>
<tr>
<td>6*</td>
<td>2.6</td>
<td>45.1</td>
<td>+42.5</td>
</tr>
<tr>
<td>4C</td>
<td>1.9</td>
<td>22.2</td>
<td>+20.3</td>
</tr>
<tr>
<td>5C</td>
<td>26.4</td>
<td>26.3</td>
<td>-0.1</td>
</tr>
<tr>
<td></td>
<td>&quot;Voice Enthusiasm&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1E</td>
<td>4.8</td>
<td>48.0</td>
<td>+43.2</td>
</tr>
<tr>
<td>2E</td>
<td>8.8</td>
<td>25.2</td>
<td>+25.2</td>
</tr>
<tr>
<td>3E</td>
<td>12.5</td>
<td>27.2</td>
<td>+14.7</td>
</tr>
<tr>
<td>4C</td>
<td>15.6</td>
<td>14.6</td>
<td>-1.0</td>
</tr>
<tr>
<td></td>
<td>&quot;Objective Checklist&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1E</td>
<td>0.0</td>
<td>17.6</td>
<td>+17.6</td>
</tr>
<tr>
<td>2E</td>
<td>0.0</td>
<td>10.5</td>
<td>+10.5</td>
</tr>
<tr>
<td>3E</td>
<td>0.0</td>
<td>17.0</td>
<td>+17.0</td>
</tr>
<tr>
<td>6*</td>
<td>0.0</td>
<td>38.8</td>
<td>-38.8</td>
</tr>
<tr>
<td>4C</td>
<td>0.0</td>
<td>9.3</td>
<td>+9.3</td>
</tr>
<tr>
<td>5C</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td>&quot;Non-Descriptive Cue for a Demonstration&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3E</td>
<td>0.0</td>
<td>2.0</td>
<td>+2.0</td>
</tr>
<tr>
<td>5C</td>
<td>0.0</td>
<td>1.1</td>
<td>+1.1</td>
</tr>
</tbody>
</table>

**NOTES:**
Intern 6 denoted by a (*) did not receive written suggestions or feedback as part of the intervention. The intervention for Intern 6 was modeling only.

MI = mean of the intervention phase scores
MB = mean of the baseline phase scores
E = Experimental
C = Control
42.5 percent respectively while Intern 4 showed a gain of 20.3 and Intern 5 a loss of 0.1 percent. It is evident that modeling had a considerable effect over and above the effect of written suggestions and feedback on the "percentage of no repeats" behavior of the interns.

Visual inspection of the graphs (see Figures 7, 8, 9 and 10) reveals that the change in "percentage of no repeats" behavior was significantly more rapid, substantial and lasting for 13 and 16 than for the control interns, 14 and 15. For 13 this behavior was maintained at 20.0 percent or higher for nine consecutive sessions and for 16 the behavior was maintained at 15.0 percent or above for seven consecutive observations. On the other hand, for 14 and 15 the "percentage of no repeats" returned to and remained at 0.0 percent during the fourth and subsequent observations following the initial intervention.

A second behavior common to both the experimental and control interns was "voice enthusiasm". Table 10 indicates that "voice enthusiasm" for the three experimental interns, 11, 12, and 13 achieved levels of 48.0, 25.2, and 27.2 Instances respectively while the control Intern, 15, achieved a level of 14.6 Instances. Interns 1, 2 and 3 made gains in "voice enthusiasm" of 43.2, 25.2 and 14.7 instances respectively while 15's voice enthusiasms decreased by 1.0 instance from baseline to intervention. Once again it is evident that modeling had a considerable effect on Intern's use of voice enthusiasm, an effect which significantly surpassed the effect of written suggestions and feedback.

Visual inspection of the graphs (see Figure 5, 6, 7, and 9) reveals
that all of the experimental Interns had significantly more lasting and substantial changes in "voice enthusiasm" behavior than the control Intern(15). The changes from the last data point in baseline to the first data point after intervention were 16.0 for 13, 31.0 for 11, 12.0 for 12, and 9.0 for 15. There is little difference between 15 and either 13 or 12 however this change for 15 is typical of the baseline fluctuations and may not be attributable to the intervention. Baseline levels only were maintained for "voice enthusiasm" by 15 throughout the intervention phase. Therefore while the initial changes for 13 and 12 were similar to that of 15 the changes in "voice enthusiasm" for 12 and 13 were more significant because they surpassed the baseline data.

Another behavior common to both the experimental and control Interns was the "objective checklist". It is important to identify that a higher score for the "objective checklist" behavior does not necessarily mean "better". The criterion for this behavior was the recording of one or two behaviors for each child. Sometimes a lower score indicated that this task was conducted more efficiently. Therefore, the issue in this discussion was whether or not the "objective checklist" behavior occurred and if so was it lasting.

Table 10 indicates that for each of the experimental Interns, 11(17.6), 12(10.5), and 13(17.0) the "objective checklist" behavior was performed. Control Intern 4(9.3) achieved this behavior as did Intern 6(38.8). However 15(0.0) did not produce any "objective checklist" behavior. In all cases, the change in the behavior from baseline to intervention, on the average, was also the "achieved level" because no "objective checklist" behavior occurred in the baselines of any Intern.
Visual Inspection of the graphs (see Figures 5, 6, 7, 8, 9, and 10) reveals the following:

1. The "objective checklist" behavior for Intern 5 is an example of what could happen if the intern did not receive written suggestion, feedback, or exposure to a model who modeled the desired behavior. The intern's checklist behavior remained at 0.0 throughout the entire study.

2. While the "checklist" behavior was acquired by all experimental interns, it was only maintained for the duration of the study by 11.

3. Intern 2's adoption of the "objective checklist" was delayed by the cooperating model teacher who chose not to introduce this behavior until the second last observation of the school year and then chose not to model the behavior for the last observation. It was therefore impossible to assess the lasting effects for Intern 2.

4. Intern 3 fluctuated from achieving to not achieving the "checklist" behavior depending on the performance of cm3.

5. Intern 4 from the control group demonstrated a significant change which lasted for two observations.

6. Intern 6 acquired and maintained the behavior throughout the intervention phase (seven observations).

In summary, it could be suggested that modeling produces more lasting effects on "objective checklist" behavior because in each study only when the model neglected to model the behavior was the intern's performance not maintained.

The final behavior which was common to the experimental and
control interns was "non-descriptive cue for a demonstration". Table 10 indicates that 13 achieved a level of 2.0 throughout the intervention phase while 15 achieved a level of 1.1. Both of these levels were also representative of the average change between baseline and intervention.

Visual Inspection of the graphs (see Figures 7 and 9) reveal that, the change in "non-descriptive cue for a demonstration" was significantly more rapid for 15 than for 13. However cm3 did not model criterion levels of the behavior until the fourth session after the initial intervention. Cooperating teacher five was also cm3 therefore both interns (13 and 15) received their written suggestions and feedback from the same person. One possible explanation for these results is that the model for 13 is so powerful it can negate the impact of incongruent written suggestions and feedback.

Once again the experimental intern's behavior was significantly more lasting than the control intern's behavior. Intern 3 maintained "non-descriptive cues" for seven of the observations following intervention, while 15 only maintained "non-descriptive cues" for four of the twelve observations following intervention. On the other hand from the results of 15 one could suggest (see Figure 9) that written suggestions and feedback are so powerful they negate the impact of the model?

Results and discussion of behaviors unique to either the experimental or control interns

Two behaviors that were unique to the control intern 4 were "positive interactions" and "selective attention demonstrations". The
discussion of the average scores for these behaviors (see table 9) occurred in the discussion of Question 2. The graph (see Figure 8) for "positive interactions" reveals that although the instances of this behavior were minimal they were maintained throughout the study and appeared to follow, even in baseline, the behavior of m4. The instances of "selective attention demonstrations" also occurred in baseline and, like the "positive interactions", seemed to follow the behavior of m4. Following intervention this behavior showed an insignificant change from 0.0 to 1.0 instance however the frequency immediately returned to zero and remained there for the last five observations. It appears that the dimensions of the two behaviors were determined by the model's behavior rather than by the intervention of written suggestions and feedback.

"Prompt-observe-feedback" and "vantage point" behaviors were exclusively displayed by 11 and 12. These behaviors have been extensively discussed in Question 1 and 3. Therefore the purpose for their inclusion in this discussion is to visually perceive the degree of relationship between the model and the Intern. For both behaviors of 12 and 11 there is a highly significant relationship between the trend and shape of the respective Intern graphs and the graphs of their model teacher. Particularly for 12 where the two graphs, one of 12 and the other of cm2 are almost "mirror images" of each other.

Despite the obvious departure in the frequencies of 11 and cm1 at the beginning of intervention for "vantage point" behavior the trends are almost identical.

These findings lend a great deal of support to the notion that the
model is one of the most powerful if not the most powerful effector of behavior change, when compared to written suggestions and feedback.

Finally there were two of I4's behaviors also in the study of Intern 6. One was "positive interaction" behavior while the other was "selective attention demonstration" behavior. The "positive interaction" behavior of I6 would seem to contradict the impressions gained from the analysis of the data so far. While observing the graph (see Figure 10) two factors need to be considered. Firstly the Intern was not given written suggestions or feedback and therefore would not be capable of discriminating this behavior from other behaviors unless it had obvious and unique characteristics. Secondly "positive interactions" are very similar to praise and positive feedback and therefore would pass unnoticed if only one to three instances occurred in a 30 minute lesson. It is not surprising to find therefore that the Intern did not imitate this behavior.

The "selective attention demonstration" behavior displayed in Figure 10 by Intern 6 reveals an interesting interaction between the model and the Intern. The Intern's baseline behavior not only varies greatly from that of the model (c m6) but is also at times close to the criterion level for "selective attention demonstration". However the modeling process seems to be so effective in this instance that, when c m6 makes a poor attempt to model the criterion and only achieves one third of required frequencies during intervention, I6's performance deteriorates until it eventually "mirrors" the behavior of c m6.

Apart from one or two exceptions the analysis of the experimental interns and control interns supported the conclusion that modeling,
either on its own (Intern 6) or in combination with written suggestions and feedback (Intern 1, 2, and 3) effected more rapid, substantial and lasting changes in intern behavior than verbal instructions and feedback without modeling.

Summary

This chapter has dealt with the analysis and discussion of the data. Firstly it was established that the data were "good" data and confirmed that the observation system was a reliable source of data and that sufficient inter-observer agreements of 80 percent or more were obtained to adequately monitor the accuracy and reliability of the observers.

Secondly the chapter attended to the four research questions by providing a discussion of each of the subjects and the behaviors that were associated with the investigation of a particular question.
CHAPTER FIVE
SUMMATION OF THE STUDY

This chapter presents conclusions based on the results of intervention studies of physical education interns. The chapter concludes with recommendations for further study of modeling as an effector of change in the teaching behavior of training interns.

A Review of the Study

The purpose of the study was to investigate the effect of a physical education cooperating teacher's modeling of specific teaching behaviors on the incidence of those teaching behaviors in a physical education intern.

There are certain characteristics of modeling which affect imitation. The degree to which an observer imitates the model is dependent upon: a) how closely the observer attends to the model; b) the ability of the observer to discriminate the appropriate behavioral cues; c) the degree of likeness between the characteristics of the model and the characteristics of the observer; d) the perceived characteristics of the behavior being modeled, for example, whether or not the behavior is beyond the capabilities of the observer; e) the application of vicarious or direct rewards and punishments; and f) the amount of control and organization associated with the directions given to, or provided for, the observer.

Teachers, coaches, trainers, parents and other accepted educators typically employ, consciously or unconsciously, many of the above
characteristics of modeling when giving a demonstration to their students. The demonstration usually depicts the most effective way of achieving the desired result according to the knowledge and expertise of the model.

A demonstration is an effective strategy in teacher education to identify and present components of the most effective teaching behaviors. Recently many of the effective teaching behaviors, in terms of student achievement, were identified by the Beginning Teacher Evaluation Study (BTES). "Some of these include feedback skills, diagnostic skills, and the ability to keep students engaged with academic materials" (Birdwell, 1980, p. 95).

Physical education teacher education literature indicates that it is possible to adopt the research methods and findings of the BTES to the gymnasium and develop interventions which effect changes in the teaching behavior of physical education interns. Investigations have necessarily based their decision to use certain teaching behaviors, as dependent variables, on the impact on those behaviors on ALT-PE, a student process variable which is an effector of student achievement.

Classroom investigations have employed modeling as either an independent intervention or as part of a multifaceted intervention to effect teacher behavior. The review of literature, while supportive of the effect of modeling on intern teaching behavior in the classroom, is limited. The general acceptance of the existence and impact of the modeling process, combined with the search for more effective teaching intern training methods, certainly warranted the investigation of modeling in this study.
The first phase of the study was a pre-study descriptive analysis of the teaching behaviors that manifested themselves in the non-treated repertoires of the Interns and model teachers involved in the study. Four behaviors were identified for each intern and model teacher as requiring change. The accuracy of the operational description of each behavior was obtained as the result of discussions between three experienced teachers.

Phase two of the study involved the collection of data in five elementary physical education settings. The settings and their teachers were chosen because of the experimenter's familiarity with them. Interns were randomly assigned to the five gymnasium settings with one intern at each of four settings and two interns being placed at the other setting. Teachers were either a cooperating teacher, model teacher, or both, depending upon the organization of the intern's commitments by the heads of the respective physical education departments.

Interventions were conducted separately and sequentially on each of the four targeted teacher behaviors of each intern and experimental model teacher. Throughout the study 208 physical education lessons, of K to 6 grades were observed. These included the pre-study observations and did not include eight lessons which were postponed due to an absence of the teacher or intern or due to school disruptions.

The third phase of the study involved the establishment of observer reliability. Observers were trained to accurately discriminate and record the target behaviors. There were 319 reliability checks which established the utility of the data for each behavior of
each subject during all phases of the investigation. Eighty-six percent of all individual event nominal agreements met or exceeded the criterion limits established prior to data collection.

The final phase of the study incorporated descriptive statistics to analyze the data. Multiple baseline graphs (across behaviors) means, and differences between means were the basis of the investigation of each of the four research questions designed to simplify and organize the purpose of the study.

Conclusions

The conclusions of this study are categorized according to the four research questions.

The following are conclusions emanating from the analysis of the data pertaining to Question 1: Would a systematic intervention including verbal suggestions, feedback, and modeling effect a significant change in intern behavior?

1. Intervention B, consisting of written suggestions, feedback given twice in the intervention week only, and modeling was successful in producing clinically significant changes in seven of the 12 target behaviors of the experimental interns.

2. Intervention B was successful in effecting a substantial change in 11 of the 12 target behaviors of the experimental interns.

3. The model's achievement of criterion levels for each target behavior greatly effected the intern's similar performance on those behaviors. Of five of the behaviors which did not reach criterion levels for the interns the model did not achieve criterion in four of them. Of the seven intern behaviors which reached the criterion the
model achieved criterion in five. For the two "non-criterion" model behaviors, that were criterion for the Intern, the criteria were 10 and 40 and the model performed on the average 9.2 and 39.3 instances respectively. For the one behavior in which the model achieved criterion and the Intern did not achieve criterion the changes in instances of the behavior were +2.9 and +2.2 respectively.

4. It is therefore concluded, for the Interns in the experimental group of this study, that the systematic intervention of verbal suggestions, feedback, and appropriate modeling was successful in effecting a clinically significant and substantial change in their teaching behavior. It is also concluded that the characteristics of the behavior of the model were instrumental in determining the degree and direction of the change in the Intern's teaching behavior.

The following are conclusions emanating from the analysis of data for Question 2: Would a systematic intervention including verbal suggestions and feedback effect a significant change in an Intern's teaching behavior if the model teacher or cooperating model teacher did not model the target behavior?

1. Intervention A consisting of written suggestions, feedback given twice during intervention week only, and a model who did not model the target behaviors was successful in producing clinically significant changes in only one of the eight target behaviors of the control Interns.

2. Intervention A was successful in effecting a substantial initial change in four of the eight target behaviors, however, in none of these behaviors was the change lasting for the control Interns.
The first phase of the study was a pre-study descriptive analysis of the teaching behaviors that manifested themselves in the non-treated repertoires of the Interns and model teachers involved in the study. Four behaviors were identified for each Intern and model teacher as requiring change. The accuracy of the operational description of each behavior was obtained as the result of discussions between three experienced teachers.

Phase two of the study involved the collection of data in five elementary physical education settings. The settings and their teachers were chosen because of the experimenter's familiarity with them. Interns were randomly assigned to the five gymnasium settings with one Intern at each of four settings and two Interns being placed at the other setting. Teachers were either a cooperating teacher, model teacher, or both, depending upon the organization of the Intern's commitments by the heads of the respective physical education departments.

Interventions were conducted separately and sequentially on each of the four targeted teacher behaviors of each Intern and experimental model teacher. Throughout the study 208 physical education lessons, of K to 6 grades were observed. These included the pre-study observations and did not include eight lessons which were postponed due to an absence of the teacher or Intern or due to school disruptions.

The third phase of the study involved the establishment of observer reliability. Observers were trained to accurately discriminate and record the target behaviors. There were 319 reliability checks which established the utility of the data for each behavior of
1. Intervention B was successful in effecting a rapid (rapid being a substantial change during week one of intervention) change in nine of the 12 target behaviors of the experimental interns.

2. Intervention B was successful in effecting a substantial (substantial meaning either the achievement of clinically significant criteria or a clinically significant change which does not depend on the achievement of criteria) change in 11 of the 12 target behaviors of the experimental interns. In the other behavior there was a non-significant change toward criterion.

3. A lasting (lasting being the maintenance of the initial substantial change through each phase following the intervention on a particular behavior) change was successfully effected by Intervention B for eight of the 12 behaviors. In the four behaviors where the change was not maintained the modeling component of Intervention B was deficient. In fact in these four cases the Intern closely imitated the deficient performance of the model.

4. It is therefore concluded that, for the interns in the experimental group of this study, the systematic intervention of verbal suggestions, feedback, and appropriate modeling was successful in effecting rapid, substantial, and lasting changes in their effective teaching behaviors.

The following are conclusions emanating from the analysis of the data for Question 4: Does modeling effect more rapid, substantial, and lasting changes in intern behavior than verbal suggestions and feedback?

1. The modeling of appropriate teaching behavior either combined
with written suggestions and feedback (13) or on its own without written suggestions and feedback (16) was more successful in effecting rapid, lasting and substantial changes in "no-repeats" behavior than were written suggestions and feedback combined (14 and 15).

2. The modeling of appropriate teaching behaviors combined with written suggestions and feedback (11, 12 and 13) was more successful in effecting rapid, substantial and lasting changes in "voice enthusiasm" than were written suggestions and feedback combined (15).

3. The criteria used to compare the performance of the "objective checklist" by the Interns were: a) whether or not the behavior occurred, that is, the Intern recorded one or two objectives for each child; and b) how lasting (number of lessons following intervention that the behavior criteria were maintained) was the behavior. Intervention B was more successful in effecting the occurrence and maintenance of the "objective checklists" behavior than was Intervention A.

4. A comparison of the experimental Intern (13) with the control Intern (15), using the "non-descriptive cue for a demonstration" behavior as the common catalyst for comparison, revealed that: a) Intervention A was more successful in effecting a rapid change in the behavior; b) Intervention B was more successful in effecting a somewhat deficient representation of a lasting effect; and c) both interventions were successful in effecting a substantial change in the "non-descriptive cue for a demonstration" behavior.

5. When considering those behaviors that were unique to either the experimental Interns or control Interns the conclusions for the six
behaviors were that Intervention B was more successful in effecting rapid, substantial and lasting changes for the four unique teacher behaviors in 11 and 12 than was Intervention A for the two unique behaviors in 14.

6. Intern 6 provided two examples and Intern 5 one example of teaching behaviors that changed in the absence of both interventions. All that was available for these three behaviors was an inappropriate model. When written suggestions, feedback and an appropriate model were not used Interns 5 and 6 either imitated the inappropriate model or did not produce any instances of the behavior.

7. It is therefore concluded that, for the Interns in this study Intervention B (suggestions, feedback and model) was substantially more successful in effecting rapid, substantial and lasting changes in teaching behaviors than was Intervention A (suggestions, feedback, and an inappropriate model).

This study demonstrated that the modeling of effective teaching behaviors by cooperating teachers resulted in the accurate imitation of those behaviors by the training interns. Modeling could therefore be a successful and cost effective method for changing teacher behavior. The effect of written suggestions and feedback used in this study was minimal and often seemed to be negated by the modeling process. A word of warning is needed here. There are studies which show conclusively that instructions and feedback can successfully effect an intern's teaching behavior in physical education (Birdwell, 1980). However, these studies necessarily employ elaborate and controlled behavior change strategies which require constant monitoring, recording and
self-evaluation. Because of time constraints, tasks like these are rarely extensively used as part of a cooperating teacher's training program for their intern in the field.

The experience of the experimenter has been that cooperating teachers only occasionally observe the intern teach, and when they do, the analysis is invariably a subjective summary entered on to the bottom of the intern's daily lesson plan. Therefore, the written suggestions and feedback in this study were entitled "standard intern training" because their structure closely resembled the typical intervention strategy employed by cooperating teachers in physical education.

It was found in this study that the modeling process was substantially more effective at changing the teaching behavior of the interns than was the typical intervention of written suggestions and feedback.

Unfortunately, the need to remove a teacher from the control group, because of his administrative commitments and subsequent inability to perform the demands of the study, reduced the number of available control replications in this study. Effectively, there were three replications of the experimental condition and two replications of the control conditions. What was to be the third control condition was not abandoned completely. The subjects in this control condition were investigated using a systematic replication which contained elements of both the control and experimental conditions. In many ways this enhanced the analysis and discussion of the data and certainly supported the findings for the other five interns.
The findings in this study seem to refute the notion expressed by Verabloff (1983) that, "Teacher behavior does not change by just watching someone else teach. It is necessary to specify behavioral objectives and provide feedback on progress made in attaining those objectives (Rife, 1973; Boehm, 1974; Darst, 1976)" (p. 55). There were several instances in this study where the intern's behavior changed substantially by "just watching" the model teacher. Obviously there is a need to clarify what constitutes the behavior of "just watching" before more definitive statements can be made about which intervention strategy incorporating modeling, would be most effective in physical education intern training.

Recommendations

The primary intervention in this study was effective in helping interns acquire and maintain desirable teacher effectiveness behaviors. However, it is recommended that:

1. The experimenter spends more time with the model teachers to ensure that the target behaviors are modeled accurately, according to the criterion, on every occasion that the intern selectively attends to the model's behavior.

2. College supervisors or researchers, in consultation with model teachers, need to develop observation coding sheets which fit the requirements of a particular intern as well as the ecology of the gymnasium. It was noticeable that, in this study, the teachers were tentative about the value of introducing a "checklist" to the already demanding teaching setting. One teacher postponed its adoption until it was almost too late to measure a change due to the independent
variable. Another teacher failed to incorporate the checklist in their written suggestions and feedback. A closer liaison between the college supervisor and the cooperating/model teacher would help to overcome these situations.

3. Model teachers in the control condition need to be informed about the behaviors they are to avoid even though the pre-study data would indicate that the behaviors are not in their repertoire. It was found in this study that certain behaviors, in individual teachers, can be dormant until an appropriate stimulus appears. This phenomenon is totally dependent upon the stimulus/response relationship. Some behaviors did not occur in the control models for five weeks. When they did occur there were generally rapid and substantial increases in their frequencies. To avoid this situation occurring in an investigation the experimenter needs to keep the model teacher informed about their role and its importance in relation to the overall results and also extend the pre-study to include several weeks of observation of the model in as many teaching situations as possible (large/small classes, indoor/outdoor, morning/afternoon, various activities, kindergarten to year 6, etc.).

4. Observers should avoid breaks of longer than two to three days between the successive coding of videotapes. Invariably when long breaks occurred in this study there was a reduction in nominal interobserver agreement.

5. More than the number of required subjects should be included in the study to safeguard against the advent of school disruptions and teacher absences.
6. It was originally intended in this investigation to conduct three separate single-case experimental studies whereby one control intern was compared with one experimental intern in three mini studies. The subjects were paired according to the similarity between their target behaviors. Unfortunately, as has been mentioned, several unavoidable incidents resulted in the re-structuring of a portion of the study. Although it is not possible to account for and control all the possible disruptions in every school, precautions can be taken to ensure that the experimenter is prepared for at least the planned disruptions.

7. The use of the same behaviors for the control and experimental intern would render the raw data receptive to a greater variety of descriptive and statistical analyses. Having a choice of statistics would mean that the most concise and informative statistics could be chosen to analyze the data.

8. A written script needs to be developed for the experimenter in this type of study so that the communications with each intern and cooperating/model teacher are consistent.

9. An accountability mechanism, over and above the "experimenter checks", needs to be individualized for each cooperating and model teacher to ensure that their attention to the administering of written suggestions, feedback and modeling is reinforced.

10. Further study should now be directed toward investigating the following:

   a. How many behaviors of specific complexity and inference can be comfortably acquired by an intern, using the modeling approach to intern training, during a 10 week teaching practice?
b. What characteristics of the model teacher effect the most rapid, substantial and lasting changes in the Intern's effective teaching behavior? How many times a week does the Intern need to see the model for optimal imitation to occur? Is it possible to develop changing criteria which are sequentially introduced by the model and act as enabling objectives for the overall behavioral goal.

c. How do cooperating teachers react to the notion of having to model effective teaching consistently throughout the Intern teaching practice?

d. What kinds of assessments of Interns are possible when modeling is the major teaching tool? For example, does the Intern receive an "A" if he accurately imitates the model teacher when the model teacher does not model the criterion required to result in effective teaching?

e. What is the impact of the modeling process on the acquisition of appropriate teaching behaviors in many varied settings for an increasing number of subjects? Such an investigation would enhance the generic implications of the findings of this study.

A Final Note

This study has been the initial step in a series of similar investigations which could strengthen the case for the careful screening and training of cooperating/model teachers. The revenue to fund such a project would necessarily come from colleges no longer needing to employ college supervisors in their present role.

The power of the model teacher to influence the training Intern is obvious in this study. It seems logical to try to stimulate the growth of this efficient teaching tool. One way would be to offer incentives to select cooperating teachers to become examples of what we are beginning to know is an effective teacher.

Many inappropriate teaching behaviors have been manifested in the teaching profession because, unfortunately, training interns have been exposed, as children and as professionals, to poor teaching and have
imitated what they thought was competent teaching. Colleges send interns to the schools to gain invaluable experience. Why wouldn't the intern assume that he is being sent to observe and work with "the best" teachers and consequently imitate what he observes. After all in most gymnasiums the children appear to be well behaved?

The contention is that, as in other professions (medicine, dentistry, law), a supervisor from the college should only be required to assist with intern practical training if there is concern for the efficacy of the practical training environment. The colleges of medicine, dentistry and law have eliminated the need for supervisors because of the high quality of their models in the practical setting. The teaching profession should strive for this type of college/teacher relationship.
BIBLIOGRAPHY


175


Pieron, M. (1980) *From interaction analysis to research on teaching effectiveness: An overview of studies from the University of Liege.* Unpublished paper, Department of Physical Education, The Ohio State University, Mimeo.


Westcott, W.L. (1979b) *Increasing teacher effectiveness through peer modeling and reinforcement*. Unpublished manuscript, The Ohio State University, Physical Education Teacher Education Department, Columbus.


PERSONAL COMMUNICATION

Sledentop, D.S., July 25, 1984
APPENDIX A
Title of Research Proposal
The Influence of a Cooperating Teacher's Modeling of Effective Teaching Behavior on the Teaching Behavior of a Student Teacher in Physical Education.

Submitted by: Name: Brian Douge
Columbus Address: Vi6A/1170 Chambers Road, Columbus, Ohio 43212
Campus Address: Pomerene Hall, 1760 Neil Avenue, Ohio State University
Telephone: Campus - 422-8364 Home - 486-9076

Graduate Advisor: Dr. Daryl Stedentop

Outline:
1. Problem Statement
The purpose of the study is to assess the nature of change in a student teacher's teaching behavior due to live exposure to specific effective teaching behaviors being modeled by a cooperating teacher in physical education.

2. Methodology
A. Population - The population will be six cooperating teachers in elementary physical education and their allocated student teachers. Three teachers will comprise the experimental portion of the study while the other three will function as comparisons.

B. Design - Single case multiple baseline design (Herson & Barlow, 1971)

C. Data and Instrumentation - Data will be collected using a modified version of the Anderson (1974) Descriptive System. The modifications are based on the 1982 revision of the Hough-Observation System for Instructional Analysis. Essentially, the data will be duration and frequency recordings of teacher behavior. A copy of the instrument can be found in What's Going On In Gym (Anderson, William G., & Barrette, Gary T., 1978).

D. Analysis - Analysis will be accomplished using graphical presentations of the quantities (frequency and duration) of specific effective teaching behaviors as they are manifest in the cooperating teacher and student teacher.

Data will be collected using videotape recording procedures.

3. Time Schedule
Total time - 10 weeks
Commence - March 27th
Frequency - each teacher will be observed a minimum of two times each week

*Please note that the above research will be conducted within the scheduled framework of student teaching practice for those student teachers majoring in physical education.
RESEARCH PROSPECTUS

TITLE: The Effect of a Cooperating Teacher's Modeling of Specific Teaching Behaviors on the Teaching Behavior of a Physical Education Student Teacher

WHAT WE KNOW:

- Cooperating teachers have a significant impact upon the teaching behaviors of student teachers (interns).
- The ecology of the gymnasium and the school modifies the teaching behavior of the intern.
- Behaviors are learned through imitation of social models.
- Certain factors, characteristics of the model, characteristics of the behavior, reinforcement of the observer and/or model, and level of observer attention determine the power of a model to cause imitation.
- Imitation is more likely to occur if the required behaviors are modeled by different models.
- In reading and social studies, intern teaching behavior is significantly changed by either written instructions, video models, live models, or contingency mechanisms (e.g., college grade) with live models being the most powerful intervention strategy.
- Certain teaching behaviors are indicative of more effective teachers.
- There is considerable concern for the cost-effectiveness of intern training programs, particularly in relation to the
supervision of student teaching practice.

NEED FOR STUDY:
To confirm that the effect of the cooperating teacher model, which has been shown to exist in other disciplines, exists in the physical education domain. Such a finding would add impetus to the notion that interns should be exposed to cooperating teachers who consistently employ the most effective behaviors.

RESEARCH QUESTIONS:
1. Does the modeling of desired teaching behaviors by a cooperating teacher, when combined with written instructions of the same teaching behaviors, increase the presence of those behaviors in an intern?
2. Does the intervention of written instructions increase the presence of desired teaching behaviors in an intern?
3. Does the combination of written instructions and cooperating teacher modeling cause greater and more lasting changes in intern teaching behavior than written instructions?

PROCEDURES:
* Sample. Six elementary P.E. teachers from the Dublin and Grandview Heights school districts and six interns who have been assigned to these teachers, according to the normal process of student teacher allocation.

Three teachers will be randomly assigned to each of the control (instruction only) and experimental (instruction plus
modeling) conditions.

* Design. Multiple baseline design will be used to show that behaviors change when they come under control of instruction and/or modeling.

A comparison of instructions with modeling can be achieved by analyzing the graphs for the immediacy of change following intervention, the magnitude of change, the maintenance of change, and how quickly criterion is achieved.

* Data will be collected using systematic observation of the desired teaching behaviors, using event and duration recording, and will be analyzed using graphical analysis.

* Time Schedule:
  
  Week 1. Familiarization of classes with video equipment.
  Weeks 2 and 3. Baseline of intern and teacher behavior.
  Weeks 4 to 8. One intervention each week.
  Weeks 9 and 10. Maintenance.

* Interventions:
  
  1. Increase active supervision (monitoring).
  2. Increase the number of reactions to student responses to teacher solicitations.
  3. Increase goal-referenced corrective and positive feedback.
  4. Increase auditory-visual feedback and demonstrations to the class, group and individual.
  5. Increase concurrent and terminal feedback.
  6. Decrease transition time by employing teaching strategies to bring about change (routines).
  7. Increase the amount of enthusiasm, i.e. the number of hustles and prompts.
8. Increase the use of positive interaction without the use of misbehavior cues.

9. Increase non-verbal positive interactions.
Columbus, Ohio 43212

Dear:

What I am writing about is to warn you that I have approached the Grandview Heights superintendent to obtain permission to conduct research (see enclosed prospectus) in your elementary school with you and

The powers to be at O.S.U. insist that the schools first offer their staff and students before individual teachers are approached to participate in a study. However, I will need to begin my investigation on March 27th and fear that the administrative wheels will turn too slowly for me to have time to wait to be given permission to contact you.

Essentially, the study would fit into the normal student teaching format. The only differences would be the need to possibly videotape both the student teacher and their cooperating teacher a minimum of twice each week and the need to systematically alter some of the teaching behaviors of either you or

There is no intention to alter the physical education program or to encroach upon the cooperating teacher/student teacher dyad.

The enclosed prospectus has been forwarded to the superintendents of the elementary schools. Hopefully, they will encourage the principals to accept the concept.

Fundamentally, what I propose to reveal is that a student teacher's teaching behavior is more effectively changed if the cooperating teacher models the behavior and provides written instructions than if a cooperating teacher merely offers verbal instructions without the accompanying live model.

The study would ideally be the first in a series of investigations which will provide the necessary evidence to show that teachers in the schools,
who model the required effective teaching behavior, are the most powerful source of appropriate behavior change in teacher education and should, therefore, be afforded greater consideration in terms of selection and assistance.

Hopefully, the above clarifies my intentions. If not, please do not hesitate to contact me at home (486-9076) or at work (422-8584). Be assured that the investigation will not alter the normal operation of student teaching and, in fact, in some instances there will hopefully be a more sophisticated input from the college supervisor (that's me!).

Whatever your decision, I look forward to working with you again and sharing an enthusiasm for physical education.

All the best,

Brian Douge
Teaching Associate

BD/cls

P.S. The student teachers will not be aware of their involvement in the study until after the collection of all data.
LETTER TO HEAD OF PHYSICAL EDUCATION DEPARTMENT

The Ohio State University
School of Health, Physical Education and Recreation
1760 Neil Avenue
Columbus, Ohio 43210-1221

February 29, 1984

Dublin, Ohio 43017

Dear :

Thank you for returning my texts. I am still awaiting the arrival of your personal copies. The bookstore tells me that Daryl's text will be available next quarter?!

What I am writing about is to warn (?) you that I have approached the Dublin School District to obtain permission to work (research) with three of your elementary physical education staff. The powers-to-be at O.S.U. insist that the schools first offer their staff and students before individual teachers are approached to participate in a study. However, I will need to begin my investigation on March 27th and fear that the administrative wheels will turn too slowly for me to have time to wait to be given permission to contact you and your staff.

So, other than a good excuse to communicate with my favorite cooperating teacher, the purpose of this note is to ask if your program could tolerate the presence of a researcher disguised as a supervisor? Essentially, the study would cause only minor adjustments to the normal student teaching format. None of which would effect your program in the elementary or high schools. The major differences will be the possible need to videotape both the cooperating (elementary only) physical education teachers and their student teachers at a minimum of twice each week and the need to systematically alter some of the teaching behaviors of one or two of the cooperating teachers on your elementary staff.

Enclosed is a copy of the research prospectus highlighting the major features of the study. A copy has also been forwarded to the District superintendent and the superintendent of elementary schools, the other school system in my study.

College of Education
Fundamentally, what I propose to reveal is that a student teacher's teaching behavior is more effectively changed if the cooperating teacher models the behavior and provides written instructions than if a cooperating teacher merely offers verbal instructions without the accompanying live model. The study would ideally be the first in a series of investigations which will provide the necessary evidence to show that the teachers in the schools, who model the required effective teaching behavior, are the most powerful source of behavior change in teacher education and should, therefore, be afforded greater consideration in terms of selection and assistance.

Hopefully, the above clarifies my intentions. If not, please do not hesitate to contact me at home (486-9076) or at work (422-8584). Please be assured that the investigation will not alter the normal operation of student teaching and, in fact, in some instances there will hopefully be a more sophisticated input from the college supervisor (that's me!). Whatever your decision, I look forward to working with you again and sharing an enthusiasm for physical education.

All the best,

Brian Dough
Teaching Associate

P.S. The student teachers will not be aware of their involvement in the study until after the collection of all data.
APPENDIX C
March 27, 1984

To: Teacher Education Staff

From: Brian Douge

- Desperately need assistance with data collection in exchange for free instruction on how to use camera equipment and experience in the field, collecting data.
- Also need assistance with coding for those interested in teaching behavior.
- Please indicate in the appropriate time slot if you can possibly assist with videotaping.

Key: * - most important time slots (need two operators)
   G - Grandview Schools
   D - Dublin Schools
   - Return the timetable to my pigeon hold if you can assist.

<table>
<thead>
<tr>
<th>MONDAY</th>
<th>TUESDAY</th>
<th>WEDNESDAY</th>
<th>THURSDAY</th>
<th>FRIDAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00</td>
<td>D</td>
<td></td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>8:30</td>
<td></td>
<td>G</td>
<td>G</td>
<td></td>
</tr>
<tr>
<td>9:00</td>
<td>D</td>
<td></td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>9:30</td>
<td></td>
<td></td>
<td>G</td>
<td></td>
</tr>
<tr>
<td>10:00</td>
<td></td>
<td></td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>11:00</td>
<td></td>
<td></td>
<td>G</td>
<td></td>
</tr>
<tr>
<td>11:30</td>
<td></td>
<td></td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>12:00</td>
<td></td>
<td></td>
<td>G</td>
<td></td>
</tr>
<tr>
<td>12:30</td>
<td></td>
<td></td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>1:00</td>
<td></td>
<td></td>
<td>G</td>
<td></td>
</tr>
<tr>
<td>1:30</td>
<td></td>
<td></td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>2:00</td>
<td></td>
<td></td>
<td>G</td>
<td></td>
</tr>
<tr>
<td>2:30</td>
<td></td>
<td></td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>3:00</td>
<td></td>
<td></td>
<td>G</td>
<td></td>
</tr>
<tr>
<td>3:30</td>
<td></td>
<td></td>
<td>G</td>
<td></td>
</tr>
</tbody>
</table>

College of Education
APPENDIX D
## Definitions of Teaching Behaviors

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solicitation-Response-Reactions (SRR)</td>
<td>Teacher solicits a student response (SRR) and then reacts with praise or feedback.</td>
</tr>
<tr>
<td>Response-Reaction (RR)</td>
<td>Student initiates a response that is verbal or physical and the teacher reacts with praise, punishment, acknowledgment or feedback.</td>
</tr>
<tr>
<td>Concurrent Feedback (CnF)</td>
<td>Teacher gives feedback while the student is performing a task.</td>
</tr>
<tr>
<td>Terminal Feedback (TF)</td>
<td>Teacher provides feedback after the task has been completed and the student is inactive.</td>
</tr>
<tr>
<td>Positive Interaction With A Misbehavior Cue (PIC)*</td>
<td>Teacher interacts positively with a student for emitting an acceptable behavior, which is incompatible with the misbehavior of another student, preference to criticizing the misbehaving student.</td>
</tr>
<tr>
<td>Corrective Feedback (CoF)</td>
<td>Teacher offers a suggestion to correct an inappropriate component of a movement or skill.</td>
</tr>
<tr>
<td>Goal-Referenced Feedback (GF)</td>
<td>The feedback from the teacher relates to a goal of the lesson.</td>
</tr>
<tr>
<td>Audio-Visual Feedback (AF)</td>
<td>Teacher provides the student with a physical demonstration of what the student did in their performance. The demonstration is accompanied by verbal comment and may highlight correct or incorrect components of the student's performance.</td>
</tr>
<tr>
<td>Prescriptive Feedback (PF)</td>
<td>Feedback from the teacher contains elements emphasizing ways to correct inappropriate elements of performance or maintain appropriate elements.</td>
</tr>
<tr>
<td>Extension Feedback (EF)</td>
<td>Teacher provides feedback which contains ways of developing or extending the task.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Positive Feedback (PoF)</td>
<td>Teacher reactions to those tasks or components of tasks that the students do well. It can be general or specific.</td>
</tr>
<tr>
<td>Positive Specific Feedback (PSF)</td>
<td>Teacher offers feedback to the student about specific skill components that are performed well.</td>
</tr>
<tr>
<td>Transitional Cue (TC)</td>
<td>A cue from the teacher which initiates a student transition to another activity or position in the gymnasium.</td>
</tr>
<tr>
<td>Descriptive Cue for Transition (DCT)</td>
<td>Teacher describes to the students the nature of their transition to another activity or position in the gym.</td>
</tr>
<tr>
<td>Hustles (H)</td>
<td>Brief comments or actions which encourage more on task behavior. They tend to motivate the students into action.</td>
</tr>
<tr>
<td>Prompts (P)</td>
<td>Reminders given to students about expected behavior. The behavior has previously been initiated in teacher instructions.</td>
</tr>
<tr>
<td>Desists (D)</td>
<td>A forceful request for a student to stop undesirable behavior.</td>
</tr>
<tr>
<td>Prompt-Observe-Feedback (P-O-F)*</td>
<td>Teacher prompts the student(s) then observes the performance of the prompt objective and offers immediate feedback about the performance.</td>
</tr>
<tr>
<td>Non-Verbal Interaction (NVI)</td>
<td>Teacher interacts physically with a student using informative signs or physical guidance and encouragement.</td>
</tr>
<tr>
<td>Non-Substantive Interaction</td>
<td>The interaction between the student (NSI) and teacher is not related to the substance of the lesson.</td>
</tr>
<tr>
<td>≤ 4 - Bits of Information (≤4B)</td>
<td>Instructions or feedback given to students contains four or less bits of information.</td>
</tr>
<tr>
<td>&gt; 4 - Bits of Information (&gt;4B)</td>
<td>Instructions or feedback given to students contains greater than four bits of information.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>----------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Giving Directions (G)</td>
<td>Teacher directs, verbally or non-verbally, the student(s) to perform a task.</td>
</tr>
<tr>
<td>Use Names (UN)</td>
<td>Teacher uses student's names when interacting with students during, before, and after the lesson.</td>
</tr>
<tr>
<td>Questioning (Q)</td>
<td>Teacher asks questions about content or procedures with the intent of obtaining a response. Rhetorical questions are not coded.</td>
</tr>
<tr>
<td>Repeat Answers (RA)*</td>
<td>Student responses are repeated by the teacher.</td>
</tr>
<tr>
<td>Review Content (RC)</td>
<td>Teacher reviews the lesson activities either at the end of the lesson or at the beginning of the next lesson.</td>
</tr>
<tr>
<td>Central Assembly (CA)</td>
<td>Students are solicited using a descriptive cue to come to a central assembly point in the gymnasium or field.</td>
</tr>
<tr>
<td>Set Expectations (SE)</td>
<td>Prior to the commencement of a task the teacher establishes the behavioral expectations. They can be substantive or non-substantive.</td>
</tr>
<tr>
<td>Answering Questions (AQ)</td>
<td>Teacher answers a student's or group of student's questions.</td>
</tr>
<tr>
<td>Listening (L)</td>
<td>Teacher listens to a student's response or question. The teacher must be silent for the full interval.</td>
</tr>
<tr>
<td>Officiating (O)</td>
<td>Teacher is actively refereeing a sport or game. Verbal behavior which entails rules, regulations or judgments about the sport or game should be coded officiating.</td>
</tr>
<tr>
<td>Punishment (P)</td>
<td>Specific penalties are imposed upon a student or group of student's for disruptive or off-task behavior.</td>
</tr>
<tr>
<td>Praise (Pr)</td>
<td>Teacher provides positive or supportive statements or gestures to a behavior episode unrelated to the performance of a motor skill.</td>
</tr>
<tr>
<td>Term</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Vantage Point (VP)*</td>
<td>Teacher adopts a position in the gymnasium from which he/she can actively supervise the entire class.</td>
</tr>
<tr>
<td>Voice Enthusiasm (VE)*</td>
<td>Teacher raises the voice when giving positive feedback and lowers the voice when giving instructions.</td>
</tr>
<tr>
<td>Monitoring (M)</td>
<td>Teacher is observing an activity without verbally interacting to the behaviors of individuals. The focus of the teacher must be directed toward the class at all times.</td>
</tr>
<tr>
<td>Active Supervision (AS)</td>
<td>Teacher monitors while simultaneously verbally reacting with students. Teacher can either be stationary or moving about the gymnasium.</td>
</tr>
<tr>
<td>Non-Descriptive Cue for A Demonstration (NOD)</td>
<td>The teacher emits a Transition Cue (TC) which solicits the student's response of moving to an assembly point from which all students can clearly see a demonstration to be given by the teacher or another student.</td>
</tr>
<tr>
<td>Objective Checklist (OC)*</td>
<td>Teacher carries a checklist of all the students names and one or two only specific lesson objectives. During the lesson the teacher focuses attention to the checklist and records the performance of each student.</td>
</tr>
<tr>
<td>Selective-Attention Demonstration (SAD)*</td>
<td>Teacher verbally previews two major elements of a skills and asks the students to attend to those elements in the subsequent demonstration. Students are then required to practice the two elements immediately following the demonstration.</td>
</tr>
<tr>
<td>Incorrect Demonstration (ID)</td>
<td>Teacher or student gives an incorrect skill demonstration. Incorrect according to the components suggested as correct by the teacher.</td>
</tr>
<tr>
<td>Change in Voice Tone (VT)</td>
<td>Teacher adds variety to his/her tone of voice.</td>
</tr>
<tr>
<td>Physical Guidance (PG)</td>
<td>Teacher physically guides a student through a movement or part of a complex movement.</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-----------------------------------------------------------------</td>
</tr>
<tr>
<td>No Repeats (NR)*</td>
<td>Teacher reacts to a student's answer to a teacher question by saying either &quot;That's right&quot;, &quot;Try again&quot;, &quot;Almost right&quot;, repeating answer in another content or reactions similar to these.</td>
</tr>
<tr>
<td>Smile (Sm)</td>
<td>Teacher smiles during the lesson.</td>
</tr>
<tr>
<td>Knowledge (K)</td>
<td>Teacher provides substantive knowledge either while lecturing, giving feedback or individually.</td>
</tr>
<tr>
<td>Superfluous Language (SL)</td>
<td>Teacher uses language which is superfluous.</td>
</tr>
<tr>
<td>Adjusts Equipment (AE)</td>
<td>Equipment is adjusted by the teacher either before, during, or after student activity.</td>
</tr>
<tr>
<td>Leading Exercises (LE)</td>
<td>Teacher leads the exercises from a &quot;Vantage Point&quot; (VP).</td>
</tr>
<tr>
<td>Talking to Self (TS)</td>
<td>Teacher is verbally talking to him/herself. The teacher is typically away from the students or speaks softly so that only he/she can hear.</td>
</tr>
<tr>
<td>Seeking Clarification (SC)</td>
<td>Following a student initiation, question or response the teacher asks them to clarify their comment.</td>
</tr>
<tr>
<td>Rhetorical Question (RQ)</td>
<td>Teacher asks a question to which the teacher does not expect or require an answer.</td>
</tr>
<tr>
<td>Acknowledgment (A)</td>
<td>Teacher acknowledges a student's response, initiation or question.</td>
</tr>
<tr>
<td>Managerial Behavior (MB)</td>
<td>Teacher is managing and organizing the students. The content is non-substantive.</td>
</tr>
</tbody>
</table>

* = Behaviors used as dependent variables in this study.
## PART D-2

### Pre-Study Observation Results

<table>
<thead>
<tr>
<th>Behavior</th>
<th>CH1</th>
<th>CH2</th>
<th>CH3</th>
<th>CH4</th>
<th>CH5</th>
<th>CH6</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRR</td>
<td>24</td>
<td>18</td>
<td>21</td>
<td>9</td>
<td>8</td>
<td>64</td>
</tr>
<tr>
<td>RR</td>
<td>11</td>
<td>7</td>
<td>10</td>
<td>12</td>
<td>15</td>
<td>7</td>
</tr>
<tr>
<td>CHF</td>
<td>13</td>
<td>15</td>
<td>5</td>
<td>6</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>TF</td>
<td>12</td>
<td>10</td>
<td>3</td>
<td>4</td>
<td>13</td>
<td>18</td>
</tr>
<tr>
<td>PIC*</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>CoF</td>
<td>7</td>
<td>5</td>
<td>0</td>
<td>4</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>GF</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>AF</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>P-F</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>EF</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PGF</td>
<td>14</td>
<td>12</td>
<td>20</td>
<td>15</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>PSF</td>
<td>19</td>
<td>24</td>
<td>11</td>
<td>15</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>TC</td>
<td>7</td>
<td>6</td>
<td>17</td>
<td>6</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>DCT</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>13</td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td>H</td>
<td>0</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>D</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>8</td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td>PO-FB*</td>
<td>4</td>
<td>8</td>
<td>0</td>
<td>5</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>NV1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>NSI</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>30</td>
<td>21</td>
<td>7</td>
</tr>
<tr>
<td>≤ 4B</td>
<td>21</td>
<td>28</td>
<td>25</td>
<td>21</td>
<td>17</td>
<td>20</td>
</tr>
<tr>
<td>&gt; 4B</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>G</td>
<td>27</td>
<td>30</td>
<td>26</td>
<td>30</td>
<td>27</td>
<td>26</td>
</tr>
<tr>
<td>UN</td>
<td>13</td>
<td>10</td>
<td>3</td>
<td>8</td>
<td>34</td>
<td>21</td>
</tr>
<tr>
<td>Q</td>
<td>15</td>
<td>8</td>
<td>9</td>
<td>12</td>
<td>18</td>
<td>14</td>
</tr>
<tr>
<td>RA*</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>RC</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>CA</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>SE</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>AQ</td>
<td>15</td>
<td>10</td>
<td>9</td>
<td>6</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>L</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>O</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>49</td>
<td>44</td>
</tr>
<tr>
<td>Pu</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Pr</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>VS</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>YE*</td>
<td>7</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>M</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>35</td>
<td>25</td>
</tr>
<tr>
<td>AS</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>35</td>
<td>25</td>
</tr>
<tr>
<td>NDD*</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>OC*</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Note:** The table above represents the pre-study observation results with various codes and values indicating different behaviors and measurements. The specific meanings of each code are not detailed in the provided text.
### Pre-Study Observation Results (CONTINUED)

<table>
<thead>
<tr>
<th>Behavior</th>
<th>CM1</th>
<th>11</th>
<th>CM2</th>
<th>12</th>
<th>CM3</th>
<th>14</th>
<th>M4</th>
<th>14</th>
<th>M5</th>
<th>15</th>
<th>C/M 6</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAD*</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>11</td>
<td>12</td>
<td>17</td>
<td>10</td>
<td>14</td>
<td>6</td>
<td>*0</td>
</tr>
<tr>
<td>ID</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>7</td>
<td>6</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>VT</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>9</td>
<td>11</td>
<td>8</td>
<td>8</td>
<td>17</td>
<td>12</td>
<td>3</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>PG</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>9</td>
<td>9</td>
<td>0</td>
<td>8</td>
<td>7</td>
<td>10</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>NR*</td>
<td>3</td>
<td>4</td>
<td>6</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>6</td>
<td>5</td>
<td>*0</td>
<td>1</td>
<td>*1</td>
<td>1</td>
</tr>
<tr>
<td>Sm</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>10</td>
<td>0</td>
<td>1</td>
<td>13</td>
<td>10</td>
<td>18</td>
<td>25</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>K</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>38</td>
<td>54</td>
<td>72</td>
<td>61</td>
<td>70</td>
<td>61</td>
<td>55</td>
<td>51</td>
</tr>
<tr>
<td>SL</td>
<td>1</td>
<td>2</td>
<td>7</td>
<td>5</td>
<td>1</td>
<td>0</td>
<td>18</td>
<td>15</td>
<td>38</td>
<td>24</td>
<td>42</td>
<td>31</td>
</tr>
<tr>
<td>AE</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>4</td>
<td>10</td>
<td>6</td>
<td>7</td>
<td>5</td>
<td>15</td>
<td>14</td>
<td>4</td>
</tr>
<tr>
<td>LE</td>
<td>6</td>
<td>5</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>TS</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>SC</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>6</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>RQ</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>8</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>10</td>
<td>5</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>A</td>
<td>8</td>
<td>15</td>
<td>11</td>
<td>10</td>
<td>7</td>
<td>7</td>
<td>4</td>
<td>3</td>
<td>13</td>
<td>7</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>MB</td>
<td>4</td>
<td>2</td>
<td>6</td>
<td>4</td>
<td>8</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>6</td>
<td>6</td>
<td>12</td>
<td>9</td>
</tr>
</tbody>
</table>

* = a target behavior for the subject
BEHAVIOR CHANGE MODULE

Purpose

The intention of each intervention is to cause a specific change in the Intern's (student teacher) teaching behavior.

Using either modeling plus written instructions (guidelines) or only written guidelines the cooperating teacher will present the required teaching behavior to the Intern. The purpose is to effect both an immediate and permanent change in the Intern's teaching behavior.

Method

1. The cooperating teacher will include in the normal program a weekly conference with the Intern.

   This conference should occur at the end of the teacher's last contact with the Intern on the day before the first formal observation by the researcher during that week.

2. During the conference the cooperating teacher will discuss (offer feedback) the Intern's performance during the past week and then, using the Intervention script, request that the Intern use either three new or modified behaviors in their teaching repertoire. One of these behaviors will be the research target behavior.

3. The target behavior should occupy the following positions in the cooperating teacher's presentation of teaching behaviors,

   Week 1 -- 2nd behavior
   Week 2 -- 1st behavior
   Week 3 -- 2nd behavior
   Week 4 -- 3rd behavior
   Week 5 -- 2nd behavior

   For example in Week 1 the teacher may request that the Intern,

   1. Increase positive feedbacks,
   2. Increase hustles,
   3. Avoid using superfluous language.

   In this example behavior "2" would be the target behavior relating to the study. Behaviors "1" and "3" are other behaviors deemed to be important and are typically based on the cooperating teacher's observations.

   Cooperating teachers should avoid mentioning the four research target behaviors before they have been systematically introduced by the researcher.
All other behaviors are "fair game" and should be attended to when the cooperating teacher believes it is appropriate.

4. Following the Introduction of a target behavior the teachers in the experimental group should include that behavior and its topographical components in their teaching for the remainder of the teaching practice. They must endeavour to maintain the target behavior and its associated criterion despite changes in content, environment and grade level.

5. Following the Introduction of a target behavior the teachers in the control group should avoid using that behavior for the remainder of the teaching practice. However, please note that this requirement only applies to the target behavior. The other two behaviors may be already present in experimental and control teacher's teaching and, if not, can be included whenever it is deemed appropriate by the cooperating teacher.

6. During the week of a particular intervention the Intern must observe, on at least two occasions, the teacher (control or experimental) teach the same activity and grade level that the Intern will teach.

Preferably the cooperating teacher will teach the lesson before the Intern on each of the videotaped (observed) days.

7. Teachers in the experimental group will ask their Interns to observe how they as cooperating teachers perform the three behaviors designated for that week. The experimental teachers should then collect and acknowledge the Intern's coding of the three target behaviors. Any recordings of behavior by the teacher and Intern will be analyzed by the experimenter each week on the second day of observation. The control teachers will not require that the Intern selectively attend to the three behaviors as they are manifest in the cooperating teacher's teaching.

8. On two occasions (days 3 and 5) following the Introduction of the target behavior all teachers will confirm the need to maintain the target behavior during all lessons as well as maintaining the other two behaviors during all lessons.

Feedback associated with the target behavior should be restricted to days 3 and 5 of the Intervention week. The target behavior will not be mentioned at any time after its week of Intervention by either control or experimental teachers.

9. At no time should the Interns be made aware of these guidelines. Cooperating teachers should transpose the written script onto a separate note pad to create the impression that the target behavior is a product of their analysis of the Intern's teaching.
STUDY 1

Teacher ___________   _________   Intern ___________   _________

Week 1

Initiate positive interactions with misbehavior cues, looking for good students.

Script
a. Feedback for previous week ad. 11b.

b. Behavior 1 - ad. 11b.

c. "The second behavior I would like you to adopt is to initiate 5 to 10 positive interactions with a misbehavior cue to motivate appropriate behavior in others.

  e.g. You are giving a demonstration of dribbling a ball. You simultaneously look for someone who is closely attending to your instructions, it may be the entire class. When you notice that someone is not attending you say to the attending student(s) 'Good, I like the way you are listening and looking while I am talking and demonstrating!'

  It will be that you initiate a positive interaction as a reaction to an inappropriate behavior cue."

d. Behavior 3 - ad. 11b.

e. Experimental Teacher, "I would like you to ___" (see p. 216 part "e").

f. Control teacher, "I would like you to ___" (see p. 216 part "f").

Week 2

Refrain from repeating children's answers while maintaining the level of questioning necessary to fulfill the class objectives. Repeating children's answers should be substituted with either "Yes!", "Think again!", "Almost right!", the answer repeated in a different content, or a similar response.

For example,

Teacher, "What animal is large?"
Student, "An elephant."
Teacher, "Everyone move like an elephant."

Script
a. Feedback from the previous week "__".
b. "The first behavior I would like you to adopt is to not repeat the student's answers to your questions. This will prevent you from becoming boring. It will also avoid sending the 'hidden message' that only certain answers are acceptable and that this quickly frightens other potential contributors and finally it requires that the respondent speak clearly so that everyone can hear the answer. Instead I want you to substitute either 'Yes!', 'Think again!', 'Almost right!' or repeating the answer in a different content. For example, Teacher, 'What animal is large?' I would like you to achieve a ratio of no repeats to repeats such that at least 50 percent of your response to students answers are no repeats."

c. 2nd behavior ad. lib.
d. 3rd behavior ad. lib.
e. Experimental Teacher, "I would like you to ___, etc."
f. Control Teacher, "I would like you to ___, etc."

Week 3

Give 5 or more selective attention demonstrations which relate to the objectives of the lesson.

Script

a. Feedback from the previous week "__".
b. 1st behavior - ad. lib.
c. 2nd behavior - ad. lib.
d. "The third behavior I would like you to adopt is to include at least five demonstrations in each lesson at the elementary school. These demonstrations can be given by either yourself or a student. They should highlight the objectives of the lesson and the children should be asked to selectively attend to one or two important features of the demonstration. The children must be made aware of what they should observe before the demonstration. The features will be those components which the children should develop during their practice of the skill. Follow this sequence:"
e. Experimental Teacher, "I would like you to observe __".
f. Control Teacher, "I would like you to __".

1. Verballize the two features (objectives) of the skill.
2. Give a demonstration.
3. Allow all students to practice immediately following the demonstration.

**Week 4**

Evaluate children's achievement of objectives (skill) by actively supervising the lesson using a checklist during class activity.

**Script**

a. Feedback from previous week "__".

b. 1st behavior - ad. lib.

c. "The second behavior I would like you to adopt is identify the two most important skill objectives for each class and include them on a checklist with provision for achieved (A), partially achieved (PA) and not achieved (NA). For example,

<table>
<thead>
<tr>
<th>Name</th>
<th>Long Jump</th>
<th>Hurdles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bill Smith</td>
<td>A</td>
<td>NA</td>
</tr>
<tr>
<td>Jill Smith</td>
<td>PA</td>
<td>PA</td>
</tr>
</tbody>
</table>

While you are actively supervising observe and record the performance of each child for each skill."

d. 3rd behavior - ad. lib.

e. Experimental Teacher, "I would like you to ___".

f. Control Teacher, "Mike, I would like you to ___".

**STUDY 2**

Teacher _____________ Intern ____________

**Week 1**

Use a non-descriptive cue as a means of bringing the students to a predetermined assembly position. The position should facilitate the observation of a class demonstration. This should be done a minimum of three times each class as well as every time a class demonstration is needed, for example,

- x - children
- o - teacher
- cue - two whistle blasts
Script

a. Feedback for previous week - ad. 11b.

b. Behavior 1 - ad. 11b.

c. "The second behavior I would like you to adopt is to use a non-descriptive cue, for example two whistle blasts or the command 'DEMO!'; a minimum of three times each class and every other time that you wish to give a demonstration to the class. The cue should mean that the children move quickly and quietly to a predetermined assembly point. The position of each child should be such that all children can see the demonstration while in a sitting posture. For example, the students could sit on the lines that mark the corner of the basketball court.

d. Behavior 3 - ad. 11b.

e. Experimental teacher, "I would like you to observe me using these three behaviors during my next class and then incorporate them into your own teaching for each class at the elementary school. Code how many times I use these behaviors."

f. Control teacher, "I would like you to include these three behaviors in your own teaching for each class at the elementary school."

Week 2

Refrain from repeating childrens' answers while maintaining the level of questioning necessary to fulfill the class objectives. Repeating childrens' answers should be substituted with either "Yes!", "Think again!", "Almost right!", the answer repeated in a different content, or a similar response. For example,

Teacher, "What animal is large?"
Student, "An elephant."
Teacher, "Everyone move like an elephant."

Script

a. Feedback from the previous week "__".

b. "The first behavior I would like you to adopt is to not repeat the students' answers to your questions. This will prevent you from becoming boring. This will prevent you from becoming boring. It will also avoid sending the 'hidden message' that only certain answers are acceptable and that this quickly frightens other potential contributors and finally it requires that the respondent speak clearly so that everyone can hear the answer. Instead I want you to substitute either 'Yes!',
'Think again!', 'Almost right!' or repeating the answer in a different content. For example,

Teacher, "What animal is large?" (as above)

I would like you to achieve a ratio of no repeats to repeat such that at least 50 percent of your response to students answers are no repeats.

c. 2nd behavior ad. lib.
d. 3rd behavior ad. lib.
e. Experimental teacher, "I would like you to ___."
f. Control Teacher, "I would like you to ___."

Week 3

Increase enthusiasm by altering voice volume and rate of speech. For the purpose of this study the volume and rate should increase when the teacher is delivering positive specific and general feedback and decrease when the teacher is giving knowledge about subject matter. The difference between the two voices should be identifiable by three independent observers.

Script

a. Feedback from previous week "___."
b. 1st behavior "ad. lib."
c. 2nd behavior "ad. lib."
d. "The 3rd behavior I would like you to adopt is to: I) significantly increase the volume of your voice when giving positive, specific or general feedback. An example of positive, specific feedback would be, 'Fine job, you followed through to get the rebound!' or, 'Tremendous class, you lined up beautifully!' An example of positive, general feedback would be 'Super!' or 'Way to Go!'; and, II) significantly decrease the volume of your voice when giving knowledge. An example of giving knowledge would be, 'When you throw overhand you should have the opposite foot forward.' Do these at least 40 times each class."
e. Experimental teacher, "I would like you to ___."
f. Control Teacher, "I would like you to ___."
Week 4

Evaluate children's achievement of objectives (skill) by actively supervising the lesson using a checklist during class activity.

Script

a. Feedback from previous week "___".

b. 1st behavior - ad lib.

c. "The second behavior I would like you to adopt is identify the two most important skill objectives for each class and include them on a checklist with provision for achieved (A), partially achieved (PA) and not achieved (NA). For example,

<table>
<thead>
<tr>
<th>Name</th>
<th>Long Jump</th>
<th>Hurdles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bill Smith</td>
<td>A</td>
<td>NA</td>
</tr>
<tr>
<td>Jill Smith</td>
<td>PA</td>
<td>PA</td>
</tr>
</tbody>
</table>

While you are actively supervising observe and record the performance of each child for each skill."

e. Experimental teacher, "I would like you to ___, etc.".

f. Control Teacher, "I would like you to ___, etc.".

STUDY 3

Teacher ________ ________ Intern ________ ________

Week 1

The teacher adopts a vantage point in the gymnasium from which to monitor or actively supervise the class. The vantage point should be the same each time and the teacher remains in that position for no less than 45 seconds one minute while observing and interacting with the students.

Script

a. Feedback from the previous week - ad. lib.

b. Behavior 1 - ad. lib.

c. "The second behavior I would like you to adopt is to identify a vantage point in the gymnasium from which you can monitor or actively supervise the entire class. The vantage point should be such that no children can move behind you. You should move
to this position at least 3 to 5 times during the class and
remain there for more than 45 seconds each time. The purpose
is to allow you to either systematically employ the
prompt-observe-feedback cycle, attend to the evaluation of
objectives, and/or obtain an overview of the children's
activity in class."

d. Behavior 3 - ad. lib.

e. Experimental Teacher, "I would like you to observe me using
these three behaviors during my next class and then
incorporate them into your own teaching for each class at the
elementary school and high school. Code how many times I use
these behaviors."

f. Control Teacher, "I would like you to include these (three)
behaviors in your teaching for each class at the elementary
school."

Week 2

Use the prompt-observe-feedback cycle 10 or more times during each
class.

Script

a. Feedback from the previous week - ad. lib.

b. "The first behavior I would like you to adopt is to use the
cycle, prompt-observe-feedback on at least 10 occasions during
each elementary class (NB! A prompt is a reminder of a
previous instruction) An example would be,

The teacher knows that children often forget to line up
quickly, quietly and without pushing. Before emitting the cue
to line up the teacher says, 'Now don't forget that when we
line up we do it without pushing and as quickly and quietly as
possible.' The cue to line up is given for example a whistle
blast. The teacher observes the children lining up. Teacher
says, 'Good job! I like how quickly and quietly and orderly
you lined up.'

Another example would be,

Teacher says, 'Mary, lean forward as you go over the hurdle.'
Teacher observes Mary run over the hurdle and says, 'Good!
That was better but you need to lean over even more to
maintain forward momentum.'

These prompts can relate to skills, strategies, activities or
simply appropriate way of behaving. Whatever the intent of
the prompt it should be given consistently and not only as a
result of a misbehavior cue and it should relate, if possible, to the objectives of the lesson."

c. 2nd Behavior - ad. lib.
d. 3rd Behavior - ad. lib.
e. Experimental Teacher, "I would like you to ___." 
f. Control Teacher, "I would like you to ___." 

Week 3

Increase enthusiasm by altering voice volume of speech. For purpose of this study the volume should increase when the teacher is delivering positive, specific and general feedback and decrease when the teacher is giving knowledge about subject matter. The difference between the two voices should be identifiable by three independent observers.

Script

a. Feedback from the previous week - ad. lib.
b. 1st Behavior - ad. lib.
c. "The second behavior I would like you to adopt is to: I) significantly increase the volume of your voice when giving positive, specific or general feedback. An example of positive, specific feedback would be, 'Fine job, you followed through to get the rebound!' or, 'Tremendous class, you lined up beautifully!' An example of positive, general feedback would be 'Super!' or 'Way to Go!'; and II) significantly decrease the volume of your voice when giving knowledge. An example of knowledge would be, 'When you throw overhand you should have the opposite foot forward.' Do these at least 40 times each class."
d. Experimental Teacher, "I would like you to ___." 
e. Control Teacher, "I would like you to ___." 

Week 4

Evaluate children's achievement of objectives (skill) by actively supervising the lesson using a checklist during class activity.

Script

a. Feedback from previous week "__".
b. 1st behavior "ad. lib."
c. 2nd behavior "ad. lib."

d. "The third behavior I would like you to adopt is to identify the two most important skill objective for each class and include them on a checklist with provision for achieved (A), partially achieved (PA) and not achieved (NA). For example,

<table>
<thead>
<tr>
<th>Name</th>
<th>Long Jump Landing</th>
<th>Hurdle Lead Leg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bill Smith</td>
<td>A</td>
<td>NA</td>
</tr>
<tr>
<td>Jill Smith</td>
<td>PA</td>
<td>PA</td>
</tr>
</tbody>
</table>

While you are actively supervising observe and record the performance of each child for each skill.

e. Experimental Teacher, "I would like you to ____.”

f. Control Teacher, "I would like you to ____.”
### Examples and Non-Examples

<table>
<thead>
<tr>
<th>Teacher Behavior</th>
<th>Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The teacher stands in the corner and continually offers feedback to the students for 60 seconds.</td>
<td></td>
</tr>
<tr>
<td>2. Teacher, &quot;Don't forget to line up quietly!&quot; Students are observed tip-toeing to the gym door. Teacher, &quot;There is no need to tip-toe.&quot;</td>
<td></td>
</tr>
<tr>
<td>3. Teacher raises her voice and says, &quot;Superb, Mike!&quot;</td>
<td></td>
</tr>
<tr>
<td>4. The teacher is recording the letters &quot;NA&quot; next to a student's name on a class list.</td>
<td></td>
</tr>
<tr>
<td>5. The teacher blows a whistle and the students move immediately to the corner of the gym and sit on the floor in a &quot;V&quot; formation. The teacher then gives a demonstration.</td>
<td></td>
</tr>
<tr>
<td>6. Following a student's answer the teacher says, &quot;Yes!&quot;</td>
<td></td>
</tr>
<tr>
<td>7. Teacher, &quot;When adopting the 'ready' position for the sprint start you should make a bridge with your thumb and first finger and place your front foot next to your rear leg. Watch me do that... Now everybody practice those two things.&quot;</td>
<td></td>
</tr>
<tr>
<td>8. The teacher asks the students to line up at the door. A few children are noticed dawdling. The teacher says, &quot;I like the way Andrew lined up quickly. Thank you, Andrew!&quot;</td>
<td></td>
</tr>
<tr>
<td>9. The teacher is standing in the gym talking to a student for 45 seconds.</td>
<td></td>
</tr>
<tr>
<td>10. Teacher, &quot;That's good, John! Now don't forget to keep your legs bent.&quot;</td>
<td></td>
</tr>
<tr>
<td>11. The teacher says in a quiet voice, &quot;Everybody get in your positions for the volleyball game.&quot;</td>
<td></td>
</tr>
<tr>
<td>12. The teacher stands marking the roll at the beginning of the lesson.</td>
<td></td>
</tr>
<tr>
<td>13. Teacher calls, &quot;Demo!&quot; and the students immediately form a file in the center of the gymnasium and await the demonstration.</td>
<td></td>
</tr>
</tbody>
</table>
14. Teacher, "I want everyone to sit on the black line and face me."

15. Teacher, "What's your name?"
   Student, "John."
   Teacher, "John."

16. The teacher gives demonstrations of three different skills while simultaneously highlighting the two most important features of each skill. The students are then allowed to practice.

17. Students are sitting in front of the teacher watching a demonstration. Some are not paying attention. The teacher turns to a student who is attentive and says, "Good boy!"

18. Teacher sits on a chair monitoring a group seated on the floor who are engaged in body percussion to music. The teacher may occasionally lead the exercise. After 30 seconds the teacher stops the activity.

19. Teacher, "Keep your legs bent when you do sit ups."
   Teacher, "Legs bent, John!"
   Student responds by bending legs.
   Teacher, "That's better."

20. Teacher, "Now remember to be moving when you exchange the baton."

21. The teacher calls out loud, "Let's move quickly between stations."

22. The teacher is attending to a checklist and recording "A" next to the name of a child who performed the required performance objective correctly.

23. In response to a student's answer the teacher says, "Try Again."

24. Following a teacher demonstration, which was preceded by verbal instructions, one group began practice and the other group played a game.

25. Students are bouncing the basketballs. Anthony is seen to be bouncing the ball above his head.
The teacher says, "I like the way John is bouncing the ball up to his waist".

26. The teacher, while standing on the bleachers, is actively supervising the students. Occasionally he squats down to try to repair the broken shoe lace. The total event lasted for 45 seconds.

27. Teacher says, "Eyes on the ball and opposite foot forward! Now, watch me . . . O.K. everyone practice, remembering eyes on the ball and opposite foot forward!"

28. Teacher stands next to a basket of balls and hands them to the students one at a time.

29. Teacher is actively supervising an aerobic exercise routine. The pre-recorded instructor says, "...to the right." The teacher notices some students moving the wrong way so she points with her arm toward the "right". Teacher, "That's better Joe now you're moving to the right."

30. Teacher yells, "Freeze!" All the students stand still. The teacher stands in the corner of the gym and monitors the students' stillness for 10 seconds.
Decision Log

Pre-study Decisions
The following decisions were made during the first two weeks of investigation:

1. Timetable complications necessitated the re-scheduling of the video-taping of two lessons for cooperating Model Teacher 1 and Intern 1. During the two weeks baseline the four weekly lessons of these subjects were video taped on the same day.

2. Use one teacher (M4/5) as the control model for Intern 4 and Intern 5.

3. Arrange for two assistants to video tape on two days so that the experimenter can be released to fulfill his commitment as a supervisor.

4. Consult teachers about the appropriateness of the target behaviors to their classes.

5. Both control and experimental teachers should code the behaviors of their interns.

6. Ask the interns about the behaviors they have been required to improve or include, by their cooperating teacher, in their teaching performance.

7. Reliability check 12 lessons each week rather than the planned six lessons.

Target Behavior Decisions
The following decisions were made during the baseline and Intervention phases of the study. Most of the decisions occurred during baseline and the first week of Intervention. Each decision is identified by the target behavior to which it relates.

Vantage Point

1. Teacher can adopt the same or different position in the gymnasium for each separate vantage point.

2. Reduce the criterion time of one minute for a successful vantage point to 45 seconds.

3. No student should move behind the teacher.
4. Teacher continually scans the class.

5. Teacher may actively supervise and/or monitor the class during a vantage point.

6. The time (45 seconds) begins from the end of instruction to the beginning of the next instruction provided the giving of the instruction stops the flow of the activity.

7. Teacher may move up to three yards away from the vantage point and retain his vantage point.

8. For C M1 and 11 for the activity called "freeze" it is possible to have a vantage point.

**Prompt-observe-feedback**

1. The initial instruction which preceded the prompt must occur during the same lesson as the prompt.

2. Prompts should give information to the student about the task.

3. Can be a verbal or non-verbal prompt.

4. Feedback can be positive, negative or corrective.

5. The cycle can relate to knowledge or activity.

6. The prompt is followed immediately by teacher observation which in turn is immediately followed by feedback relating to the prompt.

7. Feedback can occur simultaneously with observation.

**Voice enthusiasm**

1. When the teacher is talking to themselves it is not an instance of voice enthusiasm.

2. Knowledge is substantive content and should be delivered using a soft voice.

3. Specific or general feedback which is positive and delivered with a loud voice is an example.

4. Circle a check mark if there is indecision about the volume change.

5. Clapping while reinforcing with a normal voice is an instance of voice enthusiasm.
6. The change in volume should be confirmed by three expert judges.

Checklist evaluation
1. The teacher must have the checklist in their hand.
2. Check marks indicate five seconds of checklist behavior.
3. Teacher marks the checklist with A, PA, or NA.
4. All children must be assessed by the teacher in each lesson unless other arrangements are made between the cooperating teacher and the experimenter.
5. For all it was decided that it was appropriate to record for only half of the class in each lesson.

Non-descriptive cue for a demonstration
1. The cue does not include information about the desired behavior.
2. Children move to a predetermined assembly point.
3. The transition does not have to be followed immediately by the demonstration.

Non-repeats percentage
1. Include the asking of a student's name as a legitimate question for this behavior.
2. Put a circle around the check mark if the student's answer is not fully discernable.
3. Teacher responses to answers will be accepted as instances if they have similar meanings to "yes", "think again" or "almost right".

Selective attention demonstrations
1. The teacher or a student can give the demonstration.
2. The demonstration is immediately followed by the student's practice.

Positive interaction with a misbehavior cue
1. It is typically a piece of information or a prompt. It is not feedback following instruction.
2. It is feedback given to a target student or group which may
not be given immediately following the behavior. It is given with the intention of changing the behavior of the misbehaving student.

3. Substantive and non-substantive interactions are recorded as instances.

4. Typically the behavior begins with, "I like the way-----.

5. There must be a misbehavior cue emitted by a student other than the target student for interaction.