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THE NATURE OF LESSONS AND INSTRUCTION IN A MIDDLE SCHOOL
PHYSICAL EDUCATION CLASS: A SOCIAL
INTERACTION PERSPECTIVE

DISSERTATION

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

By
Kathy C. Graham, B.S., M.A.T.

** * * * *

The Ohio State University
1986

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To Mama, Lynn, and Debbie -
Who loved me enough to
let me go
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PUBLICATIONS


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Major: Teacher Education; Instruction
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CHAPTER I
INTRODUCTION

In 1974, Locke delivered a speech entitled, "The ecology of the gymnasium: What the tourists never see", in which he lamented a research literature that provided "no more than a superficial and badly conducted nature-walk through the gym, rather than the exquisite detail of an ecology described in all of its interdependent parts" (p. 38). Locke's statement of frustration was simultaneously a call for studies of daily life in the gym that showed the relationships of the various parts of the teaching-learning process to the whole.

Underlying this call was a view of the gymnasium as a dynamic, complex environment in which large numbers of students, diverse in nature, were engaged with the teacher in complex instructional activities. The physically active nature of the gymnasium was also seen as contributing to the dynamic and complex nature of physical education instruction:

In full swing a class of 35 4th graders doing a gymnastics unit is a seething mass of human interactions. Events happen at high speed, with high frequency, in multiple and simultaneous patterns, and take subtle forms. (Locke, 1975, p. 32)

Further, the nature of physical activity was seen as influencing both the role of the teacher as orchestrator of physical activity and the types of events that occurred in the gymnasium. What Locke did not
address specifically, however, was how the complexity of life in the gymnasium could be captured and then examined.

Paralleling Locke's call was the recognition from other areas of the educational research community of the need to find systematic ways of studying teaching-learning processes and of conceptualizing teaching as it occurred in everyday classroom situations. As will be seen, each call for examining the complexities of classroom life was accompanied by the suggestion of ways to accomplish that goal. Further, as each call was made, the ways suggested to increase understanding involved the use of broader conceptual lenses. Each of these ways will be reviewed briefly to set a stage for the discussion of the present study, which addresses Locke's concern for examining the complexity of instruction in the gymnasium. Since the present study is grounded in past research on teaching-learning processes, the discussion that follows provides an historical context for the study and a rationale for the conceptualization, design, and approach used.

HISTORICAL CONTEXT TO THE RESEARCH PROBLEM

Classroom Complexity: The 1970's

The first call came from Medley and Mitzel (1963) in the Handbook of Research on Teaching. In their chapter on measuring classroom behavior, they called for the use of direct systematic observation to study teaching. They identified—from a review of observational studies conducted to that point in time—whatever could be gleaned from that work that would be valuable in planning future observational studies. The authors noted that "examination of these
studies reveals many deficiencies in design and analysis resulting from the well-known lag between precept and practice" (Medley & Mitzel 1963, p. 248). Medley & Mitzel (1963) concluded from their review that obtaining the full range of information about teaching from observational data "can be obtained only if the most powerful statistical methods are used" (1963, p. 248). Thus, the first call for the study of classroom life identified direct systematic observation as the general direction for the study of teaching and the use of powerful modern statistical techniques" (Medley & Mitzel 1963, p. 248) as the particular route for analysis.

The second call, which paralleled Locke's (1974) call, came from Rosenshine and Furst (1972) in the Second Handbook for Research on Teaching. In their chapter on observational research they argued that while the more than 120 different instruments, created since Medley & Mitzel's (1963) initial call, had been used to capture a variety of phenomena in classrooms, the prevailing knowledge base was "chaotic, unorganized, and self-serving" (p. 22). Building on the work of Gage (1963), they called for programmatic research that followed the descriptive-correlational-experimental loop and that examined teacher effectiveness. The research direction generated from this call has become known as teacher effectiveness research. The general approach used was the process-product paradigm in which observed variables defined as reflective of teaching (student and primarily teacher behaviors) were correlated with student achievement outcomes (generally on standardized tests) in order to identify general laws of effective teaching. This work, then, pointed to the need to consider how teaching influences what gets learned.
The third call came from Dunkin and Biddle (1974) who, in their book *The Study of Teaching*, examined more than 500 studies of classroom teaching that were both systematic and observational. These authors concluded that through these 500 studies, a wide range of topics had been investigated - including classroom climate, management and control, the classroom as a social system, knowledge and intellect, logic and linguistics, and sequential patterns of classroom behavior. They maintained that what had been developed to that point in time was a set of concepts that described the processes of teaching and a set of instruments for the measurement of those concepts. Finally, this work was seen as debunking many of the overly simplistic models of teaching that were based on commitments about effective practice.

While these outcomes were seen as a positive step, the authors also identified a series of problems related to this research. First, there was a lack of consistency among findings; that is, some studies showed one set of factors to be related to teacher effectiveness while others contradicted that finding. Second, the choice of criterion variables against which to validate teaching processes (e.g., pupil achievement as measured by standardized achievement tests) was insensitive to the lesson taught or to the intended product of the classroom activity being observed. Third, many studies were based on commitment, philosophical, or experience based beliefs about effective instruction, and the findings were interpreted from an advocacy position that reflected these beliefs. Fourth, there was a problem of the model for integrating
this research. They found that some of the variables studied overlapped one another in meaning; many presumably co-occurred; some were causative, and still others were suggestive of more complex teaching processes than had actually been conceptualized at the time. Dunkin & Biddle (1974) concluded that

... in the long run we need to know not only what teaching processes occur, when they are likely to appear, with what other processes they co-occur, and what they produce in pupils when present or absent, but also we want to know why. (p. 410)

Like Rosenshine and Furst (1973), Dunkin & Biddle (1974) called for empirically based theories of teaching. However, unlike Rosenshine and Furst (1973), they did not recommend a single approach. Instead, they suggested a variety of models for studying teaching processes — including the trait model, the interaction model, the social system model, and the curriculum model. They went on to suggest that:

None of these models, then, is adequate by itself to accommodate the events of teaching. Each has some attractive feature. . . . Theories of teaching that utilize but one of these models are not likely to accommodate more than a portion of the events of teaching. (Dunkin & Biddle, 1974, pp. 415-416)

Their conclusions suggested that researchers must not only be concerned with the approach used but must also consider the conceptualization of teaching that underlies the approach. Finally, the conclusions suggested that a more holistic and complete understanding could be gained by consideration of what could be learned from each of the conceptualizations rather than limiting one's understanding to a single view.
The fourth call, which paralleled the other two calls of the 1970's, came in 1974 in the form of a conference sponsored by the National Institute of Education, which was founded two years earlier in 1972. NIE asked Professor N.L. Gage to convene a "conference of researchers and practitioners who would help to plan the funding of research on teaching" (Berliner & Koehler, 1983, p. 262). Ten panels were formed which collectively specified 50 approaches to the study of teaching and outlined 175 programs of research. The outcome of these panels was a set of 10 reports that provided the basis for the NIE research funding for almost a decade. Each panel reflected a different view of teaching and teaching-related processes: teaching as human interaction (Panel 1), as behavior analysis (Panel 2), as skillful performance (Panel 3), as a linguistic process in a cultural setting (Panel 5), as clinical information processing (Panel 6), among others. The funding of research based on the recommendations of these panels signaled NIE's recognition: a) of the complexity of teaching and of classrooms, b) of the fact that multiple conceptions of teaching had been conceptualized, c) of the existence of diverse approaches to the study of complex processes of teaching and classroom life, and d) that which approaches would bear fruit could not be predicted.

To summarize, the calls of the '70s were for studies of the complexity of life in classrooms. These calls provided the thrust for the studies of teaching and learning for almost a decade. The last set of calls in the 80's build on this research and reflect research directions developed during this period.
Classroom Complexity: the 1980's

The calls of the 1980's differ from those of the 70's. In less than a decade, a systematic body of work had been produced and the field of research on the study of teaching developed. This field has developed "its own scientific traditions and methodology for the study of teachers and students in classrooms and schools" (Berliner & Koehler, 1983, p. 262). As will be seen in the remainder of this section, the calls of the 80's reflect the work and developments in this growing field.

The need to consider the research stimulated by various conceptualizations and ways of studying teaching led in 1982 to a second Conference, the Airlie House Conference, and the fifth call. At this Conference in Warrenton, Virginia, leading scholars reviewed systematically much of the research sponsored by NIE in the 1970's. Entitled "Research on Teaching: Implications for Practice", the conference involved identification of ten viable and successful fields of inquiry for increasing understanding of the complexities of teaching and schools. Eight of these areas were influenced by the earlier 1974 effort at the Dulles Conference. They included the study of teaching and learning from a sociolinguistic perspective; classroom organization and management; student perceptions of schooling; ecological studies of classrooms and schools; teaching functions; studies of teacher judgments plans and decisions; collaborative research on teaching; and teacher recruitment, selection, and retention. In addition, two new fields of inquiry, or "hot-topics" (Berliner & Koehler, 1983, p. 263), were recognized at
the 1982 conference that had not derived from the NIE funded work of the 1970's: school effectiveness and staff development research. Thus, the 1982 call from Airlie House involved the identification of fields on knowledge about teachers and schools that were the product of growing scientific traditions and methodologies.

The sixth and most recent call came in 1986 with the publication of the third edition of the Handbook of Research on Teaching. In the first chapter of this most recent guide to what is known about teachers, teaching, and learning, Shulman (1986) presented an analysis of research on teaching. He took the most critical look yet at the need to capture the complexity of teaching-learning processes, as well as at the conceptualizations of teaching that have emerged to accomplish this goal. He describes five programs of research that "direct, model, or point the way for research on teaching" (Shulman, 1986, p. 3). Following the past work on instruction identified previously, these programs were:

- Process-Product;
- Time and Learning;
- Pupil Cognition and Mediation of Teaching;
- Classroom Ecology;
- Teacher Cognition and Decision Making.

Shulman (1986) suggests, however, that while a variety of perspectives are available, the assumptions one has about life in classrooms influence the manner in which teaching and learning are studied.

Shulman (1986) maintained that the first three programs of research share family membership in the process-product or teacher effectiveness research tradition. He maintained, as did Brophy and Good (1986), that this tradition has been successful in providing the
bulk of the knowledge base on teaching. Shulman (1986) further suggests, however, that this program of research is based on "truncated, molecular conceptions of process" (p. 14) that present serious limitation to understanding the complexities of classroom life. While he acknowledges that all programs of research provide a limited view, he points to some programs that provide a broader view and thus lead to increased understandings of the complexities of classroom life. The fourth program of research, classroom ecology, is one perspective or orientation suggested by Shulman (1986) for extending current understandings of the complexity of classroom processes, as well as creating new understandings about life in classrooms.

One of the several approaches within the classroom ecology program identified by Shulman (1986) -- and likewise by NIE in 1982 -- as comprising a successful field of inquiry is the study of classroom processes from a sociolinguistic or social interaction perspective. In describing this field of inquiry, Shulman (1986) suggested that the assumptions underlying the approach reflect the conceptualization of teaching and learning as complex social and instructional processes. He cites Green and Smith's (1983) review of this work:

Central to this conceptualization is the view of classrooms as communicative environments in which the events that make up everyday life are constructed as part of the interactions between teachers and students. From this perspective, events evolve during interactions as teacher and students work together to meet instructional goals. Therefore, classroom events . . . are dynamic activities constructed by teachers and students as they process, build on, and work with both their own and other's messages and behaviors. The
goal of this work is to understand the nature of teaching - learning processes from the perspective of the participants and to identify those factors that support learning. (pp. 355-357)

While Shulman (1986) identifies the social interaction perspective as one approach for increasing understanding of the complexities of classroom life, he is quick to point out, however, that like the process-product approach to research, this or any single approach or program, is necessarily insufficient. Each illumines some aspects of teaching while shadowing others. Responding to Dunkin and Biddle's (1974) call some 12 years earlier, Shulman (1986) suggested that while this approach can extend upon and add to an understanding of classroom processes, a more comprehensive understanding can be gained by considering what is learned from each of the programs combined. However, Erickson (1986) raised a warning about such efforts and suggested that the issue is not one of simply combining findings or approaches. He argued that the difference in conceptualizations make merger or combination impossible. The difference in perspective of these researchers suggests the need to examine how findings from one program can be used to inform other programs.

The final call brings us back to Locke and to physical education. Locke's call in 1986 differs from the one in 1974, however. In his speech on the "Ecology of the Gymnasium", Locke (1974) gave little indication as to how the goal of increasing understanding of the complexity of life in the gym could be achieved. That is, little mention was made of a research approach that would provide increased
understandings. Not so in 1986. In an address on the future of pedagogy to the American Academy of Physical Education, Locke (1986) clearly charted an approach or direction that research on teaching and learning must take if increased understandings of life in the gym are to be gained:

Where are we going in research on instruction? No where at all. Investigators will stay right where they are: in the field watching, recording, asking questions, and puzzling about what's going on. The difference, and despite surface appearances it is a difference, rests in the fact that they will be looking longer and more intensely - beyond surface behaviors into the deeper structures of social context and personal meaning. (p. 8)

What, then, can be concluded from Locke's (1986) call, as well as from the calls emanating from the other members/areas of the educational research community? Three primary assumptions about teaching, and the study of teaching, can be extracted. The first is that teaching and learning are complex and dynamic processes in which both instructional and social events are co-occurring and interrelated. The second is that no single model or program of research is sufficient to capture the full complexity of life in gymnasiums or classrooms. Finally, the way in which the processes are conceptualized influences how the process is studied and thus what can be learned about the complexity of teaching-learning processes. These assumptions help to form the rationale for this study.

THE RESEARCH PROBLEM

Given the assumptions identified above, the problem was to identify a theoretical and methodological approach to research that
would increase understandings of daily life during an instructional unit in physical education by capturing as much of the complexity of life in the gym as possible. The view of teaching and learning processes as complex social and instructional phenomena necessitated a process of inquiry that would allow them to be explored in depth while limiting, as much as possible, the extent to which they became distorted through description. What was needed, therefore, was a conceptualization of teaching and learning that would allow both the complex and dynamic nature of life in physical education to be captured for indepth analysis and insightful reflection.

The approach selected in this study was one of several approaches recognized in the third edition of the *Handbook of Research on Teaching*, and by the National Institute of Education in 1982 (Shulman, 1986). This tradition of research focuses on the study of classroom processes from a social interaction perspective (Erickson, 1986; Shulman, 1986; Cazden, 1986; Wilkinson, 1982; Green & Wallat; 1983). Central to this perspective is the view that teaching and learning are active communicative environments in which both social and academic goals are pursued (Green, 1983a, 1083b).

The theoretical and methodological approach to the study of teaching and learning from a social interaction perspective are all new to physical education. The approach, however, was not merely "lifted" from classroom research and applied to the study of physical education instruction. Rather, the approach was both sufficiently broad and sufficiently flexible to allow it to be modified to meet the unique needs of the physical education setting, that is, to
capture both the talk (verbal) and activity (nonverbal) dimensions of life in the gym.

This study, then, was undertaken in part to examine what could be learned about the nature of teaching and learning within a given unit of instruction utilizing a social interaction perspective. The study, therefore, answered both the research questions identified later in this chapter, as well as demonstrated what can be learned about life in physical education using the approach.

Assumptions Underlying the Study of Teaching and Learning from a Social Interaction Perspective

To provide a general frame for what is meant by a social interaction perspective, two illustrative assumptions underlying this approach are identified below (Green, 1983a, 1983b). A more complete discussion of these constructs is presented in Chapter II.

1. The first major assumption of the social interaction perspective is that gymnasia are dynamic communicative environments in which interactions between and among participants have multiple outcomes and meanings. The moment-to-moment interactions between and among participants are part of a dynamic process that has social as well as academic consequences. Assumption of dual outcomes of instruction means that students are simultaneously engaged in acquiring understandings about how to conduct themselves socially as they acquire knowledge about the academic content of instruction.

2. A second assumption of the social-interaction perspective is that instruction is a goal-oriented process. The goal-directed nature of instruction can be observed through exploration of the
instructional conversation between and among teacher and students and the nonverbal actions of participants. Observing verbal as well as nonverbal actions permits description of the social and academic content of lessons (e.g., the expectations for both social behavior and academic content learning). By observing and exploring both the teacher's and students' patterned ways of interacting, one can begin to describe complex social and instructional events within and across lessons.

The discussion that preceded highlighted two illustrative constructs underlying the study of teaching and learning from a social interaction perspective. These constructs suggest a view of life in the gym as complex and dynamic in nature.

An Overview of the Research Approach

The goal of research conducted from a social interaction perspective is to understand the teaching-learning process from the perspective of the participants and to identify those factors that support and constrain achievement. This goal is arrived at by looking within the physical education lesson in great detail and then comparing it with other lessons studied in equally great detail. This process involved the extraction of recurring patterns of action and interaction in the physical education class. Variables grounded in the observed patterns were constructed and tested across cases. This process led to refinement of initial questions posed for the study and to the identification of several additional questions regarding the nature of daily life in the gym. The formulation of
new questions led to the extraction of additional patterns and the process thus repeated itself. The findings, therefore, are a product of the reactive-interactive nature of the research process. The existence of a permanent, videotaped record provided the means for moving between analysis and data and re-contextualizing findings in order to determine meaning, function, and occurrence.

The assumption underlying the research process is that when one sees a particular instance of a teacher teaching, some aspects of what occurs are generic, some are specific to the historical and cultural circumstances of that type of situation, and some are unique to that particular event (Erickson, 1986). The task of the researcher is to filter through the different layers and levels of complexity that are confronted in the specific case at hand. That is, the researcher attempts to sort out what is broadly universal, what generalizes to other situations, and what is unique to the instance (Erickson, 1986). This perspective facilitates the identification of factors that support and constrain student learning.

PURPOSE OF THE RESEARCH AND RESEARCH QUESTIONS

The general purpose of this study was to increase understanding of complex processes of teaching and learning in physical education. Both the general purpose of the study and the resulting conceptualization of the physical education class as a physically active and communicatively active environment led to the primary goal of the study:
The identification of factors that support and constrain students' academic performance (i.e., motor skill performance) within and across the 14 lessons of an instructional unit on volleyball.

Three major research questions guided the process of observation and analysis of data:

1. What is the nature of the organizational structure of the lessons in the volleyball unit? The purpose of this question was to determine the manner in which lessons were organized and the influence of this organization on students' academic performance. This major question consisted of the following subquestions:

   1.1 How is the organizational structure of the lesson on one day both similar to and different from the organizational structure on other days?

   1.2 How is time distributed within the organizational structure of the physical education class?

   1.3 What are the major movement tasks around which the academic work of the lessons is organized?

2. What is the nature of the social structure of the lessons in the volleyball unit, in which the academic work of the lessons is simultaneously embedded? The purpose of this question was to determine the normative requirements for student conduct in the physical education class and the manner in which those requirements influenced the academic work of students. This major question consisted of the following subquestion:
2.1  What are the normative requirements for acting or conducting oneself as a student in the physical education class?

3.  What is the nature of the academic structure of the Movement Task Unit in the volleyball unit? The purpose of this question, the foregrounded question in the study, was to gain information about the primary unit of academic work in the physical education class - the movement task. Specifically, the intent was to determine the nature of task presentation by the teacher and participation in physical activity by students, as well as the nature of students' motor skill performance. This major question consisted of the following subquestions:

3.1  What is the nature of the information communicated to students during the Task Presentation Phase of the Movement Task Unit?

3.2  What is the nature of students' participation in physical activity and information communicated by the teacher during the Practice Phase of the Movement Task Unit?

3.2.1  What is the nature of students' engagement in the stated movement task during the Practice Phase of the Movement Task Unit?

3.2.2  What is the nature of students' efforts to modify the stated movement task?
3.2.3 What is the nature of the teacher's response to students' efforts to modify the stated movement task?

3.2.4 What is the nature of students' motor skill performance during the Practice Phase of the Movement Task Unit?

3.2.5 What is the nature of the information communicated by the teacher during the Practice Phase of the Movement Task Unit?

Limitations to the Study

Given that this study was conducted within the framework of a particular perspective - a social interaction perspective - it is, without choice, necessarily limiting (Shulman, 1986; Evertson & Green, 1986; Dunkin & Biddle, 1974; Morine-Dershimer, in press; Weinstein, 1983; Mead, 1975; Fassnacht, 1982). Any perspective selected for examining complex processes of teaching and learning provides a lens through which to view these processes (Evertson & Green, 1986). The descriptions obtained and the understandings gained via the application of this lens are therefore prefigured by and limited to that perspective (Shulman, 1986). Acknowledgement of the limitation of a single perspective is consistent with the basic rationale for the study - that no one way of looking, that is, no one study or program of research can capture the whole of the complexity of life in the gym. In addition to the preceding limitation, three other potential limitations are also acknowledged.
Limitation #1

This study is a case study of certain dimensions of daily life in a middle school physical education class in midwestern Ohio. The descriptions obtained, therefore, cannot be generalized beyond the scope of the class during the 14 days in which the study was conducted. While the lack of generalizability might be considered as a limitation, the intent was not to generate descriptions of teaching learning processes and to obtain findings about practice that would be immediately generalizable to other classes, settings, age levels, and so on.

Given the newness of the overall research approach to the study of instruction in physical education, the intent was 1) to determine what kinds of understandings could be gained from the application of the theoretical and methodological framework of a social interaction perspective; 2) to obtain indepth descriptions of processes of teaching and learning; and 3) to identify factors that supported and constrained the academic performance of students in the class. Ultimately, it is hoped that the descriptions and factors identified in this study will become part of a larger body of findings from research conducted from this perspective. As the findings accumulate, it should be possible to look across studies of life in the gym and identify those aspects that are generic across settings, those that are specific to certain types of classes, and those that apply only to the setting under study (Erickson, 1986). Shulman (1986) argues that for those aspects of instruction that are both
generic and specific to certain types of settings, a case literature should be developed to help define the knowledge base on teaching.

Until these descriptions are generated and the case literature developed, no attempt is made by the researcher to generalize the findings. However, what the findings do provide is a series of questions, issues, and sensitizing concepts for consideration by those engaged in practice. In addition, the investigator leaves it to the consumer of the research to determine the extent to which the findings from this study are useful in reflecting upon his/her practice. Ultimately, as Fenstermacher (1986) argues, one of the primary grounds upon which research can be considered valuable is the extent to which it allows an individual to reflect upon practice with the intent of understanding and improving that practice.

**Limitation #2**

The second limitation to this study is the failure to assess student learning with respect to students' scores on an end-of-instruction product measure — which, in the case of this study — would have been a motor skill test. The absence of the product measure precludes determination of whether the descriptions obtained were descriptions reflective of a class in which student academic learning occurred (i.e., learning as defined by scores on an end-of-instruction product measure).

**Limitation #3**

The researcher conducting the investigation was the teacher in the physical education class in which the study was conducted. The
"researcher as teacher" distinction is acknowledged as both a potential strength and limitation to the study. It is a source of potential strength because the researcher has access to an "insider perspective" and to teacher intentions. "Researcher as teacher" is recognized as a potential limitation due to the possible influence on researcher objectivity in the analysis and interpretation of the data. While acknowledging this factor as a potential limitation, recognition by the researcher of this potential for influence on objectivity led to the adoption of a variety of measures and procedures to minimize this influence and to establish trustworthiness of the data. Extensive use of external observers, that is, observers other than the researcher, occurred to insure trustworthiness of the data.

SUMMARY

This chapter provided a rationale for the study, a description of the general approach to the research, the purpose of the study and related research questions, and the limitations to the scope of the study. The chapters that follow respectively present a review of the literature related to the study, the methodology of the study, the findings from the study, and a discussion of the findings.
CHAPTER II
REVIEW OF THE LITERATURE

The third edition of the Handbook of Research on Teaching is a guide to the field of study of teachers, teaching, and the learning process. In the opening chapter of the Handbook of Research on Teaching, Shulman (1986) identifies five programs of research that have provided a framework for considering what has been learned about the complexity of teaching and for guiding future efforts "to add to that fund of understanding" (p. 3). These programs include both traditional and new approaches to the study of teaching and thus reflect a broad range of ways that teaching has been conceptualized and studied. These programs of research are Process-Product, Time and Learning, Pupil Cognition and the Mediation of Teaching, Classroom Ecology, and Teacher Cognition and Decision Making.

In addition, the Handbook of Research on Teaching provides the most recent and comprehensive reviews available of the findings from each of these programs by notable scholars in the field of educational research (i.e., See Brophy & Good (1986) for findings from Process-Product and Time and Learning; Wittrock (1986) for findings from Pupil Cognition and the Mediation of Teaching; Cazden (1986) and Erickson (1986) respectively for findings from and a discussion of the Classroom Ecology Program; Clark and Peterson (1986) for findings from Teacher Cognition and Decision Making).
Given the timely publication of this guide to the field of study of teaching, the purpose of this chapter is not to review research syntheses and/or individual studies on teaching -- most of which have examined carefully by scholars in the Handbook of Research on Teaching.

PURPOSE OF THE REVIEW

Several factors provided the basis for this review. One of the principle ones was the omission from the 1986 edition of the Handbook of Research on Teaching of a review of the subject matter findings from research on teaching in physical education. This omission suggested a need to bring together physical education research with the general programs of research as part of the framework for this study. This review of the literature, then, serves two purposes:

1) to place research on teaching in physical education within the broader perspective of the research community by examining research conducted within each of the various programs identified by Shulman (1986). In so doing, an increased understanding can be gained of what has been learned overall from research on teaching regarding the complexities of life in the gym.

2) to place the present study in a research perspective in which it can be viewed independently of, and in relation to, other studies and programs of research on teaching in physical education. In so doing, an increased understanding can be
gained of what can be learned about the complexities of life in the gym from a social interaction perspective.

To accomplish the first two objectives, two areas of the literature are reviewed. One is the five programs of research identified by Shulman (1986). Subsequent to the overview of each research program is a review of representative studies of teaching and learning in physical education within each of those programs. The intent is not to provide indepth reviews of the methodology and/or findings of the research but to show the nature and scope of information obtained, as well as the kinds of understanding of teaching gained. Given that the bulk of research on teaching in physical education has been conducted within the process-product program of research and that the present study was generally stimulated by the need to increase understandings about many of the "sensitizing constructs" (Bulmer, 1979) that have emerged from this research, a greater proportion of time is devoted to a review of studies of teaching in the gym that fall within this program than the others.

The review is representative not inclusive. First, those research studies highlighted were restricted to those that were published between 1975 and the present and to dissertations completed within the same time frame. Second, studies were selected to illustrate the general kinds of understandings gained from studies within each research program. Convergence of findings was not a criterion. Finally, where possible, studies were selected that were cited in one or more of the reviews of research in physical education
(e.g., Dodds & Locke, 1984; Dodds & Rife, 1983; Housner, 1985; Siedentop, 1982, 1984).

To accomplish the second objective, two additional areas of the literature are reviewed. First, there is a review of the theoretical constructs that are simultaneously outcomes from the research on social interaction in classroom settings as well as assumptions undergirding the process of inquiry in this perspective. Highlighted secondly are representative findings from studies conducted from a social interaction perspective. Similar to the first objective, the intent is not to provide exhaustive and/or detailed descriptions of findings. Rather, the intent is to show that exploration from a social interaction perspective can increase understanding of complex processes of teaching and learning by providing new insights about previously investigated phenomena, as well as phenomena not yet studied. Given that the present study is the first in physical education to use the theoretical and methodological approach of a social interaction perspective, there are no findings to review from within this subject matter field. Therefore, the findings highlighted are from classroom research. Those findings reviewed were selected because they illustrate the kinds of understandings of the complexities of teaching that could be gained from a social interaction perspective.
SECTION ONE
FIVE PROGRAMS OF RESEARCH ON TEACHING IN PHYSICAL EDUCATION

Overview of Process-Product Program

The first program of research in which work in physical education is examined is the process-product program. The teacher effectiveness or process-product approach to research (cf. Mitzel, 1960; Gage, 1963; Rosenshine and Furst, 1973; and Dunkin and Biddle, 1974) is described by Shulman (1986) as "easily the most vigorous and productive of the programs of research on teaching during the past decade" (p. 9). Grounded in the general research tradition of applied behavioristic psychology (The specific research approach was identified by Gage (1963) as the criterion of effectiveness paradigm), process-product research was given strong impetus by the model for the study of teaching developed by Dunkin and Biddle in 1974 (cf. Mitzel, 1963).

The general approach of the process-product program has been to focus primarily on the teacher in an attempt to identify teacher behaviors (processes) that are statistically related to student outcome measures (products) (Rosenshine and Furst, 1973). This work is often spoken of as correlational research. The basic task of the process-product researcher has been to determine on an a priori basis the criteria for student achievement (i.e., outcomes) and then to identify those teacher behaviors-most often defined a priori as well - that are the predictors of effectiveness. In addition, those engaged in process-product research have often compared teacher
behavior in higher achieving classrooms with teacher behavior in lower achieving classrooms.

Research in this tradition assumes that greater knowledge of . . . [teacher behaviors that are related to student achievement] will lead to improved instruction: once effective instruction is described, then supposedly programs can be designed to promote those effective practices. (Anderson, Evertson, and Brophy, 1979, p. 193)

The major findings from teacher effectiveness research are in the form of "teacher should" statements (Brophy and Good, 1986), propositions (Shulman, 1986), rules (Gage, 1986), and strategies of teaching (Berliner, 1984). These "teacher-should" statements, rules, and so on describe those aspects of teacher behavior that are correlated with gains in student achievement. The aspects described are usually either

- classroom management (responses to misbehavior, allocating of turns, establishment of rules) or generic instructional behavior (use of lower or higher order questions, frequency or praise or criticism [treated as feedback], wait time). (Shulman, 1986, p. 12)

When considered collectively, these statements, strategies and so on provide a normative model of effective teaching (i.e., See Brophy and Good (1986) for a full description of this model).

In addition to the correlational research that has helped to produce this normative model, the general process-product program of research has two variants - descriptive research and correlational research (Shulman, 1986). When considered together, these three kinds of research comprise the descriptive-correlational-experimental loop identified by Rosenshine and Furst (1973)(cf. Gage, 1963).

Generally speaking, for those engaged in descriptive research,
"classroom observation would lead [first] to the development of instruments to measure (describe) teaching in a quantitative manner" (Brophy & Good, 1986, p. 331) and then to a description of teaching based upon the system developed or selected. This stage would be "followed by correlational studies to relate the descriptive variables to achievement" (Brophy & Good, 1986, p. 331). This correlational research is most commonly referred to as process-product research. While the bulk of the findings within the process-product tradition is based upon research that is descriptive and correlational in nature, researchers in recent years have conducted a series of "experimental studies to test promising correlational relationships for causal effects" (Brophy and Good, 1986, p. 331). That is, composites of the effective teaching have been translated into experimental teacher training treatments and tested across a variety of situations (e.g., Evertson, Weade, Green & Crawford, 1985).

A second area of experimental research comes from the tradition of behavior analysis. While it can be argued that experimental research on teacher behavior modification within the behavior analysis tradition and experimental research on teaching within the process-product or teacher effectiveness tradition are fundamentally different enterprises, they are both concerned with improving teaching by manipulating variables to produce designated changes in behavior. Given this shared mission and the fact that the majority of the experimental studies on teaching in physical education have been conducted within the behavior analysis perspective, this
research will be considered within the process-product or teacher effectiveness tradition for the present discussion.

Review of Physical Education Studies within the Process-Product Research Program

Three types of research are included in the review of the work in physical education conducted within the process-product program: descriptive, correlational, and experimental. As indicated earlier, this program of research has provided the main of the knowledge base on teaching in physical education. Given that correlational research on teaching and learning has recently been the primary focus of interest by those doing work within this program, emphasis is given to a review of these findings.

Descriptive Studies

William G. Anderson's (1975) work with the Video Tape Data Bank Project at Teachers College was a pioneer effort in descriptive research in physical education. Culminating in the publication of What's Going on in Gym (Anderson & Barrette, 1978), this work involved the study of 83 physical education classes in 60 schools. The classes videotaped included 40 elementary school classes, 20 high school girls' classes, 20 high school boys' classes, and three coeducational classes. Members of the project team developed descriptive category systems that described student behavior (e.g., practice, game playing, exercise), teacher behavior (e.g., organizing, preparatory instruction, establishing and enforcing codes of behavior) teacher-student interaction (e.g., questioning/response;
acceptance/praise), augmented feedback (e.g., evaluative, descriptive, prescriptive) given by the teacher, and teacher's pedagogical moves. From this work three themes about life in the gym were identified (Hurwitz, 1978).

Physical education classes are fast paced, constantly changing, and perhaps exciting;

Physical education classes are traditional and teacher centered and are characterized by a great deal of information giving and direction by the teacher, narrow responding, extended drilling or extended game play by students;

Physical education classes have patterns of variability for both teachers and students.

Reflection upon these findings led Hurwitz (1978) to suggest directions for future research that would extend upon what had been learned about teaching from the Data Bank Project. Among those directions was:

... we must attempt to develop an underlying structure of all that occurs in physical education classes. Such a structure would define all the aspects of what occurs ... [and] would delineate the relationships among those aspects ... (pp. 80-81)

Overall, the results of the Video Tape Data Bank Project were consistent with findings reported by Pieron (1980) in a series of studies conducted at the University of Liege and findings reported by McLeish (1981) at the University of Victoria from a study of 104 videotaped physical education classes.

In addition to the descriptive research conducted by Anderson (1975) and his students, the Cheffers Adaptation of the Flanders
Interaction Analysis System (CAFIAS) was the primary observation tool used in 27 descriptive research projects between 1972 and 1980 (Cheffers, 1982). Categories in the system included, but were not limited to praise, question-asking, giving facts, and so on. These categories were not unlike those used in research at Teachers College. Thus, when the descriptive studies of physical education in the seventies are considered collectively, the specific findings from the work may vary. However, the general kinds of information obtained about "what's going on in gym" (Anderson & Barrette, 1978) are basically the same.

**Correlational (Process-Product) Research**

Prior to the discussion of the findings from the process-product program of research in physical education, a distinction needs to be made between classroom research and much, though not all, of the physical education research within the process-product program. Process-product or teacher effectiveness research in the classroom has typically involved studies of considerable magnitude -- in terms of the length of the study, the number of teachers observed, amount of funding available, and so on. Pieron and Graham (1984) concluded that "in physical education full scale process-product studies, employing the same design as the classroom studies, can hardly be envisaged" (p. 9).

Given these limitations, an alternative route has been taken by a number of researchers interested in the study of effective teaching in physical education (i.e., Yerg, 1977, 1981, 1982; Pieron and
Piron, 1981; Pieron, 1982; 1983; Yerg and Twardy, 1982; Graham, Soares, and Harrington, 1983; Metzler, 1983; and DeKnop, 1983). This route has been the experimental teaching unit, or ETU (Filby, 1972). The general model for ETU research in physical education has its roots in the Beginning Teacher Evaluation Study in 1972:

Essentially an ETU consists of an introduction during which the teacher which discusses the rationale for the unit, specific performance objectives - each of which is keyed to items on pre- and post-tests, pre-tests for students, a wide variety of instructional materials and activities from which teachers may choose, and a post-test for students. Although an ETU focuses on content areas that conform to accepted curriculum objectives for the given grade level, it attempts to cover material not ordinarily stressed by teachers at that grade level. (Ward and Tikunoff, 1976, pp. 50-51)

The utilization of this model of the ETU as a research alternative to the large scale, classic process-product study has enabled researchers in physical education to study the relationships between teacher behavior and student achievement.

In his 1983 review of ETU research in physical education, Graham provides a basic description of the parameters of the ETU as it has been used in these settings:

... an ETU is a brief series of lessons on a topic that is of general interest to the grade level of students to be taught by the teachers in the experiment. ... ETUs are characterized by:
1. A measure of student learning developed specifically to measure the instructional content taught in the ETU which is administered before and after the actual ETU lesson(s) are taught;
2. A universal learning objective set forth for all the teachers;
3. A relatively short teaching period;
4. Systematic observation of selected teacher and student behaviors conducted during the actual ETU lesson(s). (p. 9)
While the preceding discussion defined the basic model of the ETU used by many researchers studying effective teaching in physical education, it should be noted that a range of differences occurred among the studies in terms of their design and implementation.

Although the ETU was the route taken by many of those engaged in teacher effectiveness research in physical education, others took the less restricting, more traditional route of the small scale process-product approach (e.g., Rink, 1983; Rink and Werner, 1985; Oliver, 1983). Given the two variations of correlational research conducted within the process-product program of research in physical education, representative findings are discussed in separate sections.

**Findings from ETU Correlational Studies**

Pieron and Graham's 1984 review of ETU research on teacher effectiveness provides the primary basis for the current discussion. The authors report that in the 11 studies reviewed a variety of teacher and/or student behaviors (i.e., independent variables) were the focus of investigation. Many of these behaviors had been identified by those engaged in descriptive research in the seventies (e.g., practice, game play, demonstration, feedback, managing equipment, task presentation, number of trials at practice of criterion task, and so on). While the independent variables varied across studies, the outcome or product measure selected as the indicator of teacher effectiveness was basically the same across studies - performance on a motor skill test at the conclusion.
of the ETU. Though there are differences among studies with respect to designation of both teacher and student behaviors, the findings coalesce around three primary constructs: 1) student engagement time, 2) task presentation, and 3) teacher feedback. While these constructs appeared in many of the studies, the manner in which they were operationalized varied from study to study. Findings relative to each construct are discussed briefly below.

**Student Engagement Time**

Pieron and Graham (1984) reported that "most of the studies corroborated the importance of time spent practicing the criterion task or the number of practice trials" (p. 11). In addition, time on task (i.e., operationalized as a measure of engaged time or Academic Learning Time) was found in several of the studies to be significantly related to achievement (Verg, 1981; Pieron and Piron, 1981; Phillips and Carlisle, 1983) (The concepts identified above will be discussed in greater detail in the section in this chapter on the Time and Learning Program of Research.). The authors also reported that two additional studies had data that converged in the same direction as the preceding studies but were without statistical significance (Graham, Soares, & Harrington, 1983; Verg, 1977). In contrast, the practice component in the Verg and Twardy (1982) study was found to be negatively associated with student achievement. In the discussion of their research, the investigators (i.e., Verg & Twardy 1982) attributed this finding to the design of the research
rather than existence of a negative association between the two variables.

The final way that student engagement was examined was in terms of student success during practice of the criterion tasks. Pieron (1983) found that students who learned more were successful more often. Similarly, students in the classes of more effective teachers were found to be successful more often than students in less effective teacher's classes (Phillips and Carlisle, 1983).

In the summary of their findings regarding student engagement on task, Pieron & Graham (1984) concluded that the time students spend on task, actually practicing the criterion task, is the strongest research supported variable yet in both physical education and classroom research. However, they maintain that an even greater understanding of this variable can be gained by obtaining research supported descriptions of the teacher's performance in those classes where high levels of student engaged time appear axiomatic. These findings/conclusions were one of several sets of outcomes from studies/programs of research on teaching in physical education that suggested the need to explore in depth the interrelationships between and among what the teacher tells students to do regarding the practice of physical activity, what students actually do when they practice, and the manner in which the teacher responds to what students do.
Task Presentation

Variables or process characteristics identified in several of the studies were clarity of the teacher's presentation of task and the amount of time spent by the teacher instructing a class. The primary outcome was that there was not a definitive relationship between either the clarity or conciseness of a teacher's instruction and student outcome measures. Pieron and Graham (1984) comment on this finding from their review of the 11 studies:

Future research efforts in this area probably need to focus more on the variables closely related to the quality of the teacher's presentation, rather than on simple measures of time. Variables such as clarity and "appropriateness of instruction" may lead to a better understanding of the function of a teacher's instruction in enhancing student learning. (p. 12)

Teacher Feedback

While Yerg (1980) and Graham, Soares, and Harrington (1983) found no significant difference between teacher feedback and gain scores, four other studies showed feedback to be an indicator of teacher effectiveness (Pieron, 1982; Yerg and Twardy, 1982; Phillips and Carlisle, 1983; DeKnop, 1983). These conflicting findings suggest the need to know more about the manner in which feedback both supports and constrains students' motoric performance.

Findings from Non-ETU Correlational Studies

While the core of correlational studies of teaching and learning in physical education has followed the ETU format, the studies discussed here are representative of those several that have followed the somewhat broader research design approach of classroom research
aon teacher effectiveness. In the first study, Rink's (1983) investigation of the stability of teacher behavior emanated from a concern over the tendency of researchers in physical education to observe a teacher for relatively short periods of time - usually one lesson - and to assume the stability of the observed behavior over time. In her study of three more and less effective physical education teachers during a 15 day volleyball unit, some teacher behaviors were found to be stable over time, while others were unstable. Rink (1983) called for future studies to examine the relationship of stable and variable teacher behaviors to effective instruction.

An additional finding from this study, as well as from another study by Werner and Rink (1985), led to questions regarding the appropriateness of the time on task variable as an indirect measure of teacher effectiveness. Rink and Werner (1985) indicated that the ALT-PE instrument (Academic Leading Time in Physical Education) (Siedentop, Tousignant, Parker, 1982) in its current definition failed to discriminate between more and less effective teachers. In both studies all but one of the seven teachers were considered to be good managers and were task-oriented in their approach to instruction. Rink & Werner (1985) maintained that the ALT-PE identified the poor manager but failed to discriminate the more effective teachers in the two studies from the less effective teachers, even though the differences in effectiveness were significant.
The authors suggested that the ACT-PE emphasis on quality practice was insufficient as a predictor of teacher effectiveness. Building on the work of Gentile (1972) and Yerg (1982), they concluded that:

"the appropriateness and quality of the response of the student is most certainly the important key to teacher effectiveness. The appropriateness and quality of response, however, is dependent upon the appropriate selection of the task in relation to the intended learning, the communication of the task, and the feedback students receive." (Rink & Werner, 1985)

They indicated that the interrelationship among these various factors is a critical key to effectiveness.

Their conclusions led to additional work in the 1985 study in which they examined a series of such "qualitative dimensions" (Rink & Werner, 1985) of such factors as task presentation, student responses, and teacher feedback (e.g., task presentation: clarity, task demonstration, accuracy of cues; teacher feedback: specific congruent feedback). The findings from this exploratory work indicated that the more effective teachers performed better on the qualitative dimensions of the three factors than the less effective teachers. Finally, Rink & Werner (1985) suggested that additional research needs to be done to continue the effort at sorting out the complex interrelationships among these factors in order to increase understanding of the supports and constraints upon student learning.

The final study reviewed in the non-ETU correlational studies is a large scale process-product study conducted by Oliver (1983) at The University of Texas. This study was undertaken to investigate the relationship between the direct instruction model of teaching and
teacher effectiveness in 30 secondary school physical education classes. Oliver (1983) concluded that while significant relationships were found between behaviors associated with direct instruction (Rosenshine, 1979) and student achievement, several caveats were in order:

1) The importance of students' perceptions cannot be overestimated. Oliver (1983) maintained that:

   if students do not perceive the importance of time parameters in physical education as representing a time to learn or having an academic focus, chances are they will approach instruction in the gymnasium with less than positive attitudes about acquiring ball skills. (p. 306)

2) Research has not determined with any certainty which type of student is most likely to benefit from direct instruction and under what context direct instruction is most likely to be effective. Thus, caution was urged to teacher educators and practitioners alike in automatically assuming the supremacy of this model of teaching over other ways.

The preceding review of correlational studies of teaching and learning within the process-product program of research illustrates the kinds of understandings gained from this work. The final area of studies to be reviewed in the process-product program are those that fall under the rubric of experimental studies.

Experimental Studies

The main of experimental research on teaching in physical education has been conducted within a behavior analysis perspective. Much of this work has been "a series of related doctoral
dissertations at The Ohio State University in the analysis and control of teacher behavior utilizing single subject strategies" (Siedentop, 1982, p. 86). Perhaps the most important findings from this research are that teacher behavior can be modified and that the initial evidence suggests that the types of changes that can be achieved have sufficient valence to influence student performance (Siedentop, 1982, 1983, 1984; Locke, 1986; Housner, 1985).

Several studies are briefly highlighted to illustrate the kinds of outcomes from the work.

The Hughley (1973) study at Ohio State was the first in physical education to demonstrate that meaningful behavior change can occur during an intern experience. The central concern of this study was with the reliability and generality of a demonstrated relationship between the behavior of a student teacher and the administration of the supervision package and with the replication of this relationship in a small sample of students. (Siedentop, 1982, p. 7)

From this initial effort a series of related studies has extended the development of this experimental supervision program (e.g., Rife, 1973; Huber, 1973; Young, 1973; Boehm, 1974; Hamilton, 1974; Darst, 1974, among others). For example, Rife (1973) examined the effects of modifying student teacher behavior upon pupil behavior. Dessecker (1975) examined the effects of self assessment via tape recorded lessons on the verbal interaction of student teachers in physical education. Darst, Mancini, and Zakrjsek (1983) summarized the primary findings from experimental research on teacher behavior modification: "In general, the results of these [and other] studies indicate that a variety of techniques for developing and controlling teacher and pupil behavior can be successful" (p. 7).
Research Questions Generated by the Process-Product Program of Research

The preceding discussion provided an overview of research on teaching in physical education within the process-product program of research. Much of what has been learned from this program can be thought of as a set of "sensitizing constructs" (Bulmer, 1979) which can be used to generate questions and raise issues about current understandings of teaching and learning. Three research questions relative to the academic dimension of instruction were generated as a result of this work:

1. What is the nature of the task presentation?
2. What is the nature of students' engagement in the academic movement task?
3. What is the nature of the information communicated to students during practice?

Questions about task presentation, student engagement, and teacher feedback were raised as a result of the need for a greater understanding of the complexity of these processes and the ways in which they influence student learning in the gym. The manner in which these processes have traditionally been studied within the process-product program has yielded valuable information regarding their relationships to student learning. The kinds and levels of understandings gained have been limited, however, as a result of the narrow way these processes have been conceptualized. Research on
teaching in physical education conducted under the process-product rubric has examined if these processes (i.e., teacher and/or student behaviors) are related to student learning — as determined by statistical correlation. To date, however, this work has not examined how these processes influence what gets accomplished and what gets learned — locally in the immediate situation or context, as well as overall across a unit of instruction. Research within this program has not provided holistic descriptions of teaching and learning processes that allow sorting out the complex interrelationships among factors that influence student learning.

**Overview of Time and Learning Program**

According to Shulman (1986), a significant variation of the process-product program was the Academic Learning Time research program. Early investigators in this research tradition were seeking an indicator of teacher effectiveness they could locate in the observable performance of pupils without waiting for end-of-year achievement tests. In Berliner's (1979) words, the researchers...

... became increasingly dissatisfied with the process-product approach since it appeared that certain illogical elements were inherent in the design of a process-product study of classroom teaching. For example, how could the number or percentage of teacher verbal communications coded as praise statements in November influence results on achievement test items given in May... Researchers on the Beginning Teacher Evaluation Study [BTES] proposed a simple modification of the process-product approach to the study of classroom teaching. The modification is based on the belief that what a teacher does at any one movement while working in a circumscribed content area affects a student primarily at only that particular moment and in that particular content area. The link between teacher behavior and student achievement is,
therefore, the ongoing student behavior in the classroom learning situation. The logic continues in this way. What a teacher does to foster learning in a particular content area becomes important only if a student is engaged with appropriate curriculum content. Appropriate curriculum content is defined as content that is logically related to the criterion and is at an easy level of difficulty for a particular student. The variable used in BIES is the accrued engaged time in a particular content area using materials that are not difficult for the student. This complex variable is called Academic Learning Time (ALT).

In this conception of research on teaching, the content area the student is working on must be specified precisely, the task engagement of the student must be judged, the level of the difficulty of the task must be rated, and time must be measured. The constructed variable of ALT stands between measures of teaching and measures of student achievement. (pp. 122-125)

Academic learning time research, then, identifies "pupil pursuits" as the mediating variable between teacher behavior on the one hand, and pupil achievement on the other. Rothkopf (1970) succinctly summarizes the perspective of this research tradition: "In most instructional situations, what is learned depends largely on the activities of the student. It therefore behooves those interested in the scientific study of instruction to examine these learning activities" (p. 325). Shulman (1986) argues, however, that while the focus of ALT research on pupil pursuits is a departure from the traditional process-product program, the ALT research program maintains a fundamental family membership in the process-product program of research.
Review of Physical Education Studies within the
Time and Learning Research Program

Rife & Dodds (1983) note that "the tradition of time-on-task research in physical education, known as Academic Learning Time in Physical Education (ALT-PE), has made tremendous strides and provided valuable data for extending our knowledge base about teaching, learning, and teacher education" (p. 1). ALT-PE has been labeled as one of the more robust variables in research on teaching in physical education (Parker & O'Sullivan, 1983; Hawkins, Wiegand, & Bahneman, 1983; Tousignant, Brunelle, Pieron, & Dhillon, 1983; and Siedentop, 1983). ALT-PE research rests upon the assumption that the more time students spend practicing a motor skill at any easy level of difficulty, the more learning occurs.

"The ALT-PE observation system [or some modification of this system] has been utilized at grade levels from elementary through college and has focused on a variety of different physical education activities, both in the United States and abroad" (Rife & Dodds, 1983, p. 1). With regard to work conducted outside of the United States, the ALT-PE model has been used in Canada in the analysis of over 100 lessons at the University of Victoria in and was found to supply "a major component for evaluating effective teaching" (McLeish, 1981). Work by Brunelle, Godbout, and Tousignant at the University of Laval in Quebec has resulted in a modification of the ALT-PE system that was used to describe the behavior of students and athletes in various settings.
At the University of Otago in New Zealand, Grant has used the ALT-PE model to conduct descriptive research in physical education classes. In Australia, teacher educators such as Embrey have also utilized ALT-PE techniques. In Europe, work by Pieron at the University of Liege in Belgium and by Telama, Varstale, and colleagues at the University of Jyvaskyla in Finland has focused on the analysis of student behavior using the ALT-PE model. Finally, another "indicator of the wide recognition of the ALT-PE model comes from the fact that the concept of time-on-task was a noticeable part of three major international conferences in 1982" (Tousignant, Brunelle, Pieron, & Dhillon, 1983, p. 27).

While the ALT-PE model has found a home outside of the United States, research within the United States has likewise resulted in the application of the model to a variety of physical education settings. For example, Parker & O'Sullivan (1983) have utilized the ALT-PE model in the study of game play contexts. Aufderheide (1983) has applied the model to the study of mainstreamed physical education classes. Meanwhile, researchers such as Metzler (1983) Keller (1982) have used the model in EIU studies.

The discussion thus far has shown that tradition of ALT-PE research has been a rich and varied one. While much of the work has demonstrated that student engaged time is a primary predictor of teacher effectiveness, the results are not totally consistent. For example, the work of Rink & Werner (1985) reported earlier that was conducted within the process-product program suggested that ALT-PE was not a sufficiently powerful variable to discriminate between more
and less effective teachers when both teachers were good classroom managers. In addition, as Siedentop (1983) and others (e.g., Parker & O'Sullivan, 1983; Metzler, 1983) point out, continued refinement of the model is needed if the goal is to increase current understandings of student engaged time as a mediating variable between teacher behavior and student achievement.

Overview of Pupil Cognition and the Mediation of Teaching Program

Wittrock (1986) defines the Pupil Cognition and Mediation of Teaching Research Program as the study of

... the effects of teachers and instruction upon the student perceptions, expectations, attentional processes, motivations, attributions, memories, generations, understandings, beliefs, attitudes, learning strategies, and meta-cognitive processes that mediate achievement. (p. 297)

Shulman (1986) maintains that this program of research acts as the potential bridge between the traditional psychological perspectives of the process-product and AIT approaches and the predominantly interpretive perspectives of classroom ecology research - with its strong ties to ethnography and sociolinguistic or social interaction research. Weinstein (1983) suggests that the surge of interest in student thought and action over the past several years is the product of a "growing recognition that students influence instruction and its outcomes as much as teachers do" (p. 287).

The primary questions underlying this research program are "How do students make sense out of the instruction they encounter in the classroom?" and "What are the immediate and intermediate-term
processes engendered in students by teaching?" (Shulman, 1986, p. 16). Pupil cognition researchers are interested in the mediating processes that occur between the input of instruction and the output of achievement. The literature on pupil cognition identifies two dimensions of the complexity of classroom life for students - academic knowledge and social or interactional knowledge. These two areas - the social mediation of classroom life and the intellectual mediation of classroom life - are the two streams of mediating processes explored by researchers in this program (Shulman, 1986). Wittrock (1986) summarizes the general purpose of this research program: "Research on student thought processes examines how teaching or teachers influence what students think, believe, feel, say, or do that affects their achievement" (p. 297).

Review of Physical Education Studies Within the Pupil Cognition and the Mediation of Teaching Research Program

Two studies are highlighted to illustrate the kinds of understandings that have been gained from studies under the rubric of Pupil Cognition and the Mediation of Teaching.

Figley (1986) investigated the potential causal determinants of students' attitudes toward the physical education experience. More specifically, the investigation centered around two questions: "What aspects of the physical education experience contribute to developing positive attitudes toward physical education" and "What aspects of the physical education experience contribute to developing negative attitudes toward physical education?" (p. 230). The results indicated that "the items most frequently mentioned in relation to
both positive and negative attitudes related to the teacher and the
curriculum" (p. 229). Figley (1986), suggests that if the
development of positive attitudes toward physical education is a
valued goal, then an increased understanding of factors that
influence student perceptions is warranted.

In a similar study, Ward (1982) examined "student perception of
the learning environment . . . due to the important role
environmental perceptions have on student learning and/or the
potential for long term participation in physical activity" (p. 26).
The study investigated students' perceptions of classroom environment
at the secondary level. Further, the study examined whether male
students differed from female students in perceptions, as related to
the sex of their teachers.

Among the findings was that "teacher gender and student gender
were found to produce a number of different perceptions among the
subgroups in the sample" (Ward, 1982 p. 26). Female students taught
by female teachers perceived greater cohesion (i.e., class members
were personal friends) than did male students taught by male
teachers. Female students taught by female teachers perceived a more
suggested that one reason for this finding was that female teachers
focused on instructional aspects of teaching while male teachers
concentrated on competitiveness for motivation. Finally, "classes
taught by male teachers were perceived by male and female students as
lacking direction, disorganized, and apathetic" (Ward, 1982 p. 27).
The two studies discussed above are illustrative of the basic kinds of understandings that have been gleaned for the student mediation of teaching program in physical education.

Overview of Classroom Ecology Program

Shulman (1986) maintains that the three research programs discussed thus far "share a fundamental family membership in the process-product tradition" (p. 18). The classroom ecology program represents a clear line of departure from that tradition. This program consists of an "extended family of inquiries, not a simple, tightly knit one" (Shulman, 1986, p. 18). These approaches have alternatively been labeled ethnographic, qualitative, social interaction, constructivist, and interpretive, among others (Erickson, 1986). The parent disciplines of these approaches include but are not limited to anthropology, linguistics and sociology.

As noted by Shulman (1986), lumping these various research approaches means running the risk of placing in one broad classification what may be seen as district research enterprises. While differences exist among the approaches, when viewed collectively, the approaches comprise a family of inquiry that shares common features or elements. Central among these features is the systematic exploration of everyday life in classrooms - as interpreted by the participants in the situation (Shulman, 1986; and Erickson, 1986).

Erickson (1986) suggests five general questions that are frequently posed by those attempting to explore everyday classroom life:
1. What is happening, specifically, in social action that takes place in this particular setting?
2. What do these actions mean to the actors involved in them, at the moment the actions took place?
3. How are the happenings organized in patterns of social organization and learned cultural principles for the conduct of everyday life—how, in other words, are people in the immediate setting consistently present to each other as environments for one another's meaningful actions?
4. How is what is happening in this setting as a whole (i.e., the classroom) related to happenings at other system levels outside and inside the setting (e.g., the school building, a child's family, the school system, federal government mandates regarding mainstreaming)?
5. How do the ways everyday life in this setting is organized compare with other ways of organizing social life in a wide range of settings in other places and at other times? (p. 121)

He maintains that these questions are significant in the study of teaching for a number of reasons. The first reason concerns the invisibility of everyday life, that is, the tendency not to see the details and patterns of action of what makes daily living normal. The aphorism "The fish would be the last creature to discover water" illustrates the point of the interpretive researcher that the familiar must be made strange before the commonplace can be seen (Phillips, 1972).

A second reason the questions are significant is the need for specific understanding through documentation of details of practice. Erickson (1986) suggests that asking the question "What is happening on a general level?" is not extremely useful in sorting out complex social and instructional processes.

A third reason for the significance of these questions involves consideration of the "local meanings that happenings have for the
people involved in them" (Erickson, 1986). Behaviors and actions that look alike (i.e., have the same form) may signal different social and/or academic messages to participants.

The last two reasons concern the need for a comparative perspective in the study of classroom life. Erickson (1986) maintains that there is a need for a comparative understanding of different social settings and a need for comparative understanding beyond the immediate circumstances of the local setting. He suggests that by knowing how "what is happening here" (i.e., in this classroom) compares with other situations or classrooms, one can sort out what is idiosyncratic to the particular setting and what is generic in nature. This information contributes to a better understanding of educational practice and helps to inform change in that practice (Erickson, 1986).

The five questions suggested by Erickson (1986), and the reasons for their significance, provide a general frame for considering research conducted within this program. It is in this program of research that the present study belongs.

Review of Physical Education Studies Conducted Within the Classroom Ecology Program

Research in physical education within the classroom ecology program can be described generally as ethnographic and qualitative in nature (Locke, 1986). Two studies are highlighted to illustrate the kinds of understandings of teaching that have been gained from this program of research. The work reviewed was conducted by Wang (1977) and Griffin (1983).
In an ethnography of a physical education class, Wang (1977) found that two conflicting curricula were transmitted "independently and simultaneously in the gym class" (Wang, 1977, p. 97). These curricula were the "teacher-sponsored" and "student imposed" curricula. The teacher sponsored or ideal (Wang, 1977) curriculum was based upon such principles as cooperation, equality, and social responsibility. The student imposed or real curriculum was "one of discrimination, stratification, and segregation of individuals" (Wang, 1977, p. 97). This student subculture was based upon a complex system of social and motoric elitism. As Locke & Docks (1984) so aptly stated, "it is difficult to avoid the impression that the student operated curriculum was the center of the student experience in that physical education class" (p. 50).

Findings by Griffin (1983) also indicate the influence of student sponsored agendas on student learning. She found in a study of a middle school gymnastics class that the student interaction and participation patterns limited the opportunities to learn gymnastics in several ways. Among the findings were:

1. Serious participation in different gymnastic events was governed by the perceived sex appropriateness of the event.

2. Boys participated in 'girl appropriate' events either frivolously or reluctantly, thus limiting their own opportunity to learn by approaching many events in a nonserious way.

3. Girls' participation in 'boy appropriate' events was exploratory or reluctant.
4. Boys limited the girls' opportunity by hassling them, thus interfering with girls' serious and exploratory participation in all events but the uneven parallel bars.

5. Girls limited their own opportunity to learn by accepting boys' hassles.

6. Student self-segregation by sex within the class accentuated, exaggerated, and reinforced sex differentiated participation and interaction (p. 84).

The work of both Wang (1977) and Griffin (1983) demonstrates the kinds of understandings that can be gained of complex teaching and learning processes from research within the classroom ecology program.

Overview of Teacher Cognition and Decision Making Program

The fifth and last program identified by Shulman (1986) is teacher cognition and decision making. The purposes and rationale for this research program are identified by Shavelson (1983):

First, teachers are rational professionals, who, like other professionals such as physicians, make judgments and carry out decisions in an uncertain complex environment. . . . The conception of teachers as rational within the constraints of their information processing capabilities leads to a modification of the first assumption: teachers behave reasonably in making judgments and decisions. . . . The second assumption . . . [underlying this research] is that teachers' behavior is guided by their thoughts judgments and decisions. (pp. 392-393)

Three major genres of thought processes constitute this program: teacher planning (preactive and postactive thoughts); 2) teachers' interactive thoughts and decisions; and 3) teachers' theories and
beliefs (Clark & Peterson, 1986). Shavelson (1985) indicates that the research in this program has primarily been descriptive in nature. He suggests that considerable progress has been made over the past 10 years in increasing understandings in these areas of teaching. Shavelson (1983) suggests that the "current and future challenge for this research is to help improve teaching by using the concepts, methods, and findings [from this work] to train teachers and to provide decision aids for them" (p. 410).

Review of Physical Education Studies Within the Teacher Cognition and Decision Making Program

Three studies are highlighted to illustrate the kinds of understandings that have been gained from the work in physical education on teacher planning, decision making, and beliefs. The work reviewed was conducted by: Sherman, 1983; Placek, 1984; and Hoffman, 1983.

Sherman (1983) conducted a secondary analysis of data from each of three studies on teacher decision making (DiCicco, Housner, and Sherman, 1981; Taheri, 1982; Sherman, 1981). In his comparison of the decision-making tendencies of expert and novice teachers (n=35) during interactive teaching, the combined results from the three studies indicated that "both experts and novices tend to continue rather than change routines during interactive teaching. This tendency, however, appears stronger among experts" (p. 29). Sherman (1983) identified two critical factors that appear to influence the decision to continue or change planned routines:

a) diagnostic competence, the ability to recognize correct and incorrect response, and
b) pedagogical memory, the availability of alternative routines for making in-flight adjustments when responses are judged outside tolerable limits and changes are considered necessary. (p. 31)

This exploratory work has implications for programs of teacher education.

The work of Hoffman (1983) is related to diagnostic competence, the first factor identified by Sherman (1983). Specifically, Hoffman (1983) presents a model for the study of clinical diagnosis. Clinical diagnosis refers specifically "to decisions made by skill instructors regarding the nature of the learner's performance problems and the factors that give rise to them" (Hoffman, 1983, p. 36). Hoffman (1983) maintains that if diagnostic competence is to be acquired by teachers, then "it must be taught as a clinical skill and supported by a thoroughly integrated knowledge base that is directly related to the decisions confronting instructor" (pp. 41-42).

The last study highlighted in the program of teacher cognition and decision making is a multi-case study of teacher planning conducted by Placek (1984). The purpose of the study was to examine the manner in which four physical education teachers planned lessons. These teachers were described as providing instruction for the students, not supervising recreation. The results, which parallel those of classroom research, indicated that the classical ends/means model for planning was not used by the four teachers. Instead, the teachers used informal planning habits that typically focused on daily activities in which the students would participate.
The teachers indicated that while factors such as safety considerations, past experience, and time available influenced their planning decisions, "two factors carried the greatest weight in their decisions - the students' behavior and practical concerns about activity choice, available equipment, and class organization" (Placek, 1984, p. 45).

Student teachers' beliefs were examined in the Schempp (1986) study. The study was designed to assess the influence of the student teaching experience on physical education teachers' acceptance of responsibility for gymnasium events. More specifically, the focus was to determine the impact of student teaching on physical education student teachers' beliefs in their control over student learning outcomes. Findings included a significant decrease (p < .05) in responsibility for student outcomes and responsibility for student learning. Schempp (1986) suggests that "the results of the study appear to signal a need for both a closer analysis of and a search for alternatives to the present constitution of student learning" (p. 203).

The work reviewed in this subsection is representative of work being conducted by a small but growing number of researchers who are examining teacher decisions, plans, and beliefs. The work illustrates the kinds of understandings of teaching that have been gained from this program of research.
Summary of Five Programs of Research

The discussion thus far has examined five programs of research that have contributed to current understandings of teachers, teaching, and learning. In addition, representative studies of teaching in physical education within each of those programs have demonstrated the kinds of understandings of teaching that have been gained from the various approaches.

It is difficult to maintain that one view of classroom events is more accurate than another. Rather, we must learn from each perspective, identify matches and mismatches among perspectives, and examine relationships between perceptions and behavior. . . . By investigating several perspectives in each study, we will improve our understanding of the social reality of classrooms. (Weinstein, 1983, p. 306)

Thus, while no one program of research captures the whole, the intent in the present study was to adopt an approach that would capture as much of the complexity of life in the gym as possible. Given this goal, the approach selected was a primary one identified by Shulman (1986) within the classroom ecology program - the study of teaching and learning from a social interaction perspective.
The discussion in this section provides an indepth look at the study of teaching and learning from a social interaction perspective. The purpose of this discussion is to place the present study in a research perspective in which it can be viewed independently of, and in relation to, other studies and programs of research on teaching in physical education. In so doing, an increased understanding can be gained of what can be learned about the complexities of life in the gym from this particular perspective.

A social interaction perspective was adopted for use in the present study because it permitted a view of teaching and learning as complex social and instructional processes. In order to understand this perspective and the approach used, the conceptual framework guiding this approach must be considered. Two related purposes are served by explicating this framework: One, identification of the framework helps to define what is meant by a social interaction perspective and two, it defines the manner in which life in the physical education class was conceptualized in this study.

Identification of the Constructs

The work of Green (1983a, 1983b) has been instrumental in developing the conceptual basis of the field of the study of teaching from a social interaction perspective. Commissioned by the NIE to review the findings from the core set of 10 projects (Cole, Griffin,
funded in 1978 on the study of teaching as a linguistic process, Green (1983b) identified a series of common constructs underlying these studies. Identified in Table 1, these constructs were common to a set of studies that were grounded in a variety of different disciplines or approaches (e.g., anthropology, sociology, sociolinguistics, the study of teaching). While not inclusive (i.e., for additional information on these and related constructs see edited volumes such as Cazden, John, & Hymes, 1971; Gilmore & Glatthorn, 1982, Wilkinson, 1982; Green & Wallat, 1981; Treuba, Guthrie, & Au, 1981), when these constructs are considered collectively they provide the basis of a language for indepth descriptions of complex instructional and social processes as these processes unfold in the gymnasium and classroom. When viewed in this manner, the constructs are both products or outcomes from the research as well as the assumptions that guide observation, collection, and analysis (Green, 1983a, 1983b).

As indicated in Table 1 the twenty-four constructs were summarized under five interrelated themes. Each of these themes is discussed below. These constructs provide the basis for the study of life in the gym for a social interaction perspective.
Table 1

Constructs Underlying Studies of Teaching from a Social Interaction Perspective

<table>
<thead>
<tr>
<th>CLASSEMS ARE COMMUNICATIVE ENVIRONMENTS</th>
</tr>
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<tbody>
<tr>
<td>Differentiation of roles exist between teachers and students</td>
</tr>
<tr>
<td>Relationships between teachers and students are asymmetrical</td>
</tr>
<tr>
<td>Differential perceptions of events exist between teachers and students</td>
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<tr>
<td>Classrooms are differentiated communicative environments</td>
</tr>
<tr>
<td>Lessons are differentiated communicative contexts</td>
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<tr>
<td>Communicative participation effects student achievement</td>
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<table>
<thead>
<tr>
<th>CONTEXTS ARE CONSTRUCTED DURING INTERACTIONS</th>
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<tbody>
<tr>
<td>Activities have participation structures</td>
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<tr>
<td>Contextualization cues signal meaning</td>
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<tr>
<td>Rules for participation are implicit</td>
</tr>
<tr>
<td>Behavior expectations are constructed as part of interaction</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>MEANING IS CONTEXT SPECIFIC</th>
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</thead>
<tbody>
<tr>
<td>All instances of a behavior are not equal</td>
</tr>
<tr>
<td>Meaning is signalled verbally and nonverbally</td>
</tr>
<tr>
<td>Contexts constrain meaning</td>
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<tr>
<td>Meaning is determined by and extracted from observed sequences of behavior</td>
</tr>
<tr>
<td>Communicative competence is reflected in appropriate behavior</td>
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<table>
<thead>
<tr>
<th>INFERENCING IS REQUIRED FOR CONSERVATIONAL COMPREHENSION</th>
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<tbody>
<tr>
<td>Frames of reference guide participation</td>
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<tr>
<td>Frame clashes result from differences in perception</td>
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<tr>
<td>Communication is a rule-governed activity</td>
</tr>
<tr>
<td>Frames of reference are developed over time</td>
</tr>
<tr>
<td>Form and function in speech used in conversations do not always match</td>
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<table>
<thead>
<tr>
<th>TEACHERS ORCHESTRATE DIFFERENT PARTICIPATION LEVELS</th>
</tr>
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<tr>
<td>Teachers evaluate student ability by observing performance during interactions</td>
</tr>
<tr>
<td>Demands for participation co-occur with academic demands</td>
</tr>
<tr>
<td>Teachers signal their theory of pedagogy by their behavior (verbal and nonverbal)</td>
</tr>
<tr>
<td>Teacher's goals can be inferred from behaviors</td>
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</tbody>
</table>
The Gymnasium Is A Communicative Environment

Central to a social interaction perspective is the view that classrooms and gymnasia are dynamic communicative environments in which the events that make up everyday life in the physical education class are mutually constructed through interactions between and among teacher and students (Erickson & Shultz, 1981; Green & Wallat, 1981; Gumperz, 1981; McDermott, 1978; Erickson & Mohatt, 1982; Mehan; 1979; Sinclair & Coulthard, 1975). As participants interact with one another, information about both the social and academic dimensions of instruction is communicated (Au, 1980; Collins & Michaels, 1980; Mehan & Griffin, 1983; Wilkinson, 1982; Erickson, 1982; Green, 1983; Florio & Shultz, 1979; Green & Harker, 1982). In order to participate appropriately in the lesson, students must not only understand what is communicated about the academic aspects of instruction, they must also acquire social knowledge (Mehan, 1982; Erickson, 1982; Green & Harker, 1982). Social Knowledge is defined as knowing who can do what, where, when, with whom, and for what purposes during a "given" situation (Hymes, 1974). Mehan (1979) succinctly summarizes this dual function of communication within the classroom and gymnasium:

Students not only must know the content of academic subjects, they must learn the appropriate form in which to cast their academic knowledge. . . . They must know with whom, when and where they can speak and act, and they must provide the speech and behavior that are appropriate for a given classroom situation. Students must also be able to relate behavior, both academic and social, to varying classroom situations by interpreting implicit classroom rules. (p. 133)
When viewed from this perspective, daily events in the gym are "dynamic activities constructed by teachers and students as they process, build on, and work with their own and others' messages and behaviors" (Green, 1983b, p. 355). Lessons, then, are constructed through the interactions of teacher and students (Tannen, 1980; Gumperz & Tannen, 1979; and Erickson & Shultz, 1977).

In addition to the constructed nature of life in the physical education class, the gymnasium was seen to be a differentiated communicative environment. That is, the nature of the activity engaged in by teacher and students changes as the nature of the interaction changes (e.g., from the teacher giving information about how to play a modified volleyball game to asking students questions about the game). As activity changes, the social norms or rules for appropriate participation may also change, though change is not automatic (Florio, 1980; Florio & Shultz, 1979; Green & Harker, 1982; Merritt & Humphrey, 1981; Phillips, 1972; Wallat & Green, 1982). To illustrate, in the case of the example given earlier, students in the first activity were expected to sit and listen to the teacher, while in the second activity students were expected to call out answers to the teacher's questions.

The differential nature of the both lesson and the expectations for participation in the lesson means that "students must monitor different demands, shift ways of participation, and change behaviors to meet the situation. Life in classrooms, therefore, is dynamic and complex" (Green, 1983b, p. 187).
Contexts are Constructed Through Interactions

As indicated above, one assumption underlying a social interaction perspective is that meaning is constructed via face-to-face interaction between and among teacher and students. As participants interact with one another, social context is simultaneously being created. When viewed in this manner, context is not a given in the physical setting (e.g., volleyball court, a particular side of the volleyball court) or in the combination of persons (e.g., two students and the teacher) (Erickson & Schultz, 1981; Bloome, 1981; Green & Wallat, 1979; Gumperz, 1981, 1982; and McDermott, 1976, 1978). Context, rather, is "constituted by what people are doing and when and where they are doing it" (Erickson & Shultz, 1981, p. 148). McDermott (1976) suggests that people engaged in interaction become environments for one another. Embedded in time, these interactionally constituted environments can change from moment to moment. With each shift in context, the rights and obligations for participation may shift (Erickson & Shultz, 1981).

By observing how people hold each other accountable to what is occurring and how they signal through verbal and nonverbal actions what the activity is, the observer can begin to identify the differentiated activities that make up the everyday life of a classroom. (Green, 1983b, p. 174-443)

This view suggests that in order to conduct oneself in a manner acceptable to others in the physical education class (Goodenough, 1971) students need to know what types of verbal and nonverbal behavior are appropriate within what contexts (Erickson & Shultz, 1981; Green & Wallat, 1979, 1981). Consider the following example.
During the orientation phase of a lesson, the teacher explains to students what is going to happen during the lesson. Simultaneously with the teacher's explanation, context is being created. Rights and expectations are being defined in terms of the appropriate social behavior of the moment. Students are learning how to "look" attentive, how to get a turn to talk, the limits of acceptable behavior, and so on.

To understand what is appropriate behavior and/or action, students must interpret the teacher's contextualization cues (c.f. Cook-Gumperz & Gumperz, 1976; Corsaro, 1981; Gumperz & Herasimchuk, 1973) that co-occur with the teacher's verbal delivery of information. These are the cues that signal how a message is to be interpreted in a given context. For example, when the teacher says "Okay" to a student who has just successfully completed a jump shot from a position twenty feet away from the basket, the message can carry several different meanings to the student - depending upon the manner in which the message was delivered. It could be delivered in such a way as to signal "Good! Well done!". It could also be delivered in a way that signals "Don't shoot that far away from the basket". Contextualization cues, then, play an important role in helping both teacher and students interpret the ongoing flow of conversation and activity within the physical education class. These cues include verbal aspects (e.g., syntax and choice of words) nonverbal aspects (e.g., gesture, distance, body position, facial expression and materials) and paralinguistic aspects (e.g., pitch, stress, volume, intonation, pause [juncture] and synchrony). (Green and Smith, 1983, p. 359)
Given this view, students and teacher alike must monitor the covert messages sent by contextualization cues, as well the overt messages delivered about the social and/or academic dimensions of instruction.

As teachers and students work together during the lesson, contexts shift. As context changes during interaction, the kind of participation that is appropriate may change. For example, the context established during the orientation phase of the lesson, in which the teacher provided information about the day's lesson, is quite different from the context created as the teacher allows students to interrupt and ask questions about the lesson.

While context is constructed during interaction, not all contexts are new. When teacher and students work together across time, some contexts become patterned or routinized (e.g., taking roll, doing warm-up exercises, getting out equipment, choosing teams). For these more stable kinds of contexts, frames of reference are established (Elkind, 1979; Green & Wallat, 1982). Frames of reference allow students to enter a lesson or parts of a lesson and to predict the types of behaviors expected, the general sequences of activity . . . [e.g., call roll, go to a court, practice serves, play game, change sides] and to understand the limits to the actions that may occur. (Green, 1983a, p. 184)

To illustrate, each day when students enter the gym, they go to one of the volleyballs placed under the net and sit down. As a result of daily participation in this same routine, students have learned the expectation for participation when entering the gym. This activity, and the expectation for participation in this activity, have become a stable part of life in this physical education class. As such, it is
a predictable feature of the class. Erickson (1982b) maintains that both lessons and activities within the lesson range from being spontaneous in nature to ritualistic in nature.

**Meaning Is Context Specific**

Clearly related to the conceptualization of context as constructed is the concept of meaning as context-specific. The example given earlier of the teacher's response of "O-Kay" to the student who shot the basketball helps to illustrate the situation-specific nature of messages. The meaning the student assigns to the message is dependent upon the particular context in which the message occurs. Each message is considered to be part of the evolving conversation. The meaning given to the message is thus dependent upon the place of the message within the chain of messages in that context and the contextualization cues accompanying the message delivery (Gumperz & Simon, 1981; DeStefano & Pepinsky, 1981; Erickson & Shultz, 1981; Green & Wallat, 1979; Mehan, Cazden, Fisher, Coles, Marouler, 1976; and Merritt & Humphrey, 1981).

The "O-Kay" also example illustrates that all instances of a behavior are not functionally equivalent. Further, the "O-Kay" example illustrates that contexts constrain meaning. According to Green (1983a), given the variety of interpretations possible to the delivery of a message, not all possible interpretations are equally probable at any given point in a lesson. "The contextual surrounding of a message helps to constrain meaning" (Green, 1983a, 187).
The task of both teacher and students, then, is to continuously monitor, clarify, and make inference about ongoing behavior and action in the physical education class. As the instructional leader in the class, however, the teacher is responsible for the direction and flow of instruction (Barnes & Todd, 1977; Green, 1977; Green & Harker, 1982). Florio (1980) has argued that the only native in the classroom is the teacher. When life in the gym is viewed in the manner, the primary responsibility of the student is "to discover the cultural expectations of the teacher and to learn to act appropriately" (Green, 1983a, p. 187).

**Inferencing Is Required for Conversational Comprehension**

As was suggested earlier, when the teacher engages in interaction with students, information is transmitted relative to the social and/or academic dimension of instruction (Erickson, 1986; Cazden, 1986; Weade, 1985; and Green, 1983). The teacher can transmit information through verbal channels of communication, as well as through nonverbal channels. In addition, the teacher can simultaneously deliver information about what is expected academically (e.g., Play a two-on-two modified volleyball game) while simultaneously providing information about the social requirements for participation (e.g., Don't talk while the teacher is talking) (Erickson, 1982). To make matters even more complicated, the teacher can signal expectations directly, indirectly, or in both ways. Green & Smith (1983) maintain that:
Teachers may state the rules for participation (e.g., 'I will call on those with their hands up'), or they may reveal them through sequences of behavior (e.g., calling on students with their hands up and ignoring students who call out). Therefore, in order to participate appropriately in the evolving lesson and acquire knowledge from that lesson, students must continually monitor information from these direct and indirect messages (across verbal and nonverbal channels) in order to infer what is required. (p. 358)

Inferencing is the complex and difficult process of assigning meaning to messages delivered through verbal and nonverbal channels of communication. This process is important because the meaning a student assigns to a message determines how smoothly he or she will be able to negotiate the instructional environment.

Interpretation of the meaning of verbal and nonverbal behavior is made easier as a result of teacher's and students' patterned ways of acting in the gym. As teacher and students work together, they "monitor, infer, and clarify expectations across time and constantly draw on past experiences to determine what is happening" (Green & Smith, 1983, p. 359). These expectations guide student behavior and action and function to constrain what can and will occur. These expectations form "frames of reference for participants within and across activities, events, and settings "(e.g., Bloome, 1979; Tannen, 1979; Wallat & Green, 1982)" (Green, 1983a, p. 184). When both teacher and students have the same set of expectations for participation in activities, events, and so on (e.g., entering the gym, getting a turn at talk), a shared frame of reference exists.
A shared frame of reference facilitates, though it does not insure, appropriate participation in lesson. When the process of inferencing results in a discrepancy between the teacher's and students' perceptions of appropriate participation, or when student goals are in conflict with the teacher's goals, a frame clash results. A frame clash highlights a breach in the expectations for participation in lesson. Observation of what occurs at these breaches highlights these expectations (Cook-Gumperz, Gumperz & Simons, 1981; Green & Wallat, 1971, 1981; Heap, 1980; Mehan, 1979; Wallat & Green, 1982). For example, the manner in which the teacher deals with students interrupting her/his explanation of how to play a certain game highlights the functional rules for getting a turn at talk.

**Teachers Orchestrate Different Participation Levels**

The discussion thus far has focused primarily on the nature of the gymnasium as a communicative environment and the factors involved in teacher-student interactions. The present discussion highlights the role of the teacher in the communicative process as viewed from a social interaction perspective.

As the orchestrator and manager of the numerous messages, contexts, and levels of interaction in the classroom and gymnasium, the teacher plays a complex role that requires considerable skill in handling. Teachers must effectively communicate information about academic as well as social expectations (Mehan, 1979; Erickson, 1982; Green & Harker, 1982; Doyle, 1983), monitor and interpret student
messages, and repair frame classes (Green, 1982). Cazden (1986) succinctly points out the complexity of the teacher's role as orchestrator and manager:

Teachers create and change contexts by means of language innumerable times each day. [For example,], within the same seating arrangement of a single group of children, . . . they change the context from sharing time (with one set of rules for participation) to planning for worktime (with another set of rules). . . . The successes and failures of classroom management can be construed as largely a matter of successes and failures in subtle aspects of this kind of creative language use. (p. 435)

Green (1983b) points out that the role of the teacher also includes 1) constructing methods for moving students from activity to activity and/or place to place within lesson (Cahir, 1978), 2) arranging and monitoring groups (Collins, 1981; 1986, 1982; Hymes, 1981; Merritt & Humphrey, 1981; and Shultz & Florio, 1978), 3) monitoring and responding to different groups engaged in a variety of tasks, and 4) managing the discipline of the entire class without interrupting the flow of the immediate activity(s) in which students are participating (Merritt & Humphrey, 1981).

The vehicle for carrying out these dimensions of teaching is both verbal and nonverbal communication. The primary means of communicating, however, occurs through verbal channels (Dunkin & Biddle, 1974; and Cazden, 1986). Given this perspective, the task of teaching is a complex communicative activity in which teachers communicate their goals for the situation and their theories of pedagogy through their interactions with students (Cook-Gumperz,

Summary

The five general constructs discussed above provide the basis for the study of teaching and learning from a social interaction perspective. As indicated earlier, these constructs are both outcomes from the research and assumptions underlying the process of inquiry. The discussion now turns to a review of additional representative findings generated by work conducted within this perspective.

Representative Findings on the Study of Classroom Processes from a Social Interaction Perspective

The findings in this section are representative not inclusive. They highlight the kinds of understandings that can be gained from the study of teaching and learning from a social interaction perspective. The findings are of two general kinds. First, findings are presented on the nature of classroom communication. Second, findings are presented on selected classroom strategies or communicative patterns. The discussion of the findings draws from, but is not limited to, reviews of research on classroom processes from a social interaction perspective (Green, 1983a, 1983b; Green & Smith, 1983; and Cazden, 1986).

Findings on Classroom Communication

Findings from the study of classroom processes from a social interaction perspective provide a picture of the classroom as a rule
governed environment. Green (1983a) defines rule governed as "patterned ways of acting or patterned expectations for communicative behavior and participation" (p. 190). Research indicates that patterned behaviors or expectations act as constraints and/or supports upon what will occur, are signalled both overtly and tacitly, and assist participants in predicting what will occur generally (Bloome, 1982; Cook-Gumperz, Gumperz & Simons, 1981; DeStefano, Pepinsky, & Sanders, 1982; Erickson, 1982; Mehan, 1979; Merritt, 1982; and Wallat & Green, 1982). The discussion that follows highlights work that reflects the rule governed nature of classrooms.

One construct derived from this research is that of procedural knowledge — "knowledge of patterned ways of talking of behaving, and of interacting within instructional activities" (Green, 1983a, p. 191). To help define what is meant by procedural knowledge, findings from four research projects are presented (Bloome, 1982; DeStefano, Pepinsky, & Sanders, 1982; Erickson, 1982; and Green & Harker, 1982).

Two types of procedural knowledge have been identified by Bloome (1982) — procedural display and mock participation. Bloome (in press) defines procedural display as

... the display by teacher and students, to each other, of a set of academic and/or interactional procedures that themselves count as the accomplishment of a lesson. Procedural display may not necessarily be related to the acquisition of academic content or to learning cognitive strategies. Simply put, procedural display occurs when teachers and students are primarily concerned with displaying to each other that they are 'getting the lesson done'; — whatever academic learning occurs is at best secondary or accidents.
In procedural display, both teacher and students are concerned with completing the lesson in the appropriate sequence and with carrying out the procedures of the lesson. The primary emphasis is on getting through the lesson.

Findings by Welch (1986) from a study of instruction in a foreign language classroom help to illustrate procedural display: Students indicated in post-instruction interviews and demonstrated by their behavior during lesson that they could both avoid being called on by the teacher if they demonstrated the appropriate actions/behaviors (e.g., look down at the book, turn pages in the book, appear to be looking for something) and could get the teacher to call on them if they demonstrated the appropriate actions/behaviors (e.g., lean forward in the desk, raise one's arm very slowly as if not certain of the answer and then "shoot" it into the air). Procedural participation was used by the students in this example to "get through the lesson" with minimal interaction with the academic content.

Mock participation, the second type of procedural knowledge identified by Bloome (1982), occurs when students utilize their knowledge and understanding of the procedures and social expectations of lessons to "act as if" they know and understand the academic content of lesson. For example, Bloome (1982) describes a student who pretended to write an answer, erase it, then write again. Whenever the teacher asked the students who got the correct answer, this student raised her hand. Bloome (1982) reports that the examination of the student's work revealed that almost all of the
answers were wrong. The preceding illustration of mock participation in lesson is similar to Tousignant's (1982) concept of mock participation in physical education.

Bloome (1981, 1982, in press) maintains that the students in both examples were able to get through the lesson effectively because they were able to extract, and respond to the teacher's expectations for participation, as well as to the expectations of their peers. Green (1983a) suggests that one way to view procedural display and mock participation is that they are "patterns of interaction that can mask information about the mastery of information" (p. 191).

Two other kinds of procedural knowledge have been identified by Erickson (1982) that co-occur in the lessons and can influence appropriate and successful participation in instructional events. He suggests that teachers and students engaged in doing a lesson together can be seen as drawing on two sets of procedural knowledge - knowledge about the academic task structure and knowledge about the social participation structure of events.

Erickson (1982) defines the academic task structure as a "patterned set of constraints provided by the logic of the sequencing in the subject matter content of the lesson" (p. 154). He suggests that the academic task structure governs the logical sequencing of "instructional moves" (Erickson, 1982, p. 154) that teacher and students make. The social participation structure, on the other hand, is a "patterned set of constraints on the allocation of interactional rights and obligations of various members of the interacting group" (Erickson, 1982, p. 154). The set of constraints
governs the sequencing and articulation of interaction and it "involves multiple dimensions of interactional partnership"
(Erickson, 1982, p. 154).

What Erickson is suggesting is that there is a structure for the presentation of academic content and a co-occurring structure to the requirements for appropriate participation in interaction. Erickson's work, as well as the work of others (Au, 1980; Collins & Michaels, 1980; Cooper, Marquis, & Ayers-Lopez, 1982; Griffin, Newman & Cole, 1981; Mehan & Griffin, 1980) has shown that changes in the academic task structure have consequences for the social participation structure and vice versa. Erickson (1982) maintains that

... to the extent that talk in a lesson concerns subject matter content, successful participation in the lesson involves knowledge of subject matter information and its logical organization, as well as knowledge of discourse and its social organization. (p. 156)

The final kinds of procedural knowledge presented here come from work by Green & Harker (1982). Three types of procedural knowledge have been identified that, similar to Erickson's (1982) conception, allow consideration of the relationship between academic and social structure and knowledge. These co-occurring structures or themes are contextual themes, academic content themes, and social themes. The contextual theme focuses upon the nature of the event taking place (e.g., The teacher is presenting information about the movement task). The academic theme identifies what is being talked about - the academic content of the talk (e.g., talk about the rules of the game to be played). The social theme signals information about "who
can talk, when, and to whom the talk is directed" (Green, 1983, p. 192) (e.g., Interruptions to ask questions are/are not appropriate; It is not necessary to be called on to answer the teacher's questions).

The work by Green & Harker (1982) showed that students do not always read the cues to all three themes. Further, failure to do so can result in impairment of a student's appropriate participation in the event, activity, lesson, etc. Inappropriate participation can influence what gets accomplished and what gets learned. This work suggests that teachers must monitor carefully shifts in contextual, academic, and social demands placed on students in order to make sure that students are extracting all the cues and are appropriately involved in lesson.

The discussion thus far has highlighted the rule-governed nature of classrooms through a focus on procedural knowledge. The work reviewed demonstrates that by focusing on procedures and social/academic knowledge, researchers using a social interaction approach to the study of teaching and learning can explore the relationship between academic and social structures in classrooms, rules for participation within and across activities, and factors that support and/or constrain participation and learning (Green & Smith, 1983).

Additional findings on classroom communication highlight the nature of the classroom as a rule-governed environment in which rules are signalled both tacitly and overtly. The findings suggest that classroom activities or events have both academic and social
structures (i.e., structures for presentation of content and participation requirements) and that students are actively involved in constructing meaning within activities. Green & Smith (1983) maintain that the research emphasizes seven major points:

1) the complexity of information facing teachers and students;
2) the degree of skilled cooperation necessary to achieve mutual goals;
3) the degree of skilled performance required of both teacher and students;
4) the variety of information that must be processed;
5) the high degree of inferring required of both teacher and students; and finally,
6) the complexity of the teacher and student decision making required during activities. (pp. 337-379)

When considered as a whole, the research shows the differentiated nature of classroom learning environments, as well as the nature of the tasks involved in, and some of the skills required for, appropriate and successful participation in processes of teaching and learning from a social interaction perspective (Green, 1983a, 1983b).

**Classroom Strategies/Patterns of Communication**

Findings on patterns of communication are presented in this section. Two specific strategies are highlighted in order to demonstrate the kinds of understandings that can be gained from the exploration of classroom strategies from a social interaction
perspective. These strategies are teacher praise and student attention.

**Teacher Praise**

Work by DeStefano & Pepinsky (1981) and Morine-Dershimer & Tenenberg (1981) offers new insights into the teacher's use of praise. Findings from the DeStefano & Pepinsky (1981) study showed that statements of praise by the teacher were made twice as often as negative statements and that when students responded to questions, their replies were evaluated or accepted but not ignored. Green (1982) suggests that a clearer understanding of these findings is made possible when they are considered along side findings from the work on student perceptions of language use (i.e., See Weinstein, 1986 for an indepth discussion of research on student perceptions).

Seven general findings were gleaned from the Morine-Dershimer & Tenenberg (1981) study: 1) Students heard responses that drew teacher praise more frequently than responses that did not; 2) Students heard teachers strong praise more frequently - even though it occurred less frequently then other forms of talk; 3) both teachers and students agreed that praise was given because it was deserved; 4) significant relationships were found between defining praise as deserved and higher participation in class discussion (p < .025); 5) Significant relationships were demonstrated between entering reading pupil perceptions of praise and entry level of reading achievement (p < .01), peer status (p < .05) and status with the teacher (p < .005); 6) Questions were viewed as instructional
and praise as deserved by students of higher classroom status; and
7) The tendency of students of lower classroom status was not to
provide any definition of these events.

In a review of this work, Green & Smith (1983) suggest

... that, while the teachers in these projects used
praise frequently, praise is viewed differently by
various groups of students, is perceived by students as
serving a variety of functions, and is related to
student participation, achievement, and status.
Praise, therefore, is a differentiated process.
(p. 381)

In addition, the reviewers maintain these findings complement results
from studies of classroom management conducted within the
process-product program of research (i.e., See Brophy, 1983, and
Brophy & Evertson, 1976 for a discussion of these findings).

Attention:

The following studies generated findings on student attention:
Cooper et al., 1981; DeStefano & Pepinsky, 1981; May, 1981;
Morine-Dershimer & Tenenberg, 1981; and Merritt, 1982. The question
"What counts as giving attention?" is central to the study of this
topic. Similar to the findings on teacher praise, May (1981) found
that student attention was a complex phenomenon that varied across
contexts, by student, by teacher, and by goal or intent of the
activity. In addition, May (1981) found that constant attention was
not necessary for all learning situations,

That students can give attention without understanding
the content or the activity and that the amount of
attention required depended on the degree of attention
the teacher felt was necessary at any given time.
(Green, 1983, p. 183)
These findings demonstrate that there was little consistency in the teacher's rules for attention giving on the part of students. The complexity of the task facing students was thus increased as a result of variability in rules for attention. Given this variability, the task facing students is one of constantly monitoring each event activity, and so on to infer the requirements for participation (Green, 1983b).

These findings also highlight the complexity of role of the teacher in focusing attention. Findings from work by DeStefano and Pepinsky (1981), Griffin et al. (1981); and Merritt (1982) showed that a shared understanding of the nature of the task and rules for participation did not automatically exist between teacher and students. The role of the teacher was that of communicating the expectations for doing task and the rules for participation by directing and focusing students' attention on whatever is important to know/be able to do. The amount of attention a teacher required during instruction varied - depending upon the activity, individual child, participation structure, and the teacher (May, 1981).

Insights into the relationship of student attention patterns and student learning were provided by the work of Morine-Dershimer and Tenenberg (1981); Cooper, Ayers, Lopez, & Marquis (1981); and Cooper, Marquis, & Ayers-Lopez (1980, 1982). Their research indicates that students of different ability levels and status attend differentially to various dimensions of the teaching-learning process. For example, in the work by Morine-Dershimer & Tenenberg (1981), students of middle and low peer status attended less to other students' responses
than did students high in peer status. Finally, work by Cooper et al. (1981) demonstrated that the use of attention strategies by students during peer instruction was highly associated with positive outcomes for the peer learner (Green, 1983b).

In summary, the research on student attention has shown that from the teacher's perspective, the expectation for student attention is a variable dimension of the teaching-learning situation—depending upon such factors as teacher goals and the nature of the activity, among others. From the students' point of view, giving attention to the teacher's questions, other students' responses, teacher's praise and other salient features of classroom interaction provides information about correct answers and what is required for appropriate participation in the activity. Green & Smith (1983) maintain "that by considering what counts as attention and inattention, researchers have shown that attention is a constructed phenomenon, and a varied phenomenon that is situationally defined" (p. 383). Given these characteristics, attention "requires active monitoring on the part of both teachers and students as they participate in the every day events of classroom life" (Green & Smith, 1983, p. 383).

Summary of Social Interaction Research

The purpose of this section was to place the present study in a research perspective so that this work can be viewed independently of, and in relation to, other studies and programs of research on teaching in physical education. A social interaction perspective was selected as the approach to the research as a result of its potential
both for extending current understandings of teaching and learning
and for creating new knowledges that can add to that fund of
understanding. The discussion in the next Chapter presents the
methodology used in the study of teaching and learning from this
perspective.
CHAPTER III
METHODOLOGY

The general purpose of this study was to gain a better understanding of teaching-learning processes in physical education. This purpose suggested the need to consider the full range of approaches to the study of teaching. As discussed in Chapter II, considerations of both traditional and emergent approaches to the study of teaching led to the conceptualization of daily life in physical education as a communicative process. Both the general purpose of the study and the resulting conceptualization of the physical education class as an active communicative environment led to the primary goal of the study:

The identification of factors that support and constrain students' academic performance (i.e., motor skill performance) within and across the 14 lessons of an instructional unit on volleyball.

Three major research questions guided the process of observation and analysis of data:

1. What is the nature of the organizational structure of lessons in the volleyball unit?

2. What is the nature of the social structure of lessons in the volleyball unit, in which the academic work of lessons is simultaneously embedded?
3. What is the nature of the academic structure of the Movement Task Unit in the volleyball unit?

The way in which teaching - learning processes are studied depends upon the manner in which they are conceptualized. Both the conceptualization of the physical education class as an active communicative setting, and the physically active nature of physical education, had implications for what phenomena would be observed, how they would be observed, and how the resulting data would be analyzed. This Chapter, therefore, is a discussion of the methodology for conducting the research. Six primary areas are examined:

A) Design of the Research;
B) Locus of Observation;
C) Procedures for the Collection of Raw Data;
D) General Analytic Process;
E) Trustworthiness of the Data: An Overview;
F) Specific Procedures of Analysis/Procedures for Establishing Trustworthiness of the Data

The theoretical and methodological approach to the research — like all approaches to research — necessarily provided a partial or constrained representation of life in the gymnasium. Recognizing that any approach to research provides only one representation of the phenomenon under study, the attempt in the present study was "to collect sufficient and appropriate evidence to ensure that the description ... [obtained was] ... as accurate as possible" (Evertson and Green, 1986, p. 165). To accomplish this end
and thus answer the questions guiding the study, three primary features characterized the research methodology:

1) the interactive-reactive, or dialectical, nature of the entire research process;

2) a comparative perspective; and

3) the triangulation of findings from multiple kinds and sources of data.

The manner in which each of these characteristics influenced the nature of the evidence obtained and, thus, the representation of life in the physical education class provided, is discussed in the remainder of this chapter.

DESIGN OF THE RESEARCH

The research design was both a multi-stage and interactive-reactive process (Hymes, 1978; Corsaro, 1981; Erickson, 1986). The design was simultaneously multi-stage and interactive-reactive because there were at least five distinct dimensions or stages that composed the design and because each of these stages both built on the stages that preceded it and informed the ones that followed. Since the parts interact, decisions at any one point were grounded in prior decisions - as well as in the questions guiding the study. The diagram in Figure 1 illustrates the characteristics of the research design discussed above.

The first stage in the design involved the identification of the purpose of the study and the related research questions, as well as the basic conceptualization of the research process. During this
Conducting the Study:
Collecting Observational Records

Gaining Entry

Identification of Research Purpose/Questions; Conceptualization of the Research Process

Refine/Generate Questions

Construct and Analyze Data

Writing the Research Report

**Figure 1.** The research design.
initial stage the researcher selected a site for conducting the proposed study and developed a time line for the research. This time line is presented in Figure 2. In the second stage of the design the researcher gained entry into the school and the instructional setting of the gymnasium. The primary purposes of the gaining entry phase were to establish a good rapport with school personnel and to lessen subject reactivity to a new teacher, videotape equipment, camera operators, and the like prior to the start of instruction. During the six day, pre-study, gaining entry phase, the teacher in the study acted in the role of assistant to the regular physical education teacher. The last three days of the gaining entry phase were used to introduce the cameras and camera operators into the instructional environment.

During stage three of the research, the fourteen day instructional unit was taught and videotape and audiotape records were collected. These tapes provided the raw observational records which the researcher used to construct and analyze data in the fourth stage of the design.

As the researcher constructed and analyzed data in this fourth stage, new insights were developed and understandings were gained about what was occurring. As insight and understanding were gained, the research questions were refined and new ones were generated. This led to additional data construction and analysis and the process thus repeated itself. In such manner the research design became reflexive (i.e., interactive-reactive) in nature.
Figure 2. Time line for conducting research.
While presented in greater detail in the section on data analysis, a general model of the analytic process is described here. The model consisted of a dual level, macro and micro, analytic structure. The purpose of this structure was to develop macro and micro descriptions of daily life in the physical education class and to use these descriptions to examine the way in which life during one lesson was both similar to and different from life during other days or events. A comparative perspective was thus developed. The researcher was better able, then, to identify those demands and expectations that were generic across lessons, those that were common to a particular type of lesson event, and those that were situation specific. The identification of factors that supported and constrained student learning was therefore facilitated.

The fifth and final stage of the design involved writing the research report. This report presents the findings and conclusions from the study (i.e., Chapters IV and V).

LOCUS OF OBSERVATION

The locus of observation for the study is examined along the following dimensions: the unit of instruction, setting, and subjects.

Unit of Instruction

The study involved analysis of a fourteen day instructional unit on beginning volleyball designed and taught by the researcher. This unit of instruction was selected as a locus of observation or sampling unit for the following reasons: 1) Beginning volleyball was a generally common unit of sport study in many school physical education
programs and would thus be likely to fit in as a normal part of a
school program; 2) The unit structure represented the complete cycle
of instruction for a particular sport activity; and 3) A fourteen day
time frame was deemed appropriate from an instructional perspective.

Setting

An eighth grade, coeducational physical education class in central
Ohio was selected as the site for the study. The school was selected
due to a) the reputation of the physical education program for having a
good instructional program with expectations for achievement on the
part of the students, b) a fourteen day unit on beginning volleyball
was scheduled to be taught during the quarter in which the study was to
be conducted, and c) the willingness of the physical education teachers
and school and district administration to allow the researcher to enter
the school and conduct the study.

Subjects

Teacher

The teacher in the proposed study was also the investigator
conducting the research.

a) The teacher/researcher had thirteen years of physical
education teaching experience at various educational levels. Five of
the ten years experience in public schools were spent teaching in a
middle school, i.e., sixth through eighth grade.

b) The teacher/researcher had previous experience as a videotaped
subject during studies on teaching and learning - thereby possibly
lessening subject re-activity to being videotaped (Rink, 1983).
c) The teacher/researcher had been identified as an effective manager who maintained a high level of academic learning time (Rink, 1983).

d) The teacher/researcher was willing to identify skill development as the major goal of instruction and define the learning outcomes with respect to motor skill performance (i.e., The student will demonstrate successful use of the overhead pass and forearm pass in volleyball during modified one-on-one, two-on-two, and four-on-four cooperative/competitive practice and game play).

The dual role of teacher/researcher was both a strength and a potential problem. First, the audio and video tapes that were collected of each day's lesson were a major potential source of information to teacher-researcher that is normally not available to the practitioner in the field. Therefore, to maintain the integrity of the teaching role, the researcher's contact with each of the four videotapes and one audiotape of each lesson during the unit was limited to a 30 second to one minute check of each tape for technical problems with the taping. This procedure was adopted to insure the integrity of the teacher role and to limit bias as much as possible. Second, to insure the integrity of the researcher role and to limit bias, a series of reliability procedures were instituted. These procedures are presented later.

**Students**

The eight grade physical education class in which the study was conducted consisted of 32 students (F = 17; M = 15) students. The class population was described by the regular physical education
teacher as generally being beginning learners in volleyball. Every student had participated in a previous volleyball unit during the sixth and/or seventh grade at the middle school taught by the members of the regular school physical education staff once and possibly, though far less frequently according to the regular teacher, twice.

**Target Students**

Six target students were selected for the analysis of motor skill responses. Analysis of skill responses occurred on a post hoc unit basis. Three target students were selected from a high skilled category and three from a low skilled category.

**Procedures for the identification and selection of target students for description of motor skill responses.** Prior to the start of the study, the two members of the school's regular physical education faculty ranked each student in the class according to individual skill level in volleyball and/or overall individual skill level in physical education activities. The ranking classification ranged from one through five, with number one representing a highly skilled performer and number five representing a low skilled performer. Upon completion of the rankings and prior to the entry of the researcher into the instructional setting, the regular physical education teachers assigned students within each ranking classification to either half of the playing area in the gymnasium. Each student was required to remain in her/his assigned half of the gym for the duration of the instructional unit (i.e., Three of the four videotape recording units used to make an observational record of each lesson focused on the half of the playing
area from which the three target students were selected). All assignments were made by the regular teacher thus enabling the teacher/researcher to remain blind to prior knowledge of student ability, ranking and placement.

The preceding considerations helped to avoid researcher bias in the selection of the target students. The assignment of students to either half of the court was based upon the considerations listed below.

1) Four (n=2 females, n=2 males) of the seven high skilled students (i.e., ranked #1) and four of the eight low skilled students (n=2 males, n=2 females, ranked #5) in the physical education class were assigned to the half of the playing court from which the selection of target students was to occur.

2) A general balance in skill levels for each half of the court was sought.

3) A general balance in the number of males and females assigned to each half of the court was sought.

At the conclusion of the study, three out of the four students from each high and low skill level were randomly selected as the students. The process of random selection was performed by another physical education doctoral student at The Ohio State University to avoid potential researcher bias in selection.

PROcedures FOR THE COLLECTION OF Raw Data

The data collection process involved making permanent observational records, both audio and video, of each of the fourteen
days in the unit. The observational records were the raw data from which data were later extracted to answer the Research Questions. Data were extracted from the tapes via the dual phase micro-macroanalytic process identified earlier. These records permitted the extraction of variables grounded in recurring patterns of action and interaction in the physical education class. The following procedures were used for video and audio taping.

1. A video and audio record of each day's lesson was obtained via four videotape recording units elevated above the playing area and one audio microcassette worn by the teacher. The rationale for the use of four cameras was to provide a comprehensive and close-up view of students engaged in motor skill practice, as well as in other instructional events during the lesson. Pilot work in videotaping students' motor skill responses during physical education classes revealed the need for a finely developed videotaping technology. Three of the four cameras focused on the half of the court from which the six target students were selected for analysis of skill responses.

2. Each of three of four video recording cameras placed in the half of the gymnasium from which the target students were to be selected had the responsibility for filming a designated one-third of that playing area throughout the instructional unit. The fourth camera used a wide angle lens to obtain a record of events in the other half of the playing area.
The two procedures above provided the general framework for the collection of raw data. The procedures listed below were those specifically selected to guide the training of camera operators and the collection of raw data in the field.

**Training of Camera Operators**

Each camera operator was required to attend one of two training sessions held two weeks prior to beginning the study. The purpose of the training session was 1) to explain the purpose of the study, 2) to provide information pertinent to the camera operator, 3) to make camera assignments, and 4) to provide hands-on experience with assembling the VTR units for video-taping, making the videotape, and disassembling the units. Only two of the cameras that were used in data collection were available for use during the training sessions. Two additional units, which were similar to the unavailable units, were borrowed specifically for the training session.

Additional training session(s) were scheduled for any individual who failed to demonstrate proficiency in the operation of the camera.

**Pilot**

Two to three days after the training session all camera operators participated in a pilot camera operation session at the data collection site (i.e., the physical education class). The following procedures/guidelines were observed:

a. The four cameras used in the training session were also used during the pilot run.
b. Each camera operator was assigned a permanent location for the study.

c. Each camera operator was paired with another camera operator. The two members of the team were instructed to work together on a daily basis to set up the raised platforms/tables at each of two locations prior to assembling the VTR equipment. The pair was also responsible for removing and storing the tables after disassembling and packing the VTR units. Two of the VTR units were stored daily in a secure storage closet at the school.

d. Each camera operator was responsible for assembling, disassembling, and storing/placing the VTR equipment in the car/storage closet daily.

e. Once the camera was assembled, the camera operator was told to follow the instructions identified below:

i. Each camera was to face diagonally across the gym to the opposite corner.

ii. Each camera operator was to experiment with different tripod heights in order to determine that height which afforded the most inclusive view of the playing action.

iii. Each camera operator was to select the lens focus that allowed the most open or inclusive view of the playing action in the quadrant. The investigator then went to each camera and determined what adjustments need to be made. In order to provide for consistency in the "openness" of the camera lens, the numbers on the camera
corresponding to the desired "openness" were recorded on a card taped to the video recording deck.

f. After step C, 1-3 were accomplished, the camera crew videotaped the remainder of the regular physical education teacher's gymnastics lesson. During the last five to ten minutes of the regular physical education lesson, the students worked in pairs while cooperatively passing a volleyball back and forth. The purpose of this activity was for the researcher to gain information about videotaping needs during the kinds of conditions that would exist during the study. The students were instructed to pass width-wise across the gym from two different places on the court:

i. across an imaginary net extending lengthwise down the center of the basketball court;

ii. from any space on the court selected by the pair that would allow each individual to pass and move comfortably without 1) interfering with or 2) being interfered by any other person. The two restrictions on space used were: a) the pair must work width-wise across the gym and b) each member of the pair must be positioned within the playing space marked by the cones. During the volleyball passing activity the investigator was involved in ongoing discussions with the camera operators to determine necessary changes in taping procedures, etc.
g. The following procedures were used during the training session to insure that an audio record was made of each lesson.

i. The teacher/researcher wore a wireless microphone. A receiver was attached to each video recorder. These procedures were followed to allow audio recording on all videotapes.

ii. The teacher/researcher also wore a micro-audiocassette in her pocket. Audio recording was obtained via a microphone clipped to the shirt of the teacher.

h. Camera operators were told to remove batteries from the receivers, microphones and transmitters on a daily basis so that they could recharge overnight.

i. A pool of five batteries was used for each transmitter. Each battery was marked according to a day of the week. Batteries were rotated according to the day of the week.

j. Camera operators were told to begin recording when the first student walked out of the lockerroom.

k. A "code of appropriate behavior" for camera operators in the instructional setting was explained to camera operators. This code was implemented and observed in order to reduce subject reactivity to the VTR equipment and the camera operators during the study.

CONSTRUCTION AND ANALYSIS OF DATA

The Analytic Process: An Overview

The theoretical and methodological framework upon which the research questions were based necessitated an analytic process that was
interactive/reactive in nature. The process used in this study involved the extraction of recurrent patterns of action and interaction in the physical education class. Variables grounded in these observed patterns were then constructed. The identification of these recurrent phenomena provided the basis for generation of hypotheses regarding the nature of daily activity in the gymnasium. These hypotheses were then tested across similar and dissimilar cases using a type-case analytic approach (Erickson & Shultz, 1981; Green, 1983) (See Figure 3).

The systematic identification of patterns and the subsequent process of hypothesis generation/testing across cases provided a means of confirming/disconfirming the emergent hypotheses. The product of the identification of discrepant cases was the extraction of new phenomena and/or new questions regarding the nature of daily life in physical education. The identification of new phenomena and/or questions resulted in a repetition of the process of hypothesis generating and hypothesis testing across cases. The findings, therefore, are a product of the reactive–interactive nature of the research process.

The identification of recurring patterns and the application of a comparative perspective permitted the identification and exploration of sources of stability and change within the physical education class. This exploration resulted in the identification of aspects of daily life that were 1) generic across lessons, 2) specific to certain types of situations, and 3) idiosyncratic in nature (Erickson, 1986). Consideration of sources of stability and variability in the social and academic conduct of lesson(s) facilitated achievement of the primary
Typical Case Design

STEP 1
Select typical case of recurring activity
- segmentation
- transcription
- map construction
(Context 1)

STEP 2
Construct descriptive model of activity (Context 1)

STEP 3A
Apply model to Context 1A
(same context, different day or time)

STEP 3B
Take model to participants for validation

STEP 4A
If model not confirmed, check accuracy of description in Context 1

STEP 4B
If partially confirmed, refine model to include Context 1A and any information obtained from participants.

STEP 4C
If confirmed, go to a new context, Context 2, and build new model or apply Context 1A to Context 2

STEP 5A
Continue applying model to similar contexts/validate.

STEP 5B
If model appropriate, add context to model and continue to examine similar contexts.

STEP 5C
If model not appropriate, build new model/validate.

Adapted from Green, Harker, and Golden (in press)

Figure 3. Type-case analytic model.
goal of the study: the identification of factors that supported and constrained students' motoric performance within and across fourteen lessons of an instructional unit on volleyball.

Focus of the Observation

The conceptualization of the physical education class as both a physically active and a communicatively active environment had implications for the focus of observation. Two primary dimensions of life in the gym were selected as the focus of observation in the study, 1) the role of verbal communication in the development of meanings through face-to-face interaction between and among teacher and students and 2) the nature of students' participation in physical activity (Graham, Green, Earls, 1986). With regard to the first dimension, instruction in the physical education class occurred primarily through verbal channels of communication, that is, through an "instructional conversation" (Green, 1977; Green & Wallat, 1981). An observational focus on the instructional conversation permitted exploration of the nature of what got constructed through talk between and among teacher and students. An observational focus on the second dimension allowed examination of students' engagement in academic work and their motor skill responses while doing academic work. An observational focus on these two primary aspects of daily life, then, provided the means for the identification of recurring patterns of action and interaction in the physical education class.
The Multifaceted Approach to the Analysis of the Instructional Conversation and Students' Participation in Physical Activity

Given the complexity of life in the gym (Locke, 1974), a multifaceted approach to the observation and analysis of daily life in physical education was used in this study. This process involved the systematic analysis of both the instructional conversation of lesson and students' participation in physical activity at both a microanalytic level and a macroanalytic level. Microanalysis was conducted in four lessons—Lesson 1, 2, 8, and 12 (i.e., The rationale for the selection of these particular lessons is given in Appendix A, along with the specific methodology for conducting microanalysis of the instructional conversation). The product of microanalysis was the identification of recurring patterns of action and interaction in the physical education class.

Macroanalysis was then undertaken on selected samples of the remaining days. In comparison to the first microanalytic phase, this second phase of analysis of the instructional conversation and students' participation in physical activity was conducted on a slightly more molar scale. The purpose of the second phase was to confirm or disconfirm recurrent patterns identified during microanalysis across a systematic sample of lessons not microanalyzed.

The dual phase process of microanalysis and macroanalysis of the instructional conversation and students' participation in physical activity was the general analytic structure that resulted in the identification of factors influencing students' motoric performance. The specific data construction and analysis procedures used to answer
the individual research questions are presented on a question-by-question basis below. Prior to presenting these procedures, however, a brief overview is given of the specific methodology used in microanalysis to capture and freeze the instructional conversation of lesson so that it could be explored for recurring patterns of action and interaction.

An Overview of Mapping: The Methodology Used to Explore the Instructional Conversation

Grounded in a social interaction perspective, mapping was the specific analysis procedure used to capture and freeze the instructional conversation for analysis and reflection (Green, 1977; Green and Wallat, 1981) (An overview of the mapping methodology is given here; A full discussion is given in Appendix A). A form of discourse analysis, mapping allowed the lesson to be reconstructed in the form of a map of the unfolding lesson (See Appendix A). This map permitted systematic exploration of the meanings constructed and conveyed via verbal conversation (Graham, Green, Earls, 1986). The map, then, provided the means for extraction and exploration of patterns of interaction, and activity embedded in the interaction, in the physical education class.

Map construction was primarily a product of transcription and segmentation of the instructional conversation. The process used to transcribe and segment the instructional conversation is part of an analytic system called the Descriptive Analysis System (Green, 1977; Green & Wallat, 1981). This system is a heuristic tool that allowed a transcription of the instructional conversation between and among
teacher and students to be systematically segmented so that it could be reflected upon. That is, the system permitted the instructional conversation to be systematically frozen or layered into a hierarchy of pedagogical and conversational units and placed on a map of the lesson, known as the structural map. This hierarchy of conversational and pedagogical units is identified below and is presented in ascending order (i.e., See Appendix A for a discussion of these units and Figures 20 and 21 in the Appendix for examples of these units on a structural map):

- Message Unit
- Interaction Unit
- Instructional Sequence Unit
- Movement Task Unit
  - Task Presentation Phase
  - Student Practice/Teacher Interaction Phase
  - Transition Phase
- Phase Unit

The segmentation of talk into the hierarchy of units resulted in the identification of structurally equivalent data sets. Equivalent data sets meant that all interactions identified as a certain kind of unit represented the same category or class of phenomena and were determined in the same systematic manner each time across the 14 days of the instructional unit. Each time the researcher "looked" at a particular unit, therefore, the way in which the "looking" occurred was the same. The value of equivalent data sets was that the researcher could search for recurring patterns within and across data sets of the same class and be confident that the units compared represented the same phenomenon.
ESTABLISHING TRUSTWORTHINESS OF THE DATA: AN OVERVIEW

The quality of the contribution that any research study makes to a field of knowledge is ultimately dependent upon the trustworthiness of the data that were generated (Siedentop, 1981). Trustworthiness of the data means that the findings are credible, that is, they are worthy of belief and entitled to confidence (Earls, 1985). Lincoln and Guba (1985) suggest that determination of the trustworthiness of data is dependent upon four primary considerations:

1. "Truth value": How can one establish confidence in the "truth" of the findings of a particular inquiry for the subjects (respondents) with which and the context in which the inquiry was carried out?

2. Applicability: How can one determine the extent to which the findings of a particular inquiry have applicability in other contexts or with other subjects (respondents)?

3. Consistency: How can one determine whether the findings of an inquiry would be repeated if the inquiry were replicated with the same (or similar) subjects (respondents) in the same (or similar) context?

4. Neutrality: How can one establish the degree to which the findings of an inquiry are determined by the subjects (respondents) and conditions of the inquiry and not by the biases, motivations, interests, or perspectives of the inquirer? (p. 290)

Within both the rationalistic and naturalistic paradigms for inquiry, criteria for assessing the trustworthiness of findings have evolved in response to the questions posed above (Guba, 1981; Lincoln & Guba, 1985; Bogdan & Biklen, 1982). For the rationalistic paradigm, data that are good data are accurate, reliable, generalizable, and objective. Similarly, trustworthy data in the naturalistic paradigm are credible, dependable, transferable, and confirmable. Good data,
then, are the product of a process of inquiry to which the criteria for respected scientific inquiry have successfully been applied - as those criteria apply to both naturalistic and rationalistic paradigms (Hough & Duncan, 1986).

Given that this piece of research, like all research made public, must ultimately stand the test of scrutiny by members of the research community from both paradigms for inquiry, determination of the trustworthiness of the findings was a primary concern. Two primary methods were used to assess the trustworthiness of the data: interobserver agreement measures (Hersen & Barlow, 1976; Johnston & Pennypacker, 1980; Tawny & Gast, 1984); and triangulation of multiple sources of data (Lincoln & Guba, 1985; Miles and Huberman, 1984; Bogdan & Biklen, 1982; Hammersley and Atkinson, 1983, Guba, 1981). A discussion of the specific interobserver agreement measures is given on a Research Question-by-Research Question basis in the section below. As a result of the complexity of the data analyzed, the multiple analytic process used, and the nested nature of the information obtained in the analysis, the manner in which the triangulation of multiple sources of data contributed to establishing the trustworthiness of the findings is presented in Chapter IV.

SPECIFIC PROCEDURES OF ANALYSIS/PROCEDURES FOR ESTABLISHING TRUSTWORTHINESS OF THE DATA

In this section, specific data construction and analysis procedures are presented on a Research Question-by-Research Question basis. In addition, in those cases where interobserver agreement measures were obtained, information is provided regarding the specific
measure used, the external observer conducting the observation, the training of the observer, the procedures followed, as well as the level of agreement obtained.

Three different individuals served as external or independent observers in the study. Each of these observers was asked to serve as a coder for specific reasons. These reasons were all based upon the expertise each observer had in the area(s) for which each was asked to determine trustworthiness of the data. The qualifications of each of the observers are presented below. In the rest of this chapter, as well as in Chapter IV, these observers are referred to as External Observer A, B, C, and D.

External Observers

Observer A

External Observer A was the primary individual involved in determining trustworthiness of the data in the study. This observer was a doctoral student in Physical Education-Teacher Education at The Ohio State University. The observer had a total of 17 years previous experience in teaching physical education to children/youth in school programs and working with undergraduate physical education majors in teacher education in the university setting. The observer had successfully completed a research methodology course in which the system of microanalysis was used. Familiarity with the map of the instructional conversation assisted the observer in conducting the validation of the findings.
Observer B

External Observer B was an undergraduate senior physical education major in the Teacher Education Program at The Ohio State University. This observer was involved in the analysis of students' volleyball skill responses. The observer had an extensive background as a participant in a variety of sports in both high school and college. The observer was considered by the researcher to be a good volleyball player who had a good understanding of the game.

Observer C

External Observer C was another doctoral student in Physical Education-Teacher Education at The Ohio State University. This observer was asked to conduct a total of two agreement checks. The agreement checks were conducted on the findings regarding the major movement task, Research Question 1.3. This particular observer was asked to conduct the agreement checks because she had "expert knowledge" in volleyball. The observer was a former college volleyball coach. Also, as part of her Graduate Teaching Associate assignment at The Ohio State University, the observer had the responsibility for teaching a volleyball skills course to undergraduate physical education majors.

Observer D

External Observer D was a doctoral student in foreign language education at The Ohio State University. He was asked to conduct the agreement check on the hierarchical units. He was asked to serve as the External Observer for these units because he was simultaneously
engaged in dissertation research using the same system of microanalysis. No special training of the observer was necessary, therefore, beyond providing the definitions of the Movement Task Unit and this Unit's subparts.

Research Question 1.1.
Procedures for Obtaining Data

Data for exploration of patterns of organizational stability (Question 1.1.1) and variability (Question 1.1.2) for the 14 lessons were obtained via the multi-stage process of microanalysis and macroanalysis of the instructional conversation (See Appendix A for a full description of microanalysis).

Microanalysis of the instructional conversation was conducted for Lessons 1, 2, 8 and 12. The general steps for conducting the analysis were:

a) Obtain a rough transcription of the instructional conversation;

b) Segment the transcription into hierarchical conversational and pedagogical units;

c) Construct a map of the organizational structure of lesson using the hierarchical units identified below:
   - Phase Unit,
   - Movement Task Unit,
   Task Presentation Phase,
   Transition Phase,
   Student Practice/Teacher Interaction Phase.
Figure 4 provides an illustration of an organizational map of a lesson during the volleyball unit (i.e., Lesson 2).

Macroanalysis of the instructional conversation was conducted in all lessons not microanalyzed. The steps for macroanalysis were very similar to those for microanalysis. The difference between the two analytic procedures lay primarily in the manner in which the units were identified rather than in the nature of the information obtained. The steps for conducting the analysis were:

a) Segment lesson into Phase Units, Movement Task Units, and Phases within the Movement Task Units by simultaneously listening to and watching the videotapes (i.e., No transcription was obtained as in microanalysis; There was also no segmentation into message units, interaction units, and instructional sequence units).

b) Simultaneous with the identification of each unit, place the unit on the organizational map of lesson.

The product of microanalysis and macroanalysis was a structural map of the organizational structure of each of the fourteen lessons in the volleyball unit. Once the maps were obtained, they were searched for recurring patterns of organization within and across days. This search led to the identification of patterns of stability and change in the lesson.

Trustworthiness of the Data

Appendix A presents the specific procedures for determining trustworthiness of the identification of the hierarchical units. The
**Figure 4.** Organize
Appendix indicates that interobserver agreement was calculated on a systematically selected sample of Lesson Phase Units and a systematically selected sample of the three phase units within Movement Task Units (i.e., Task Presentation, Student Practice, Transition Phases). Interobserver agreement for each of these respective units was 100%.

Research Question 1.2: Procedures for Obtaining Data

Data relative to the distribution of time within the organizational structure of lesson were obtained in two ways. Though the methods of obtaining the data were slightly different, the kind of data obtained were identical. First, data regarding the manner in which time was spent in the four lessons microanalyzed was obtained subsequent to the identification of the various conversational and hierarchical units. Once all units had been identified via the process of microanalysis, the researcher then simultaneously followed the transcript of the instructional conversation as the videotaped record of the lesson was replayed and timed the units that were used to construct the organizational map. These units, as discussed above, were Phase Units and Movement Task Units, as well as the Movement Task Unit, the Task Presentation Phase, Student Practice-Teacher Interaction Phase, and Transition Phase within the Movement Task Unit. The researcher started the stop watch at the beginning of the first message unit for the hierarchical unit being timed and stopped the stop watch at the end of the last message unit in the hierarchical unit. The length of each hierarchical unit was recorded on the organizational map.
The second way that data were obtained relative to the distribution of time within the organizational structure of lessons occurred in the eight lessons in which macroanalysis was the process used to construct the organizational map. In these lessons the length of the various units in the organizational map identified above was determined simultaneously with the identification of the boundaries of each unit. Each unit was timed until its terminating boundaries were identified. The length of each unit was then recorded on the organizational map.

Trustworthiness of the Data

The accuracy of the researcher's timing of the length of the hierarchical units used to construct the organizational maps was assessed by External Observer A on a post hoc basis. The following units were systematically sampled to assess accuracy:

1) every other Phase Unit in lesson 1, 2, 8, and 12, beginning with the first Phase Unit in Lessons 1 and 8 and the second Phase Unit in Lessons 2 and 12 (i.e., n=7);

2) within each sampled Phase Unit that occurred in the General Physical Activity Part of the Lesson, each Task Presentation Phase, Student Practice Teacher Interaction Phase, and Transition Phase (i.e., n=15).

Interobserver agreement on the length of the units was computed using the following formula (Hersen & Barlow, 1976; Tawny and Gast, 1984; Johnston and Pennypacker, 1980):

\[
\frac{\text{Number of Agreements}}{\text{Number of Agreements} + \text{Number of Disagreements}} \times 100
\]
Agreements were those units for which both observers recorded the same time plus or minus two seconds. There was 100% agreement on the length of all units calculated at an accuracy level of plus or minus two seconds (n=59). Table 2 shows the number of Phase Units, as well as the number of each of the three phases within the Movement Task Unit, on which the agreement check was made.

Procedures for Determining Trustworthiness

Given the nature of the data for which the agreement measure was obtained, a formal observer training session was not necessary. Prior to conducting the agreement checks, the researcher briefly explained the purpose of the accuracy assessment to the observer: The purpose of the assessment was to determine the extent of agreement between the researcher and the "expert" observer on the timing of the length of the units used to construct the organizational maps. After this explanation was given, the procedures listed below were followed:

1) The observer was given a stop watch and the structural map of the instructional conversation for Lessons 1, 2, 8, and 12.

2) Instructions were given to the observer as follows: The observer was told to time the length of each individual unit in the systematically selected sample by simultaneously listening to the videotaped record of lesson and following the transcript on the structural map. The researcher told the observer that the watch was to be started at the beginning of the first message unit in the unit being timed. The observer was informed that when the terminating boundaries of the unit
Table 2

The Number of Hierarchical Units for Which There Was 100% Interobserver Agreement at an Accuracy Level of + Two Seconds

<table>
<thead>
<tr>
<th>Hierarchical Unit</th>
<th>Lesson 1</th>
<th>Lesson 2</th>
<th>Lesson 8</th>
<th>Lesson 12</th>
<th>Total Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase Units</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>Movement Task Units:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task Presentation Phase</td>
<td>12</td>
<td>6</td>
<td>1</td>
<td>3</td>
<td>22</td>
</tr>
<tr>
<td>Student Practice/Teacher Interactive Phase</td>
<td>2</td>
<td>6</td>
<td>1</td>
<td>3</td>
<td>22</td>
</tr>
<tr>
<td>Transition Phase</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

N=59
being timed were reached (i.e., as designated on the structural map), the watch was to be stopped and the length of the unit recorded (i.e., The researcher indicated that to facilitate location of the sampled units on the videotape, she would operate the videotape. The researcher stated that she would start the videotape approximately 30 seconds prior to the beginning boundaries of the unit for which accuracy was being assessed and stop the tape when the observer gave the signal and recorded the length of the unit).

3) After three-practice trials were held, the observer timed each unit in the sample according to the process identified above.

4) Once the length of all the sampled units was determined, interobserver agreement was computed using the formula presented earlier.

Research Question 1.3: Procedures for Obtaining Data

Exploration of the organizational map of each of the fourteen lessons permitted the extraction of a series of eleven recurring major movement tasks. The extraction of these tasks was accomplished according to the following steps:

1) Beginning with the organizational map of Lesson 1, the researcher recorded directly from the map the name of the major movement task for each Movement Task Unit in the lesson.

2) Step 1 was repeated for the organizational map of each lesson in the 14 day unit. A total of 17 major movement tasks was recorded. Analysis of these tasks revealed that many of the
tasks were recurring tasks and that, in fact, there were only 11 different major movement tasks that were presented by the teacher during the 14 lesson instructional unit.

Continued analysis of these tasks resulted in the identification of both commonalities and differences in the nature of task requirements. This exploration led to the construction of four inductively derived categories of major movement tasks, which formed a taxonomy of major movement tasks for the fourteen day instructional unit on volleyball. The researcher also ranked the 11 major movement tasks according to the complexity of the motoric demands placed upon students. The tasks were ranked from less complex to more complex. The rankings coincided with the chronological order in which the tasks were introduced by the teacher during the 14 lessons.

Trustworthiness of the Data

Trustworthiness of the findings was determined in two ways. First, post hoc validation of the appropriateness of the researcher's placement of the eleven major movement tasks into the four inductively derived categories was conducted by External Observer C. Second, the same observer conducted post hoc validation of the researcher's ranking of the complexity of the major movement tasks. Interobserver agreement for each of the two assessments was calculated separately using the formula below (Hersen and Barlow, 1976; Tawny and Gast, 1984; Johnston and Pennypacker, 1980).

\[
\text{Interobserver Agreement} = \frac{\text{number of agreements}}{\text{number of agreements} + \text{number of disagreements}} \times 100
\]
An agreement was recorded when there was correspondence between the researcher's placement of task in a category/ranking. The observer's rankings of the four categories, and all within category rankings with the exception of one task, corresponded to the researcher's rankings.

Procedures for Determining Trustworthiness

Given the nature of the data for which the agreement measures were being determined, formal training sessions for the observer were not necessary. The procedures that follow were used to determine interobserver agreement on the placement of the major movement tasks into the four categories.

1) The researcher placed eleven index cards on the table in front of the observer. On each card was written the name of one of the major movement tasks. The cards were given to the observer face down.

2) One by one, and in any order, the observer selected a card from the stack. The researcher then described the major movement tasks written on the card. Step two was repeated until all 11 tasks had been explained.

3) The researcher gave the observer four index cards with the name of one of the inductively derived movement task categories written on each. No explanation of the category was given beyond that given in Chapter IV. The explanation was purposefully limited so as not to bias the observer's decisions regarding placement of the major movement tasks into categories.
4. The researcher asked the observer to place each of the major movement tasks into the most appropriate category. This step was accomplished by the observer placing the index cards, on which were recorded the names of the major movement tasks, into stacks according to the most appropriate categories.

5. Interobserver agreement of the observer's rankings and the researcher's rankings was computed using the formula identified earlier (i.e., The rankings of the researcher were made during the process of data analysis).

The second procedure performed by the independent observer was to rank order the four categories of major movement tasks according to the complexity of the motoric demands placed on students (i.e., The rankings were from 1 to 4, with 1 being the least complex). The observer was also asked to rank order the major movement tasks within each category according to the degree of difficulty of the motoric demands placed on students. Interobserver agreement was computed on both the rankings of the four categories and the rankings of the major tasks within these categories.

Research Question 2.1: Procedures for Obtaining Data

Data for exploration of normative requirements for student conduct in the physical education class were obtained via a two part analytic process. The purpose of the respective parts was:

1) identification of a set of tentative normative requirements for student conduct in the physical education class;
2) verification (i.e., confirmation/disconfirmation) of tentative normative requirements/identification of additional requirements.

The product of these two parts was the extraction of a set of normative expectations for student conduct. The analytic steps that resulted in the extraction of these norms are presented below.

Part One involved a search by the researcher of the structural maps of the instructional conversation of the four lessons analyzed (Appendix A provides a detailed description of the process of microanalysis used to construct structural maps of the instructional conversations). The purpose of the investigator's search was to identify and record messages delivered by the teacher that signalled expectations for student conduct. Table 3 provides examples of message units from which expectations for student conduct were identified. The messages appeared as two general types. One type was messages that appeared to function as "proactively" delivered messages designed to introduce, establish, maintain, and/or resignal the expectation (e.g., "One of the things I expect from you is to stop whenever I blow the whistle." "Remember - when you hear the whistle blow in a few minutes, stop and listen as quickly as possible."). The second type of message that signalled expectations for conduct, on the other hand, appeared to be delivered in a "reactive" fashion. That is, the message appeared to be delivered in response to a student breach in expectations. These messages were the Potentially Divergent Units on the structural map of the instructional conversation (See Appendix A for a full description of this unit). In this latter type, expectations for conduct were
Table 3

Examples of Message Units from Which Normative Expectations for Conduct Were Derived

<table>
<thead>
<tr>
<th>Lesson</th>
<th>Phase</th>
<th>Message Unit</th>
<th>Message</th>
<th>Norm* Identification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>013</td>
<td>And then turn so that you can see and hear me.</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>106-114</td>
<td>I want you to stop very quickly, hold the volleyball, get quiet, and move to a position on the court - you don't need to come in - but move so that you can see and hear me.</td>
<td>LISTEN (<em>LOOK ATTENTIVE</em>)</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>008</td>
<td>Come out quickly and have a seat please.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>015-020</td>
<td>From now on when you come out here there will be a volleyball on the floor. Please go to that volleyball, sit down without touching it, it, and get real quiet.</td>
<td>ENTERING THE GYM/TRANSITION TO PHYSICAL ACTIVITY</td>
</tr>
<tr>
<td>8</td>
<td>5</td>
<td>428-435</td>
<td>Ready. When the whistle blows, you get started.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>126/162</td>
<td>Go/Whistle</td>
<td>START/STOP</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>543/584</td>
<td>Okay. Let's go for it./Whistle</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>4</td>
<td>124/169</td>
<td>Let's go/Whistle</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>006</td>
<td>And leave the volleyballs where they're supposed to be.</td>
<td>KEEP THE VOLLEYBALL <em>STILL</em></td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>173</td>
<td>Hold the balls please.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>756</td>
<td>Balls on the floor.</td>
<td></td>
</tr>
</tbody>
</table>

* A full explanation of norm is given in Chapter IV.
frequently highlighted whenever the teacher interacted with students who had not demonstrated the appropriate expectations (e.g., "Jay, I asked you not to talk whenever I'm talking.") Analysis of both types of messages by the researcher permitted the identification of a tentative set of normative expectations for conduct in the physical education class.

The second part of the analytic process permitted verification by the researcher of the tentative expectations as well as the potential identification of additional norms. This part involved the researcher observing the videotaped records of the actions and behaviors of students during Lessons 1, 2, 8, and 12. The purpose of the observation was verification (i.e., confirmation/disconfirmation) of the tentative norms. This verification process was accomplished by the researcher determining the congruency between the expectations that had been verbally signalled and what was actually demonstrated by students and accepted/not accepted as appropriate by the teacher. In addition, observation of students' actions and behavior permitted the identification of potential tacitly established normative expectations that had not been signalled verbally. The process of the researcher's observation of participant's actions and behavior across time, therefore, permitted testing the verbally identified, tentative expectations to determine if they were, in fact, the normative expectations for conduct in the class. This testing was, in itself, one form or one level of validation of the findings: It permitted determination if what was delivered verbally was consistent with what was actually demonstrated via students' actions and behavior.
Additional Data Construction and Analysis:
A Product of the Interactive-Reactive
Nature of the Research Process

The identification of the five norms for student conduct during the process of analysis described above resulted in additional questions being raised about one particular norm. This norm was the "Transition Efficiently Norm" (i.e., Section 2.1 in Chapter IV presents a full discussion of this norm). Questions were raised about the level of student efficiency in transitioning to practice of the major movement task. These questions led to additional data construction and analysis procedures by the researcher, as well as an additional procedure for determining trustworthiness of the findings.

To determine the level of efficiency with which students accomplished the decision making requirements and began practice, data were collected on the length of the transition time for each playing unit on alternating sides of the playing court in a systematically selected sample of Movement Task Units and lessons. The researcher timed each playing unit during the Movement Task Unit sampled from the point of the teacher's signal "Go" (i.e., given at the end of the Task Presentation Phase) to the point of completion of the organizational expectations and actually beginning practice of physical activity (Chapter IV presents a full discussion of the organizational expectations). "Beginning physical activity" was the point at which the member of the playing group that had possession of the volleyball began to lift the ball into the air to begin practice. The researcher recorded the length of time that it took each playing unit on the half
of the court for which the observation was being conducted to get started with practice during each sampled Movement Task Unit. After the researcher recorded the length of time for a playing unit, she rewound the tape, selected another playing unit on the same half of the court, and repeated the observation. This process was repeated until the length of transition time was recorded for all playing units. For each Movement Task Unit sampled, the researcher calculated the median time in seconds it took playing units to get started with physical activity.

Movement Task Units were sampled on both a microanalytic and macroanalytic basis. In the four lessons microanalyzed, Lessons 1, 2, 8, and 12, data were collected on the length of the transition time, or beginning activity time, for each playing unit on alternating sides of the playing court for each Movement Task Unit in the lesson. Beginning activity time data were also collected on a more macro, or less frequent, basis for alternating lessons not microanalyzed – Lessons 3, 5, 7, 9, 11, 14. In these lessons data were collected on the length of the transition time for each playing unit on alternating sides of the playing court for every other Movement Task Unit in the lesson. The only difference between the micro and macroanalyzed lessons, therefore, was the frequency with which the data were obtained. Across the ten lessons, playing units were observed in a total of 52 Movement Task Units. For each Movement Task Unit microanalyzed and macroanalyzed according to the process described above, the median time in seconds for beginning physical activity was calculated. The median time was calculated rather than the mean because the former was less sensitive
to outliers or extreme scores and provided a better representation of the normal or typical time for beginning practice.

**Trustworthiness of the Data**

Validation of the accuracy of the researcher's timing of the length of individual playing units' transition into practice was conducted on a post hoc basis by External Observer A. The validation process consisted of the observer timing the length of the transition into practice for each playing unit on alternating sides of the court in both the first and third Movement Task Units during Lessons 1, 7, 12, and 14. A total of eight Movement Task Units, therefore, were sampled across the 14 lesson unit. The median time for beginning physical activity by the playing units was calculated for each of the eight Movement Task Units. These eight Movement Task Units were all part of the original sample of Units in which the researcher conducted observation during the data construction and analysis process (i.e., the playing units observed by the external observer, then, were the same as those originally observed by the researcher). A comparison of the median times obtained by the external observer with the median times obtained by the researcher provided the basis for determining reliability of the findings. Table 4 shows that out of the eight Movement Tasks sampled for the accuracy assessment, there was only one in which the observer and researcher had a difference greater than plus or minus two seconds.
Table 4

Accuracy Assessment: Comparison of Observer's/Researcher's Median Time for Playing Units to Begin Physical Activity

<table>
<thead>
<tr>
<th>Lesson</th>
<th>Phase Unit</th>
<th>Movement Task Unit</th>
<th>Observer</th>
<th>Researcher</th>
<th>Difference Between Md. Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>1</td>
<td>7</td>
<td>6</td>
<td>+1</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td></td>
<td>1</td>
<td>8</td>
<td>-2</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>2</td>
<td>26</td>
<td>19</td>
<td>+7</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td></td>
<td>3</td>
<td>3</td>
<td>+1</td>
</tr>
<tr>
<td>12</td>
<td>2</td>
<td>1</td>
<td>49</td>
<td>50</td>
<td>-1</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td>3</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>14</td>
<td>3</td>
<td>1</td>
<td>67</td>
<td>65</td>
<td>+2</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td></td>
<td>3</td>
<td>17</td>
<td>-1</td>
</tr>
</tbody>
</table>

*Median time in seconds for playing units to begin physical activity during Movement Task Unit
Training of the Observer

The observer was trained to assess the length of a playing unit's beginning activity time (i.e., transition to practice) in a ten minute training session. During this session the researcher told the observer that during both the training session and the session during which the interobserver agreement measure was to be obtained, the researcher would operate the videotape and would thus locate the Movement Task Units during which the observation was to occur. The researcher also informed the observer that she, the researcher, would identify the playing unit to be observed on a unit-by-unit basis. This procedure was followed because the researcher was familiar with the students and could thus be assured that transition times were obtained for all playing units on that half of the court. The researcher explained that the observer was to start the stop watch when the teacher gave the signal to begin practice and stop the watch when the member of the playing unit who had possession of the volleyball began to lift the ball into the air to begin practice. The researcher indicated she would start the videotape approximately one minute prior to the end of the Task Presentation Phase of the Movement Task Unit in which the observation was being conducted.

The observer practiced the preceding timing procedure approximately ten times. The researcher watched as the observer practiced during these ten trials and was satisfied that the observer had accurately timed the length of the transition, that is, the time for beginning physical activity, for the individual playing units.
Procedure for Determining Trustworthiness

1. Once the researcher located on the videotape (approximately) the last minute of the Task Presentation Phase of the Movement Task Unit in which the observation was to be conducted, she identified for the observer the members of the first playing unit for which the observation was to be conducted.

2. When the observer indicated she was ready to conduct the observation, the researcher turned on the videotape.

3. While the observer conducted the observation according to the procedures defined in the training session, the researcher selected a second playing unit on the half of the court on which the observation was being held. When the observer indicated that the observation of the first unit was completed, that is, the playing unit had started practice, the researcher stopped the videotape and rewound the tape to the (approximately) same starting point in the Task Presentation Phase. Simultaneously, the observer recorded the length of time it took for the playing unit to make the transition into practice. The researcher then indicated the members of the next playing unit to be observed and the process in Steps 2 and 3 was repeated. These steps were repeated until a beginning activity time was obtained for all playing units on that half of the court for the Movement Task Unit sampled. The product of the observation was that for each Movement Task Unit sampled a list was obtained of the times for beginning
physical activity for the playing units on the appropriate half of the court.

4. Once all observations were completed, the observer and researcher worked together to calculate a median time in seconds for beginning physical activity in each Movement Task Unit sampled. These median times were then compared to the median times obtained during the original data analysis by the researcher.

Research Question 3.1: Procedures for Obtaining Data

Data for exploration of patterns of information communicated by the teacher during the Task Presentation Phase of the Movement Task Unit were obtained via the process of microanalysis of the instructional conversation of the four theoretically selected lessons (i.e., Lessons 1, 3, 8, 12). During the process of analysis, the researcher obtained data by searching the structural maps for recurrent patterns of interaction during each Task Presentation Phase in all Movement Task Units in the four lessons. Concurrent with the search of the structural maps, the videotaped record of each Task Presentation Phase was reviewed. The extraction of recurring patterns was made possible by following the steps below:

1) In Lesson 1, the researcher reviewed the videotaped record and searched the structural map for themes or patterns of information communicated by the teacher. The researcher began the search in the first Task Presentation Phase for the first Movement Task Unit in the lesson. When a pattern of interaction was identified, a description of
the pattern was recorded on a separate sheet by message unit numbers. If this pattern recurred during the same Task Presentation Phase, its corresponding message units were also recorded. Whenever a shift in topic or the kind of information that was being presented occurred, a new pattern was identified and its description recorded. The search continued in this fashion throughout the first Task Presentation Phase and in all subsequent Task Presentation Phases in Lesson 1. When the search for patterns of information in Lesson 1 was completed, analysis of these descriptions occurred in Step 2.

2) Analysis of the descriptions resulted in the identification of eleven patterns of information communicated by the teacher during the Task Presentation Phase of Movement Task Units. These patterns were constructs of action and interaction in the physical education class. These constructs were given names and thus became variables grounded in the observed interaction between and among teacher and students.

3) Following the type-case analytic model (i.e., See Figure 3 presented earlier in the chapter), the constructs extracted during Lesson 1 were tested across Lessons 2, 8, and 12. These variables were observed as recurring patterns of interaction in these lessons. In addition, two new variables grounded in two low occurring patterns of interaction were identified in Lesson 2. A total of 13 variables, or constructs of action and interaction, were identified.

Trustworthiness of the Data

As described above, the researcher inductively identified 13 categories of information presented by the teacher during the process
of analysis of the Task Presentation Phase of Movement Task Units. Post hoc validation of these constructs consisted of External Observer A testing the presence or absence of the 13 constructs during a systematically selected sample of Task Presentation Phases. Interobserver agreement was calculated using the formula below:

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

An agreement was recorded when the observer's decision on the presence or absence of each of the 13 constructs in a Task Presentation Phase coincided with the researcher's decision made during the process of analysis. The following Task Presentation Phases were sampled:

1) The Task Presentation Phase in the first and last Movement Task Unit, in both the first and last Phase Unit in the General Activity Part of the Lesson for Lessons 1, 2, 8, and 12. A total of 13 Task Presentation Phases were sampled.

Table 5 shows the interobserver agreement measures for each of the 13 constructs. This table indicates that the highest number of Task Presentation Phases in which there was disagreement on a construct was three (i.e., 73% agreement). Table 5 also shows that for three of the constructs there were no disagreements on the individual construct's presence or absence in a Task Presentation Phase (i.e., 100% agreement).
Table 5

Interobserver Agreement on the Presence or Absence of 13 Constructs of Action and Interaction in Lessons 1, 2, 8, and 12

<table>
<thead>
<tr>
<th>Construct</th>
<th>Disagreement</th>
<th>Agreement</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical Performance Element</td>
<td>0</td>
<td>12</td>
<td>100</td>
</tr>
<tr>
<td>Performance of Major Movement Task</td>
<td>1</td>
<td>12</td>
<td>92</td>
</tr>
<tr>
<td>Demonstration of Major Movement Task</td>
<td>1</td>
<td>12</td>
<td>92</td>
</tr>
<tr>
<td>Organizational Structure of Major Movement Task</td>
<td>1</td>
<td>12</td>
<td>92</td>
</tr>
<tr>
<td>Praise for Preceding Practice/Challenge for Future Practice</td>
<td>1</td>
<td>12</td>
<td>92</td>
</tr>
<tr>
<td>Use of Negative Examples</td>
<td>0</td>
<td>12</td>
<td>100</td>
</tr>
<tr>
<td>Signaling Listen Norm</td>
<td>2</td>
<td>12</td>
<td>85</td>
</tr>
<tr>
<td>Summary/Repetition of Work</td>
<td>3</td>
<td>12</td>
<td>73</td>
</tr>
<tr>
<td>Restatement of Movement Task</td>
<td>0</td>
<td>12</td>
<td>100</td>
</tr>
<tr>
<td>Choice Among Tasks</td>
<td>2</td>
<td>12</td>
<td>85</td>
</tr>
<tr>
<td>Teacher Tells Students Performance to be Monitored</td>
<td>2</td>
<td>12</td>
<td>85</td>
</tr>
<tr>
<td>Teacher Checks Performance</td>
<td>1</td>
<td>12</td>
<td>92</td>
</tr>
<tr>
<td>Teacher Guides Decision Making</td>
<td>1</td>
<td>12</td>
<td>92</td>
</tr>
</tbody>
</table>

1 Number of Task Presentation Phases in which there was disagreement on Presence/Absence of Construct.
2 Number of Task Presentation Phases in which there was agreement on Presence/Absence of Construct.
3 Interobserver agreement percent (D/A+D).
Training of the Observer

A 30 minute training session was held to train the observer for the interobserver agreement session. During the training session the researcher explained each of the 13 inductively derived constructs. After the explanation of a single construct, the researcher then showed the observer three to four examples of that construct during a Task Presentation Phase on the structural map. This process was repeated for all remaining constructs (i.e., There was one exception to this training process. The explanation of one construct required both watching and listening to the videotaped record of lesson).

During the last step in the training process the researcher identified five separate Task Presentation Phases on a structural map so that the observer could practice coding. The observer coded the presence or absence of the 13 constructs during each of these Task Presentation Phases (i.e., These Task Presentation Phases were not part of the sample for which interobserver agreement was conducted). The observer obtained a 90% level of agreement with the researcher's coding (i.e., which was done during the data analysis process).

Procedures for Determining Trustworthiness

The following procedures were used during the actual coding session for which interobserver agreement was determined.

1) The observer was given the structural map of the instructional conversation for Lessons 1, 2, 8, and 12 and a coding sheet.
2) Beginning with Lesson 1, the researcher located on the videotape, and identified on the structural map, each Task
Presentation Phase for which the coding of the presence or absence of the constructs was to occur.

3) The researcher turned the videotape on at the point of the Task Presentation Phase and the observer read the transcript on the conversational map and/or listened to the videotaped record.

4) At the end of the Task Presentation Phase the researcher turned off the videotape and the observer recorded the presence or absence of each of the 13 constructs.

5) Steps 3-4 were repeated for all sampled Task Presentation Phases. At the completion of the coding session, interobserver agreement was computed using the formula identified earlier.

Additional Data Construction and Analysis: A Product of the Interactive-Reactive Nature of the Research Process

Subsequent to the researcher's identification of the 13 constructs, questions were raised about the nature of the most frequently recurring construct. This construct was "Critical Performance Elements" (i.e., Chapter IV, Section 3.1 presents a full discussion of this construct). Questions regarding this construct led to additional data construction and analysis procedures by the researcher, as well as an additional process of validation of the findings.

The researcher obtained data for exploration of the construct "Critical Performance Cues" by reentering the structural map of the
instructional conversation in Lessons 1, 2, 8, and 12 at the point of
the Task Presentation Phase in all Movement Task Units in which this
construct appeared. Once the structural map was reentered, data were
obtained by searching for message units where critical performance
elements were identified. Beginning with Lesson 1, therefore, critical
performance elements were extracted and recorded for each Movement Task
Unit in which the construct appeared in the four lessons. Thus, data
were obtained relative to both the specific critical performance units
that were identified by the teacher and the frequency with which each
appeared in Task Presentation Phases across the four lessons analyzed.
Thirteen critical performance elements were identified. Analysis of
these elements resulted in the identification of three categories of
critical performance elements.

Trustworthiness of the Data

Post hoc validation of the appropriateness of the researcher's
placement of the critical performance elements into these categories
during the process of analysis was conducted by External Observer C.
This observer was the same "expert observer" who conducted the
validation process for the placement of the major movement tasks into
categories and ranking of the major tasks according to their motoric
complexity. The validation process consisted of the observer taking
the 13 critical performance elements and placing each into one of the
three inductively derived categories. Interobserver agreement was
calculated using the formula identified below:

\[
\frac{\text{number of agreements}}{\text{number of agreements} + \text{number of disagreements}} \times 100
\]
An agreement was recorded when there was agreement on the placement of the critical performance element into a particular category. There was agreement on the placement of all 13 critical performance elements with one exception. Interobserver agreement, then, was calculated at 92%.

**Procedures for Determining Trustworthiness**

Given the nature of the findings to be validated, it was not necessary to hold a formal training session for the coder. A measure of interobserver agreement was obtained by following the procedures below:

1) The researcher gave the observer three index cards. On each of the cards was written the name of one of the three categories of major movement tasks. The researcher explained the three categories of critical performance elements to the observer according to the descriptions given in Chapter IV.

2) The researcher gave the observer 13 index cards. Listed on each card was the name of one of the 13 critical performance elements. Given the observer's "expert knowledge", and the fact that the performance elements were, for the most part, self-explanatory, little explanation was needed. The researcher told the observer to seek clarification of any performance element that was unclear. The observer sought clarification of four critical elements.

3) The researcher asked the observer to group the index cards on which the critical performance elements were written according
to the appropriate index card on which the name of the
category was written.

At the completion of the validation session, interobserver agreement
was computed following the formula identified earlier.

Additional Data Construction and Analysis: A Product of the
Interactive-Reactive Nature of the Research Process

Identification of the thirteen constructs of action and
interaction in the physical education class provided information about
what got communicated by the teacher during the Task Presentation
Phase. To determine the effectiveness of communication, that is, to
determine whether this information resulted in the appropriate
performance of academic work by students (i.e., as stated by the
teacher), the researcher obtained information about students' initial
engagement in practice of the academic movement task. "Initial"
referred to the period of practice at the start of the Practice Phase
during which a playing unit made the first three skill responses. A
playing unit consisted of the individuals who worked or practiced
together during the Student Practice Phase of a Movement Task Unit.

The researcher obtained data for exploration of students' initial
engagement in academic work by determining whether or not students'
efforts at practice met the teacher stated specifications of the major
movement task. For example, if the teacher stated that the major
movement task was a two-on-two task, in which each pair was to play in
an up-back formation and in which play was to start with an overhead
pass to the other side of the net, then observation focused on whether
or not the playing unit demonstrated these specifications when the first three skill responses were made.

To obtain data relative to students' initial engagement in academic work, the specific procedures identified below were used to guide the observation.

1) The researcher located on the videotaped record the start of the Student Practice Phase during which the observation was to be conducted.

2) When the videotape was turned on, a playing unit was selected for observation. The playing unit was observed for the duration of its first three skill responses and the videotape was stopped or rewound/replayed for another viewing(s).

3) The researcher decided whether the members of the playing unit were appropriately or inappropriately engaged initially. All of the members of the playing unit were considered to be appropriately engaged initially if the first three skill responses occurred under conditions that met the specifications of the major movement task. All members of the unit were considered to be inappropriately engaged initially if two out of the three skill responses made by any member(s) of the playing unit did not meet task specifications. If only one out of the first three responses was not made under the stated task conditions, the playing unit was observed for three additional skill responses. The members of this playing unit were coded as appropriately engaged initially only if all three skill responses occurred under the stated task conditions. In addition, the members of the playing unit were not considered to be appropriately engaged initially if less than three
skill responses were made during the time allocated for practice. Regardless of whether the members of the playing unit were appropriately or inappropriately engaged, the names of all members of the unit were recorded (i.e., The total number of students observed during the Practice Phase was also recorded).

4) The videotape was rewound, and Steps 1-3 were repeated until observation was completed on all playing units during the Movement Task Unit.

The steps that preceded guided the process of observation of students' initial engagement in academic work during each Movement Task Unit in Lessons 1, 2, 8, and 12. In such a manner, a record was obtained of the number and names of students who were initially appropriately and inappropriately engaged in the practice of the major movement task for each Movement Task Unit in the four lessons.

**Trustworthiness of the Data**

Validation of the researcher's coding of students' initial engagement in practice of the major movement task was conducted on a post hoc basis by External Observer A. The validation process consisted of the observer coding the initial engagement of a systematically selected sample of students in every other Movement Task Unit (i.e., n=18) in Lessons 1, 2, 8, and 12 (i.e., This sample was part of the original data set analyzed by the researcher during the course of the study). The sample of students consisted of one high skilled student, two medium skilled students, and one low skilled student (i.e., n=4). The names of these students were randomly
selected by the observer from three separate lists prepared by the researcher of the high, medium, and low skilled students in the physical education class. As described previously, the skill rankings had been made by the school's regular physical education teacher prior to the onset of the study.

Interobserver agreement was calculated using the formula below for event data:

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

An agreement was recorded when the observer's decision on appropriate/inappropriate engagement was the same as the researcher's decision made during the process of data analysis. Of the 71 instances where initial engagement was coded, there were 61 agreements and 10 disagreements (i.e., there should have been 72 instances of initial engagement. One of the students being observed could not be located on one of the four cameras). Interobserver agreement was computed at 86%.

**Procedures for Determining Trustworthiness**

Observer training for validation of students' initial engagement, as well as level of engagement, was held in the same training session. A discussion of this training process, therefore, is reserved for the section on engagement patterns.

**Research Question 3.2.1:**

**Procedures for Obtaining Data**

Data for exploration of patterns of student engagement in the academic movement task were obtained from the videotaped records using
a series of data construction and analysis steps. Step 1 involved writing a systematic description on a student-by-student basis of the observed engagement in Lessons 1, 2, 8, and 12 - the microanalyzed lessons. This description was the product of the systematic observation of individual students during the Practice Phase of each Movement Task Unit in Lessons 1, 2, 8, and 12. During the observation, brief field notes were taken, as well as methodological, research, and/or theoretical notes (Corsaro, 1981) when appropriate. Field notes were recorded according to the following manner:

1) No notes were recorded whenever the student being observed appeared to be participating in physical activity in a manner consistent with the teacher's academic work expectations;

2) Whenever the student's participation varied from the stated work expectations, in terms of either the performance of the major movement task or actions/behavior related to the performance of that task, then the student's name was recorded. In addition, brief field notes were recorded that described the manner in which the student's participation varied from the stated work expectations.

The observational procedures described here were followed for each student, in each Practice Phase, of each Movement Task Unit in Lessons 1, 2, 8, and 12. Completion of this step led to the analysis of patterns of student engagement in Step 2. In Step 2, analysis involved a systematic search for recurring patterns of student engagement. The search for recurrent patterns of interaction led to the identification of four categories of student engagement in academic work. These four
categories derived from the recurring patterns are presented below, as well as in Chapter IV, as part of the findings. The categories are presented in this Chapter because they provided the basis for obtaining data to answer other research questions.

1) consistently engaged
   The student consistently demonstrated performance of the major movement task and appropriate behavior/actions related to performance of that major task (e.g., retrieving balls, getting into groups, deciding boundaries).

2) mostly engaged
   Most, but not all, of the time the student demonstrated performance of the major movement task and appropriate behavior/actions related to performance of that major task.

3) partially engaged
   The student occasionally demonstrated performance of the major movement task and appropriate behavior/actions related to performance of that major task.

4) rarely engaged
   The student rarely, if at all, demonstrated performance of the major movement task and appropriate behavior/actions related to performance of that major task.

The manner in which these categories were extracted from the data is described below.

Categories were derived by considering the nature of student's participation in the academic movement task of lesson. When this interaction was examined on a movement-to-moment basis, and then
considered across the interval of the movement task Practice Phase, the four conceptual categories of engagement were identified. These categories also formed a taxonomy that was applied to the analysis of student engagement.

Step 3 involved analysis of student engagement across lessons using the Taxonomy of Categories of Student Engagement. This analysis involved a two part process. Part 1 consisted of microanalysis of student engagement in the academic major movement task during the Practice Phase of the Movement Task Unit. This part involved using the four categories of the taxonomy to code student's participation in the Practice Phase of each Movement Task Unit during lessons that were microanalyzed (i.e., Lessons 1, 2, 8, and 12). Each student visible on one of the four videotapes was observed by the researcher for the interval of the Practice Phase of each Movement Task Unit in the lesson. Replay of the videotaped Practice Phase occurred from one to three times for each student. During the observation the researcher made written notes about what the student was doing during practice (e.g., what the student did at points of transition, how much effort the student seemed to be putting into his/her practice; modifications made in physical organization of movement tasks, etc.). Consideration of such information across the interval of the Practice Phase of the Movement Task Unit provided the basis for identifying the level of engagement of each student. Thus, each student in the class visible on one of the four videotapes was coded as either consistently engaged in the major movement task, mostly engaged, partially engaged, or rarely engaged for each Movement Task Unit in Lessons 1, 2, 8, and 12. From
these codings, then, a record was made of the level of engagement of each student in the physical education class. This record was called the **Student Engagement Profile**.

Part 2 consisted of macroanalysis of student engagement in the major movement task during the Practice Phase of the Movement Task Unit. This part involved coding each student's participation in physical activity in lessons on Day 3, 5, 7, 9, 11, 13, and 14. While data for the first part consisted of classification of students' participation in the major movement task according to one of the four categories, student engagement on these days was coded on a broader level using only two categories: consistently engaged (Category 1) or not consistently engaged (Category 2, 3, and 4). This modification was used so that confirmation/ disconfirmation of the patterns obtained from microanalysis could be determined without continuation of the detailed microanalysis. The lessons selected for macroanalysis were a systematically selected sample of alternating lessons beginning with Lesson 3. The last lesson was also analyzed. From within these alternating lessons, a systematically selected sample of students and Movement Task Units was likewise obtained. Specifically, student engagement measures were obtained for students on one half of the playing court for alternating Movement Task Units beginning with the first Unit. The last Movement Task Unit in the lesson was also part of the sample. Finally, the side (i.e., half) of the court on which macroanalysis was conducted alternated in each lesson. The systematic sampling process reviewed above provided a representative sample of
lessons, Movement Task Units, and students for macroanalysis of student engagement.

The process of microanalysis and macroanalysis, then, involved coding the level of students’ engagement in the academic movement task. The product of this two part analytic process was the construction of a record of the level of engagement of each student in the Movement Task Units during the ten lessons sampled. As indicated earlier, this record was called the Student Engagement Profile. Data were obtained from the Profile by determining the percentage of students consistently engaged in the major movement task (i.e., Category 1) for Movement Task Units in all lessons microanalyzed and macroanalyzed. Data were also obtained by determining the percentage of students engaged in Category Two, Three, and Four respectively for each Movement Task Unit in the four lessons microanalyzed.

**Trustworthiness of the Data**

Validation of the researcher's coding of the level of students' initial engagement in the academic movement task was conducted on a post hoc basis by External Observer A. The validation process consisted of the observer coding the level of engagement in academic work for a systematically selected sample of students (n=4) in a portion of these Movement Task Units (n=22) in which the researcher's original analysis had been conducted. Interobserver agreement was computed using the formula identified below for event data:

\[
\frac{\text{number of agreements}}{\text{number of agreements} + \text{number of disagreements}} \times 100
\]
Agreements were recorded when the researcher and observer agreed upon the level or category of student engagement in work. Of the 87 instances of engagement coded, there were 70 agreements and 17 disagreements. Interobserver agreement was computed to be 80% on the coding of student engagement in work according to the four categories. In addition, because the agreement measure was determined across four different categories, rather than within each category, an error or disagreement analysis was also conducted to determine where the sources of disagreement were located (See Table 6). The analysis table shows that in 10 of the 17 disagreements, the researcher coded a lower (i.e., poorer) level of engagement than the observer. The lower rating suggests that the tendency of the researcher was that of being less likely to accept/code engagement high unless student behavior/actions warranted a higher coding.

As indicated in the preceding section (3.1), validation of the findings regarding the level of work engagement was conducted by the same external observer who validated the findings regarding the initial student engagement in practice of the academic movement task. These two validation procedures were conducted during the same session. The sample of students selected for observation of initial engagement and level of engagement was the same in both instances -- one low skilled, two medium skilled, and one high skilled students. In addition, the systematically selected sample of Movement Task Units (i.e., alternating Movement Task Units in Lesson 1, 2, 8, and 12) was the same. The only difference was that Lesson 3, a macroanalyzed lesson, was added to the sample of lessons in order to determine
### Table 6

**Analysis of Seventeen Disagreements Between Researcher and External Observer During the Post Hoc Validation of Student Engagement Findings**

<table>
<thead>
<tr>
<th>Observer's Coding</th>
<th>Researcher's Coding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partially Engaged</td>
<td>Mostly Engaged</td>
</tr>
<tr>
<td>Rarely Engaged</td>
<td>Partially Engaged</td>
</tr>
<tr>
<td>Mostly Engaged</td>
<td>Partially Engaged</td>
</tr>
<tr>
<td>Consistently Engaged</td>
<td>Mostly Engaged</td>
</tr>
<tr>
<td>Mostly Engaged</td>
<td>Partially Engaged</td>
</tr>
<tr>
<td>Mostly Engaged</td>
<td>Partially Engaged</td>
</tr>
<tr>
<td>Partially Engaged</td>
<td>Rarely Engaged</td>
</tr>
<tr>
<td>Partially Engaged</td>
<td>Mostly Engaged</td>
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<tr>
<td>Mostly Engaged</td>
<td>Partially Engaged</td>
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<td>Partially Engaged</td>
<td>Mostly Engaged</td>
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<tr>
<td>Rarely Engaged</td>
<td>Partially Engaged</td>
</tr>
<tr>
<td>Partially Engaged</td>
<td>Mostly Engaged</td>
</tr>
</tbody>
</table>
trustworthiness of the findings obtained via the macroanalytic process.

**Procedures for Determining Trustworthiness**

An observer training session was held to train the observer to code first, a student's initial engagement in practice as appropriate or inappropriate, and second, a student's level of engagement in practice according to the appropriate category in the Task Engagement Taxonomy. The basic steps in the training were the same for both aspects of engagement. The steps for training the observer to code a student's initial engagement in task were as follows:

1) The researcher defined initial engagement and appropriate/inappropriate engagement for the observer as indicated earlier in this section.

2) The observer viewed instances of both appropriate and inappropriate engagement in practice on the videotape. The researcher provided an explanation regarding why each student observed was not as well as was appropriately or inappropriately engaged.

3) The observer practiced coding cases of appropriate and inappropriate engagement.

The steps that preceded were the same basic steps used to train the observer to code a student's level of engagement, and therefore, are not repeated here.

**Protocol for Coding Session**

The researcher explained the protocol for the coding session to the observer. The protocol called for the researcher to operate the
videotape recorder and locate/identify for the observer all students in the sample to be coded. In addition, the researcher gave the observer the map of the instructional conversation for each lesson in which the observation was to occur. This step was necessary so that the observer could read the transcript and extract the teacher stated expectations for practice of the major movement task (I.e., Prior to conducting observation during a Practice Phase for a Movement Task Unit, the researcher located the Task Presentation Phase on the map for the observer).

Once the observer indicated she was ready to begin the observation, the steps below guided this process. The observer coded initial task engagement first and then level of task engagement for each student in the sample of students selected for the validation process.

1) The videotape was turned on approximately 30 seconds prior to the teacher's signal to begin practice (I.e., given at the end of the Task Presentation Phase).

2) The researcher identified the playing unit to be observed (I.e., The unit to be observed was the one in which the high, medium, or low skilled student in the systematically selected sample was a member).

3) The coder observed the playing unit until it had completed three skill responses. The videotape was turned off. Upon request by the observer, the tape was replayed.

4) Based upon the definition given earlier, the observer coded all members of the playing unit as appropriately or inappropriately
engaged. Step 5 marked the beginning of the coding process for level or category of engagement.

5) The videotape was rewound to its approximate starting point and played for the duration of the Practice Phase. During this time the observer made brief written notes regarding the observed student's actions and behavior (i.e., The same student whose playing unit was observed for initial engagement was observed for category of engagement).

6) At the end of the Practice Phase the videotape was turned off. Upon request by the observer, the tape was replayed.

7) Based upon the definitions of the task engagement categories given earlier, the student's level of engagement was recorded.

8) The tape was rewound to its approximate starting point in the Task Presentation Phase.

9) Steps 2-8 were repeated until the observer had coded both initial task engagement for each playing unit in which the sampled student was a member and level of engagement for each sampled student. When all observations were completed, interobserver agreement using the formula identified earlier was computed on both aspects of engagement.
Research Questions 3.2.2 and 3.2.3:
Procedures for Obtaining Data

Data for exploration of patterns of student efforts at modification of the major movement task (i.e., at not being consistently engaged in practice) and teacher response to these efforts were obtained via the repeated observation of the actions and interactions of students across time during the Movement Task Unit. Points of reentry into the Movement Task Unit to conduct the observation were provided by data obtained to answer other research questions. Identified below, these data became points of hypothesis generation and testing within the Movement Task Unit to provide information regarding what was occurring with respect to students' attempts to modify task. These points of reentry permitted qualitative examination of factors that contributed to task modification.

Two primary sources of data provided points of reentry into the data and thus informed the findings for the two interrelated research questions in this section. The primary source of data came from the coding and analysis of students' engagement in the major movement task during the Practice Phase of the Movement Task Unit. The construction and analysis of data for Research Question 3.2.2 occurred via the multi-stage process of microanalysis and macroanalysis of students' participation in physical activity. The product of this analytic process was the construction of the Student Engagement Profile. (A discussion of the procedures for the construction of the Student Engagement Profile was given in Section 3.2.1 in this Chapter).
While the Student Engagement Profile provided a record of each student's level of engagement in the Movement Task Unit, it simultaneously provided a record of those students who modified the teacher stated academic movement task as a result of not being consistently engaged during practice for the 71 movement tasks in the ten lessons sampled. The Student Engagement Profile was thus the first and a primary source of data for exploring questions about the nature of task modification and identifying factors that influence the nature of students' engagement in academic work.

The second major source of data for Research Questions 3.2.2 and 3.2.3 was data obtained from microanalysis of the instructional conversation. Two primary types of data provided points of reentry. First, microanalysis of the instructional conversation during the Task Presentation Phase of the Movement Task Unit (Section 3.1) permitted the identification of a pattern of teacher communication — teacher restatement of the immediately preceding movement task. As discussed in Chapter IV, Section 3.1, this strategy was sometimes linked to students' modification of task. Second, analysis of the instructional conversation during the Practice Phase of the Movement Task Unit (Research Question 3.2.4) permitted the extraction of a pattern of feedback associated with students' attempts to modify work expectations: feedback in which the teacher individualized movement tasks. This pattern was also associated with student attempts to modify academic work.

The Student Engagement Profile and the two preceding sources of data thus provided points of hypothesis generation and testing.
Research Question 3.2.4: Procedures for Obtaining Data

Data for exploration of patterns of information communicated by the teacher during the Student Practice/Teacher Interaction Phase of the Movement Task Unit were obtained from the structural maps and raw videotaped records using a series of three data construction and analysis steps. Step 1 involved writing a systematic description on an interactive episode by-interactive episode basis of information communicated during the Practice Phase of Movement Units in Lessons 1, 2, 8, and 12. The interactive episode, defined fully in Appendix A, was the primary unit of analysis.

Analysis of the interactive episode in this first step began with Lesson 1. The investigator began the search with the first interactive episode in the first Student Practice/Teacher Interaction Phase of the first Movement Task Unit in the lesson. The interactive episode was reviewed via observation of the structural map and videotaped record of lesson. Brief notes were written regarding the nature of what got communicated during each episode. When the review of the first episode was completed, the process continued with each
successive episode until all episodes in the lesson were reviewed and notes were made.

Completion of the preceding step led to Step 2, a search for recurring patterns of information. In this step, the notes written in Step 1 were systematically reviewed across the lesson, which led to the identification of six recurring patterns of information. Six categories of information were extracted that were communicated by the teacher during interactive episodes in the Practice Phase of Movement Task Units. Following the type-case analytic model, the categories extracted during Lesson 1 were tested across Lessons 2, 8, and 12. These categories or variables were also identified as recurring patterns of interaction in these lessons. In addition, one new variable was identified in Lesson 2. Lesson 1 was reviewed to test the presence or absence of this category of information. No interactive episodes were identified in which this category of information appeared.

Step 3 consisted of analysis of information communicated by the teacher during the interactive episode. This step involved using the seven categories of information to code each interactive episode in the Practice Phase of each Movement Task Unit in Lesson 1, 2, 8, and 12. Multiple coding of the episode was allowed. The steps below guided the process of analysis.

1) The researcher recorded on a coding sheet the message unit numbers corresponding to each interactive episode in each Movement Task Unit in the four lessons.
2) Using both the raw videotaped record and the structural map, the researcher reviewed the first interactive episode in Lesson 1. The episode was reviewed as often as was necessary for the researcher to make a decision regarding the category(s) of information contained in the episode (i.e., Multiple coding of interactive episodes was allowed).

3) Once a decision was made, the category was recorded on the coding sheet beside the appropriate message unit numbers.

4) Steps 1-3 were repeated across all interactive episodes in Lessons 1, 2, 8, 12. Thus, each interactive episode in the four lessons was coded according to one or more of the seven categories - depending upon the type of information contained in the episode. Analysis revealed that only rarely was an interactive episode coded as having more than one category of information.

Trustworthiness of the Data

As indicated above, each interactive episode in Lesson 1, 2, 8, and 12 was coded according to one or more of the seven categories inductively identified during the process of analysis. Post hoc validation of the appropriateness of the coding of the episodes consisted of External Observer A coding a systematically selected sample of interactive episodes according to one or more of these seven categories. Interobserver agreement was computed using the formula below:

\[
\frac{\text{number of agreements}}{\text{number of agreements} + \text{number of disagreements}} \times 100
\]
An agreement was recorded each time one or more of the categories identified by the observer for a particular episode was the same as that identified by the researcher during the third part of the data analysis process (i.e., it has already been noted that an interactive episode was infrequently coded as having more than one category of information). The sample for validation of the findings consisted of the first four interactive episodes in every other Movement Task Unit for each Phase Unit in the General Activity Part of Lessons 1, 2, 8, and 12, or 51 episodes. These 51 episodes had been coded by the researcher as containing a total of 63 categories of information.

Table 7 shows the distribution of agreements and disagreements (and corresponding interobserver agreement measures) for each of the seven categories. The table shows a range of percentage of agreement from 45% to 100%. When the "Applied Task Feedback" category (i.e., the category with a 45% measure of agreement measure) was omitted from consideration as one of the seven categories, the range was from 78% to 100%, with four of the categories having measurements of agreement of 100%.

Given the low level of interobserver agreement on the "Applied Task Feedback" category, the researcher and observer discussed reasons why there was such poor agreement on the identification of this category. Two primary reasons were identified. One, there was lack of explicitness in the definition of the category. Two, the examples of this category that were shown to the observer during the training session were very clear instances of the category, while the interactive episodes systematically selected for the interobserver
Table 7

Number of Agreements and Disagreements Between Researcher and Observer for Each Category of Information Presented by the Teacher During the Student Practice/Teacher Interaction Phase

<table>
<thead>
<tr>
<th>Category of Information</th>
<th>No. of Agreements Between Observers</th>
<th>No. of Disagreements Between Observers</th>
<th>Interobserver Agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rapid Fire Task</td>
<td>8</td>
<td>1</td>
<td>89%</td>
</tr>
<tr>
<td>Driven Feedback</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individual Performance</td>
<td>7</td>
<td>2</td>
<td>76%</td>
</tr>
<tr>
<td>Driven Feedback</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Applied Task Feedback</td>
<td>11</td>
<td>9</td>
<td>45%</td>
</tr>
<tr>
<td>Student Engagement</td>
<td>4</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>Organizational Structure</td>
<td>7</td>
<td>2</td>
<td>78%</td>
</tr>
<tr>
<td>of the Movement Task</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Providing Clarification</td>
<td>1</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>About Academic Work</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individualization of</td>
<td>2</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>the Movement Task</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>40</td>
<td>14</td>
<td>74%</td>
</tr>
</tbody>
</table>
agreement session were not nearly as clearly defined. The observer and researcher agreed that a category of "Applied Task Feedback" did exist as a category of information presented by the teacher, but that the two reasons above prevented an acceptable level of agreement being reached.

Procedures for Determining Trustworthiness

A 60 minute training session was held to train the observer for coding during the interobserver agreement session. Observer training was a three part, multi-step process. In Part 1, the researcher briefly explained each of the seven categories of information. The next Part of the session consisted of a series of steps designed to train the observer to discriminate between and among the various categories. The researcher began by verbally describing the most frequently occurring category of information to the observer. The description of this category was the same as the descriptions provided in Chapter IV. After the category was explained, the researcher then used the structural map and videotaped record to show the observer three to four examples of interactive episodes in which that category appeared. Non examples of interactive episodes (i.e., episodes that did not contain that category) were also shown. The researcher and observer discussed reasons why the episode was coded as an instance of that category and why it was not coded as occurrences of other categories. Finally, the observer was given five to ten episodes for which to code the presence or absence of the category.
The multi-step process described above was repeated for each of the remaining six categories of information. In the third and final part of the training session the observer practice coded approximately 15 interactive episodes according to the seven categories of information. The episodes selected for coding during the training session contained each category a minimum of one or more times.

Protocol for Coding Session

The steps below interobserver agreement on the coding of the interactive episodes.

1) Using the structural map, the observer read the transcript of the Task Presentation Phase prior to observation of interactive episodes in any individual Practice Phase (i.e., In each instance, the researcher located the Task Presentation Phase on the map for the observer). This step was an important step because the identification of three of the categories of information required knowing what the teacher stated task requirements were.

2) The researcher located on the videotaped record approximately the last 30 seconds of the Task Presentation Phase preceding the Practice Phase in which the observation was to occur. The researcher also identified on the structural map the location of the interactive episode to be coded.

3) When the observer indicated she was ready, the videotape recorder was turned on and the observer read the transcript and/or watched/listened to the videotaped record of the episode. The
recorder was turned off when the terminating boundaries of the episode were reached. The observer reread the transcript and/or observed a replay of the videotaped record as often as was necessary to code the episode.

4) Steps 1-3 were repeated until all interactive episodes in the sample were coded. Once all observations were completed, interobserver agreement was computed on the coding of the interactive episodes according to the inductively derived categories of information using the formula identified earlier.

Additional Data Construction and Analysis:

A Product of the Interactive-Reactive Nature of the Research Process

Subsequent to the researcher's identification during data analysis of the seven categories of information, questions were raised by the investigator about the nature of the most frequently recurring category. This inductively derived category was "Rapid Fire-Task Driven Feedback", a form of feedback related to students' performance of motor skills (i.e., Section 3.2.4 in Chapter IV presents a full discussion of this category). Questions regarding this category led to additional data construction and analysis procedures by the researcher, as well as an additional process of validation of the findings.

The researcher obtained data for exploration of the "Rapid Fire-Task Driven Feedback" category by coding each of the 93 occurrences of feedback in the four lessons according to one a priori
and two inductively derived categories. These categories are identified below.

**Categories**

**Function of the Feedback**

Each occurrence of "Rapid Fire" feedback (n=93) was coded according to the manner in which the feedback functioned during the interactive episode. These functions were inductively derived. The findings indicated this category of information had two functions:

- Affirming function;
- Do it! function.

**Congruency of the Feedback with Stated Task**

Each occurrence of "Rapid Fire" feedback (n=93) was coded according to whether the source of congruency with the stated task was a reference to one or both of the topics identified below (i.e., congruency was also an inductively derived characteristic). These topics are explained fully in Chapter IV.

- Major Movement Task;
- Critical Performance Elements.

**Target of the Feedback**

Each occurrence of the "Rapid Fire" feedback (n=93) was coded according to whom the feedback was directed (i.e., the target of the feedback):

- Individual (I);
- Individual/Public (I/P);
- Group (G);
- Class (C).
Data were also obtained by coding each occurrence (n=49) of the "Rapid Fire" feedback that 1) had an affirming function (i.e., feedback that "told" a student he/she had demonstrated or performed well one or more of the critical performance elements) and 2) was directed to an individual, individual/public, or group, according to the two major priori determined categories identified below - accuracy and skill level.

Accuracy of the Feedback

Accuracy was determined by observing the videotaped record of motor skill performance of each person to whom the "Rapid Fire" feedback was directed. Depending upon whether or not the critical performance elements that were affirmed by the teacher were actually demonstrated in the motor skill performance of the student(s), the feedback was coded as one of the following:

- Accurate;
- Inaccurate.

The skill level assessment was determined by examining the record of student skill level rankings made by the school's regular physical education teachers prior to the start of the study (i.e., see the discussion on "Locus of Observation" earlier in this chapter for an explanation regarding the manner in which this list was obtained).

Four basic steps guided the process of coding the feedback in the 93 interactive episodes in which the category was observed and the 49 episodes in which the function of the Rapid Fire Feedback was "Affirming".
1) The researcher extracted the teacher stated expectations for practice of the major movement task by reading the transcript of the Task Presentation Phase on the structural map (i.e., Knowledge of stated expectations was essential for coding several of the descriptive categories).

2) Beginning with Lesson 1, the researcher located the first interactive episode in which the "Rapid Fire" feedback category had been observed on both the structural map and the videotaped record of lesson.

3) The researcher listened to and watched, as well as read from the structural map, the interaction between teacher and student(s) during the episode. The observation was repeated as often as was necessary for the researcher to code the feedback according to the appropriate descriptive categories (i.e., The only exception to this procedure was the "skill level" descriptive category. Data regarding the skill level of participants was obtained by examining the list of skill level rankings made by the school's regular physical education teachers prior to the start of the study).

4) Steps 1-3 were repeated for every occurrence in which the feedback was to be coded.

**Trustworthiness of the Data**

Post hoc validation of the researcher's coding of the "Rapid Fire-Task Driven Feedback" was conducted by External Observer A. The validation process consisted of the observer coding a systematically selected sample of occurrences of "Rapid Fire-Task Driven Feedback"
according to the designated descriptive categories. Interobserver agreement was computed using the formula identified below for event data for each of the five categories except for the skill level category (i.e., it was not necessary for the observer the code to skill level for the purpose of the validation process. The skill level ranking corresponded to the target of the feedback. If there was disagreement between researcher and observer on the target, there would likewise be disagreement on the skill level).

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

An agreement was recorded each time the observer and researcher agreed upon the descriptive code assigned to the feedback. Table 8 shows the number of agreements and disagreements, as well as the corresponding interobserver agreement measures, for each category overall. Table 9 shows the distribution of agreements and disagreements within each category.

**Procedures for Determining Trustworthiness**

A 60 minute training session was held to train the observer for the interobserver agreement session. Observer training was a two part process. In Part 1 the researcher briefly identified each of the five descriptive categories. Part 2 involved a series of steps that examined each descriptive category on a category-by-category basis. In Step 1, a category was selected and verbally explained to the observer. Step 2 involved the researcher showing the observer a
Table 8

Level of Interobserver Agreement on Coding of "Rapid-Fire Feedbacks"

<table>
<thead>
<tr>
<th>Descriptive Category</th>
<th>No. of Agreements</th>
<th>No. of Disagreements</th>
<th>Interobserver Agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function of Feedback</td>
<td>28</td>
<td>5</td>
<td>85%</td>
</tr>
<tr>
<td>Congruency of Feedback</td>
<td>28</td>
<td>5</td>
<td>85%</td>
</tr>
<tr>
<td>Target of Feedback</td>
<td>26</td>
<td>7</td>
<td>79%</td>
</tr>
<tr>
<td>Accuracy of Affirming Feedback</td>
<td>14</td>
<td>4</td>
<td>75%</td>
</tr>
<tr>
<td>Skill Level of Students Receiving*</td>
<td>35</td>
<td>42</td>
<td>83%</td>
</tr>
</tbody>
</table>

*Interobserver Agreement =

\[
\frac{\text{Number of Agreements}}{\text{Number of Agreements} + \text{Number of Disagreements}}
\]
Table 9

Level of Agreement on Coding Within Each Descriptive Category

<table>
<thead>
<tr>
<th>FUNCTION</th>
<th>CONGRUENCY*</th>
<th>TARGET*</th>
<th>ACCURACY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Major</td>
<td>Critical</td>
<td>I IP G C</td>
</tr>
<tr>
<td></td>
<td>Movement</td>
<td>Performance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Task</td>
<td>Element</td>
<td></td>
</tr>
<tr>
<td>Affirming</td>
<td>Do It</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>15</td>
<td>4</td>
<td>27</td>
</tr>
<tr>
<td>Disagree</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Interobserver Agreement</td>
<td>83%</td>
<td>80%</td>
<td>100%</td>
</tr>
</tbody>
</table>
series interactive episodes in which "Rapid Fire Feedbacks" were present. Prior to conducting the observation, the observer read the transcript of the Task Presentation Phase in order to extract the stated major task expectations. Subsequent to observing each instance of the Feedback, the researcher and observer engaged in a discussion that focused on why the episode was coded as containing this category. In Step 3, the observer practiced coding a series of interactive episodes (i.e., The researcher located on the structural map for the observer the Task Presentation Phase, as well as the interactive episode, in which the observation was to be conducted in each instance for the observer. The researcher also located the interactive episode on the videotape recorder and operated the recorder for the observer). After each instance of the Feedback was coded, the researcher and observer again engaged in discussion. In Part 3, the final part of the observer training, the observer practice coded each of a series of "Rapid Fire Feedbacks" according to all of the categories, rather than just one as in the previous Part.

Protocol for Coding Session

The same general procedures that was used to train the observer were also used in the actual coding session in which interobserver agreement was determined. A systematically selected sample of "Rapid Fire Feedbacks" (n=33) was selected for coding by the observer: In the first Phase Unit in the General Activity Part of the Lesson for Lessons 1, 8, and 12, all occurrences of "Rapid Fire Feedbacks" that
had an "Affirming" function (n=18) and every other occurrence of the "Rapid Fire Feedback" that had a "Do it" function (n=15) were coded. As explained previously, the researcher "found" on the videotape the interactive episode, Task Presentation Phase, and so on for the observer. When the observer indicated she was ready, the researcher turned the videotape recorder on approximately 30 seconds prior to the beginning of the interactive episode in which the observation was to be conducted. The machine was turned off when the terminating boundaries of the episode were reached. The episode was replayed as often as was necessary for the observer to make a coding decision for each of the designated descriptive categories. When all occurrences of the "Rapid Fire Feedback" in the sample selected for the validation procedure had been coded, interobserver agreement was computed on each of the categories using the formula identified earlier.

Research Question 3.2.5: Procedures for Obtaining Data

Data for exploration of patterns of motor skill responses for three high skilled and three low skilled Target Students were obtained via a two-part analytic process (i.e., A skill response was defined as an attempt by the Target Student to play the ball that resulted in the ball being touched by the Target Student). The two parts were microanalysis and macroanalysis of each Target Student's skill responses for the overhead pass and forearm pass. Both parts involved the observation of the videotaped record of Target Students' skill responses on a response-by-response basis.
Microanalysis

Part 1, microanalysis was conducted in Lessons 1, 2, 8, and 12 and in Lesson 14, the last lesson in the instructional unit. This part involved using four categories to code each of the six Target Students skill responses for the designated two motor skills during alternating Movement Task Units, plus the last Unit in the five lessons. These categories were:

- Non-Codeable (NC);
- Successful (S);
- Unsuccessful (U);

Findings are presented in Chapter IV for only one of these categories - the Successful Category. All of the categories are defined here, however, in order to make explicit the full coding process that was used. The primary criteria for coding a skill response according to each of these four categories are discussed below.

Response Not Codeable Category

The first decision that was made involved determining whether or not the response was a codeable response, that is, whether or not the response could be categorized as L-OIRS, S, or U.

Successful Category

There were two sets of criteria for coding a skill response as successful. The factor that determined which set of criteria was used was the type of major movement task that was stated by the teacher during the Task Presentation phase of the Movement Task Unit in which the observation of skill responses was to occur. There were
three primary types of major movement tasks designated by the teacher during Task Presentation -

1) cooperative major movement tasks
2) competitive major movement tasks
3) cooperative or competitive major movement tasks

A cooperative major movement task was a task in which the students in the playing unit worked together to keep the ball going back and forth over the net. A cooperative task was the opposite of the second kind of task - the competitive task. A competitive task was one in which one playing unit tried to defeat the other by obtaining a better score in the defined contest. A cooperative or competitive major movement task meant that during the Task Presentation Phase the teacher had given students a choice of either a cooperative task or a competitive task.

The criteria for coding the success of a skill response when the designated major task was a cooperative task or a choice of cooperative/competitive tasks were the same. The "cooperative criteria" were used to assess the choice task because those criteria were more stringent than the criteria for competitive tasks in terms of the quality of the outcome of the passing action. The second set of criteria was used to code the success of a skill response when the designated task was competitive.

Criteria for coding a skill response as successful for a cooperative/"choice" task. When the stated major movement task was a cooperative or "choice" task, the Target Student's skill response for the overhead pass or forearm pass was considered successful under the following conditions:
1) When the next player on either side of the net to touch the ball passed by the Target Student allowed play to be continuous. That is, a Target Student's skill response was coded as successful if the next player to pass the ball did not terminate play with his/her response but allowed a third player to contact the ball.

2) When the next player on either side of the net to touch the ball passed by the Target Student made a response that terminated play (i.e., did not allow another third player to contact the ball), but the Target Student passed ball was passed well enough that a successful response should have been made; OR

If the ball passed by the Target Student was not touched by another player, but the Target Student passed ball was passed well enough that a successful response should have been made. Passed "well enough" included meeting one of the following criteria:

- The ball passed by the Target Student traveled to a height at least as high as three feet above the top of the net.

- The ball passed by the Target Student traveled within a short two step reach of a player on either side of the net, unless the Target Student's pass was the third hit for the Target Student's playing unit.

- The ball passed by the Target Student should easily have been played by another player on either side of the net. The "should easily have been played" decision was made subsequent to the "net height" and "two step" decisions. This playability criterion allowed coder flexibility on those balls passed by the Target Student that met the "net height" and "two step" criteria yet were not balls that
were easily playable due to the other factors or variables (i.e., playing conditions) that influenced ball playability.

Criteria for coding a skill response as successful for a competitive task. When the stated major task was a competitive task, the target students' skill response for the overhead pass or forearm pass was considered successful under the following conditions:

1) When the ball passed by the Target Student was touched next by a player on either side of the net; OR

2) When the ball passed by the Target Student was not, but should have been played by another student on either side of the net. "Should have been played" meant that the ball was a playable ball - based upon consideration of such variables influencing ball playability as the "two step" characteristic, the "net height" characteristic, and so on; OR

3) When the ball passed by the Target Student landed inbounds on the other side of the net without being touched by another player. There were no actual boundary lines marked on the gym floor for playing units. Because the boundary lines were imaginary, the "inbounds" decision was based upon the two coders' assessment as to where the students had marked the boundary lines. This decision was informed by examination of students' actions during play.

Unsuccessful Category

There were two sets of criteria for coding a skill response as unsuccessful. Comparable to the criteria for coding a skill response as successful, the criteria that were used to code a response as
unsuccessful were based upon the type of major movement task that was stated by the teacher for cooperative/"choice" tasks and a second set of criteria for competitive tasks.

Criteria for coding a skill response as unsuccessful for a cooperative/choice task. When the major movement task was a cooperative or "choice" task, the target student's skill response for the overhead pass or forearm pass was considered unsuccessful under the following conditions:

When the oncoming ball to the Target Student (i.e., The ball that was to be passed by the Target Student) was considered playable and the Target Student made a skill response which resulted either in a) the next player that touched the ball on either side of the net terminating play with his/her response or b) the ball not being touched by another player under any one of the following conditions:

- The ball passed by the Target Student failed to travel to a height at least as high as three feet above the top of the net
- The ball passed by the Target Student did not travel within a two step reach of a player on either side of the net.
- The ball passed by the Target Student was the third hit of the side for the Target Student's team.

Criteria for coding a skill response as unsuccessful for a competitive task. When the major movement task was a competitive task, the Target Student's skill response for the overhead or forearm pass was considered unsuccessful under the following conditions:
1) When the ball passed by the Target Student landed out-of-bounds (i.e., Again, the coders made a judgment on the boundary lines based upon observation of the students' actions during play).

2) When the ball passed by the Target Student did not go over the net on the third hit of the side.

3) When the ball passed by the Target Student went out of bounds on her/his side of the net without being played successfully by another teammate. "Played successfully" meant that this player (i.e., the teammate) had to either 1) pass the ball over the net or 2) pass the ball or his/her side so that a third player could touch the ball.

**Lack of Opportunity to Respond Successfully Category**

The Target Student's skill response for the overhead pass and forearm pass was coded as lack of opportunity to respond whenever the oncoming ball (i.e., the ball that was coming toward the Target Student and was to be passed by the Target Student) was considered by the coders to be very difficult to play successfully and the Target Students' resulting response was, in fact, an unsuccessful one (i.e., based upon the appropriate set of criteria for coding a response as unsuccessful). Playing conditions that resulted in the oncoming ball being judged as very difficult to play included but were not limited to:

- The oncoming ball could not be reached by the Target Student within an easy two step reach;
- The oncoming ball to be passed by the Target Student failed to reach a height of at least two feet above the top of the net;
- The oncoming ball traveled at a trajectory that made the ball difficult to play.

The discussion that preceded focused on the four categories used to code each of the six Target Student's skill responses during the first part of the two part analytic process. While Part 1 of the analytic process involved microanalysis of the motor skill responses, Part 2 consisted of a macroanalytic approach to the analysis of skill responses.

**Macroanalysis**

Part 2 consisted of macroanalysis of Target Student's motor skill responses for the overhead pass and forearm pass during five systematically selected lessons not microanalyzed (i.e., Lessons 3, 5, 7, 9, and 11). In this part an overall frequency was obtained for each Target Student's skill responses for the overhead and forearm pass during alternating Movement Task Units plus the last one in each sampled lesson. This frequency of response measurement was obtained for alternating groups of three of the six Target Students (i.e., two high and one low skilled student and two low and one high skilled student) for Lessons 3, 5, 7, 9, and 11.

**The Nature of the Coding Process-An Overview**

The process of coding Target Students' motor skill responses was different from any of the preceding coding procedures in this study. While the procedures heretofore involved the researcher conducting
the coding and an external observer validating the findings on a post hoc basis, the process used in the analysis of skill responses consisted of the researcher and an external observer simultaneously coding skill responses. The process involved coding a student's skill responses on a response-by-response basis according to the four designated categories described earlier. First, after observing a skill response, each coder independently recorded the response via one of the four categories. Second, the categories were compared. If agreement was reached, the next skill response was observed and coded. If agreement was not reached, the coders attempted to resolve the disagreement by observing replays of the videotaped response and discussing it. The disagreement was either resolved or not resolved and the coding decision was likewise recorded.

The coding process first described was used as a result of both the dynamics and the complexity of the volleyball playing action between and among participants, and the fact that this method of coding was an exploratory effort in physical education research (See Earls (1983) for an exception). The researcher felt it would be difficult to specify on an a priori basis all the conditions that would impact upon the coding of each individual skill response. Thus, it would be difficult to obtain a high level of interobserver agreement on the basis of the criteria outlined previously for the four categories. Thus, it was determined that a more valid and reliable method of assessment of skill responses was first, for each coder to make a decision independently on the appropriate category of a skill response, and second, in cases of disagreement, for the
coders to attempt to resolve the disagreement. A record of all
decisions was kept.

The Product of the Two Part Analytic Process

The product of the two part, micro and macro process of analysis
was a record of 1) the frequency of skill responses for each Target
Student in the ten microanalyzed and macroanalyzed lessons, and 2)
the frequency of successful motor skill responses for each Target
Student in the five lessons (i.e., It was stated earlier that
findings from microanalysis are presented only for the "Successful
Category"). The frequency was based on the sum of 1) the number of
agreements where both coders rated the response as successful and 2)
the number of agreements where the coders had originally disagreed on
the ranking (i.e., one coded the response as successful and the other
coded the response as one of the other three categories but had
resolved the disagreement to an agreement on success). The data
described above were summarized into a Response Rate Per Minute
(RR-PM) during the time allocated for practice (i.e., the Student
Practice Phase) for each Target Student in the macroanalyzed lessons
and a Successful Response Rate Per Minute (SRR-PM) during the time
allocated for practice for each Target Student in the microanalyzed
lessons. Response rates were obtained according to the steps below:

1) For each Lesson, the total amount of the time allocated for
practice was determined. This figure was arrived at by summing the
length of each Student Practice/Teacher Interaction Phase during the
lesson (i.e., These times were taken from the organizational map).
2) The total practice time in seconds was divided by 60 to obtain minutes.

3) The frequencies of total responses and successful responses were each divided by the number of minutes allocated for practice per lesson to obtain the response rate-successful response rate per minute during practice.

Observer Training

Three 45 minute training sessions were held to train the observer to code skill responses for both the overhead pass and forearm pass according to the four designated categories. Observer training consisted of a two part process. Part 1 consisted of a basic explanation of the four categories. The explanation included a discussion of the cooperative/competitive/choice tasks upon which the criteria for two of the categories were based (i.e., successful and unsuccessful categories).

Part 2 consisted of an in-depth, multi-step training process on a category-by-category basis. The first category selected for explanation was the Successful Category. The initial step in Part 2 consisted of the researcher explaining this category, this time in more detail than the original explanation in Part 1. This explanation focused on the criteria upon which the assessment of a skill response was based. In the process of providing a verbal explanation of the category and the criteria for assessment, the researcher, in some instances, visually demonstrated the action that
would result in the skill response being coded according to the successful category.

In the next step the researcher used the raw videotaped record to show the observer examples of overhead and forearm pass skill responses that were successful (i.e., The researcher operated the videotape recorder for all training sessions, as well as the coding sessions). The researcher and observer engaged in discussion regarding why these responses were successful. The skill responses observed throughout the training session were not selected from Movement Task Units in which the actual researcher/observer coding of responses was to occur.

The unit of analysis during the observation of these examples of successful responses was the "skill response episode". The beginning boundary of the skill response episode was the point at which the oncoming ball left the body (i.e., hands or arms) of the person who touched the ball immediately prior to the Target Student. The terminating boundary of the skill response episode occurred when the ball passed by the Target Student either hit the floor or was passed by another player on either side of the net. The skill response episode was designated as the unit of analysis because it permitted the criteria designated earlier to be applied to the analysis of responses. Each time a skill response was observed the observation was the same: Like data sets had been created via creation of the skill response episode.

In Step 3 the observer was given a series of skill responses to code as either "Successful" or "Something Other Than Successful".
Subsequent to each skill response episode, the researcher and observer engaged in discussion regarding the descriptor selected and attempted to clarify reasons for disagreement if such occurred.

Once the observer reached a 70% level of agreement on the coding of the skill response, Steps 1-3 were repeated with the three remaining categories - Unsuccessful, Lack of Opportunity to Respond Successfully, and Non-Codeable. Interobserver agreement measures were not computed on these categories.

Part 3, the final part of observer training, involved the observer coding a series of motor skill responses according to any one of the four categories, rather than limiting the observational focus to just one of the categories as had been done in Part 2. When the observer and researcher reached a 70% level of agreement overall for coding skill responses (i.e., not on a category by category basis), observer training concluded.

Coding Procedures

During the coding session, the researcher and external observer simultaneously, but independently, observed and coded each skill response made by a Target Student during the systematically selected sample of Lessons and Movement Task Units. The basic procedures for coding the skill responses are discussed below.

The researcher informed the observer as to which set of criteria would be used to code the successful/unsuccessful category (i.e., Depending on whether the major movement task was a cooperative task, a competitive task, or a choice of cooperative/competitive tasks, a
different set of criteria was applied to the analysis of the skill responses). The following steps guided the coding process:

1) The researcher operated the videotape recorder. The videotape recorder was turned on approximately one minute prior to the start of the Practice Phase in which the observation was to occur. During this time the researcher located the target student on the videotape and identified him/her for the observer.

2) The researcher and observer simultaneously observed the skill response episode at regular speed (i.e., the speed at which the skill response episode occurred in situ). The videotape was turned off at the terminating boundaries of the skill response episode and rewound to a point immediately preceding the beginning boundaries of the episode (i.e., the point at which the oncoming ball left the hands/arms of the student passing the ball prior to the Target Student).

3) The videotape recorder was turned on and the skill response episode was observed in slow motion by the researcher and observer. The tape was turned off at the terminating boundaries of the skill response episode (i.e., Additional viewings of the videotaped record of the skill response episode occurred if either the researcher or the observer indicated a need for additional observation).

4) The researcher and observer independently coded on the recording sheet the skill response according to one of the four categories.
5) Once each of the two coders had recorded the category, the observer informed the researcher which category she had assigned to the skill response.

6) Depending upon whether or not the researcher and observer had coded the skill response the same, the researcher then recorded a "coders agree" or "coders disagree" on the Master Coding Sheet. If the coders disagreed, they observed the skill response one or more times and attempted to resolve the disagreement. Depending upon whether or not the disagreement was resolved, the researcher recorded a "disagreement resolved" or "disagreement not resolved" and the appropriate category(s) on the Master Coding Sheet.

7) Steps 2-7 were repeated for each successive skill response until all skill responses for the Target Student had been coded during the Movement Task Unit. Once all of the skill responses had been coded for a single student, one of the five remaining Target Students was selected and Steps 2-7 continued.

8) When the responses for all of the Target Students for a Movement Task Unit had been recorded, the researcher "found" the next Movement Task Unit in the systematically selected sample on the videotape. Once again, the researcher designated the appropriate criteria for coding the skill response as successful or unsuccessful. Steps 2-7 were then repeated.

9) When observation of all of the Target Students' motor skill responses was completed for the systematically selected sample of Movement Task Units in the four lessons analyzed, interobserver
agreement was calculated according to the formula identified in the discussion below.

**Trustworthiness of the Data**

Interobserver agreement was calculated on 1) the overall frequency of skill responses for each Target Student across the ten lessons microanalyzed and macroanalyzed and 2) the overall frequency of successful responses for each Target Student across the five lessons microanalyzed. With regard to the total frequency of responses, the scored event method for determining interobserver agreement was used according to the formula below:

\[
\frac{\text{Number of Agreements}}{\text{Number of Agreements} + \text{Number of Disagreements}} \times 100
\]

An agreement was recorded each time the observer and researcher independently agreed that the Target Student had emitted a skill response. A disagreement was recorded when one, but not both, of the observers recorded the occurrence of a skill response. Table 10 shows interobserver agreement on the coding of frequency of skill responses for each target student.

With regard to the frequency of successful responses, three levels of analysis were conducted for each Target Student. First, interobserver agreement was calculated using the scored event method identified above: Each time the coders independently agreed that a successful response had occurred, an agreement was recorded. A disagreement was recorded when one, but not both, of the observers recorded the response as successful (All skill responses for which
Table 10

**Interobserver Agreement on the Frequency of Skill Responses as Coded Independently by Two Observers**

<table>
<thead>
<tr>
<th></th>
<th>High Skilled Students</th>
<th>Low Skilled Students</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Brenda</td>
<td>Jody</td>
</tr>
<tr>
<td>Interobserver Agreement</td>
<td>95</td>
<td>97</td>
</tr>
</tbody>
</table>
both coders recorded the absence of a successful response were ignored). Thus, the formula was applied as follows:

\[
\frac{\text{Agreements (S-S)*}}{\text{Agreements (S-S) + Disagreements (S-one of the three other categories)}} \times 100
\]

For example, Brenda, a Target Student, was independently coded as successful by either or both observers for a total of 280 responses. Of these 280 responses, both coders coded the response as successful 192 times while the response was coded as successful by only one of the coders 88 times. Thus, the formula was applied:

\[
\frac{192}{192 + 88} \times 100 = 69\%
\]

The second level of analysis was the analysis of attempts to resolve disagreements. For each Target Student, an analysis was conducted of the frequency/percentage of disagreements which 1) were resolved by the coders in favor of success (i.e., Both coders agreed the response was successful), 2) were resolved by the coders in favor of one of the three remaining categories (i.e., unsuccessful, lack of opportunity to respond successfully, noncodable), and 3) were not resolved by coders.

In the example of Brenda, the analysis of the 88 disagreements was as follows:

*S-S = both coders coded with response as successful."
49 (56%) disagreements resolved in favor of success;
28 (32%) disagreements resolved in favor of a category other than successful;
11 (13%) disagreements not resolved.

The third and final level or kind of analysis for each Target Student was determining a resolved interobserver agreement. That is, interobserver agreement was calculated on the data which had been adjusted via the analysis in the second level. Again, the scored event method was used to obtain interobserver agreement on these adjusted data. The data were adjusted by 1) adding to the original number of agreements (i.e., the agreements in which both coders independently coded the response as successful) the number of resolved disagreements in favor of success and 2) subtracting from the disagreements both the number of disagreements resolved in favor of success and the disagreements resolved in favor of something other than successful (i.e., These responses were no longer scored events). To complete the example of Brenda, the adjusted data for the resolved interobserver agreement was as follows:

\[
\frac{912 + 49}{(192 + 49) + 88 - (49 + 28)} \times 100 = 96\%
\]

Table 11 shows the levels of interobserver agreement on the independent coding of successful responses, as well as the resolved interobserver agreement, the measure of agreement in the third level of analysis. Table 12 shows for each Target student the analysis of disagreements resolved and not resolved.
Table 11

**Measures of Interobserver Agreement on Coding Successful Skill Responses of Target Students**

<table>
<thead>
<tr>
<th>Interobserver Agreement</th>
<th>High Skilled Target Student</th>
<th>Low Skilled Target Student</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Brenda</td>
<td>Jody</td>
</tr>
<tr>
<td>Independently Coded*</td>
<td>65%</td>
<td>64%</td>
</tr>
<tr>
<td>Resolved**</td>
<td>96%</td>
<td>92%</td>
</tr>
</tbody>
</table>

*Interobserver Agreement on skill responses independently coded as successful.

**Interobserver Agreement on skill responses resolved as successful.
Table 12

Analysis of Resolution of Disagreements/Non-Resolution of Disagreements

<table>
<thead>
<tr>
<th></th>
<th>Agreements Resolved in Favor of Success</th>
<th>Disagreements Resolved in Favor of Something Other than Success</th>
<th>Disagreements Not Resolved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brenda</td>
<td>76</td>
<td>32</td>
<td>13</td>
</tr>
<tr>
<td>Jody</td>
<td>58</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>Dustin</td>
<td>33</td>
<td>19</td>
<td>47</td>
</tr>
<tr>
<td>Tina</td>
<td>48</td>
<td>15</td>
<td>36</td>
</tr>
<tr>
<td>Fred</td>
<td>29</td>
<td>50</td>
<td>21</td>
</tr>
<tr>
<td>Craig</td>
<td>64</td>
<td>11</td>
<td>25</td>
</tr>
</tbody>
</table>

Range in Resolving Disagreements in Favor of Agreement of Success = 33% - 64%
Mean in Resolving Disagreement in Favor of Agreement of Success = 48%
SUMMARY

This Chapter presented the design of the research, the locus of observation, the procedures for the collection of raw data, the general analytic process, the specific procedures of analysis, and the procedures for establishing trustworthiness of the data. As has been shown, this study involved the identification of a variety of kinds and sources of data that were interactive-reactive in nature. Finally, discussions on trustworthiness showed that the product of the analysis was the identification of a highly reliable set of findings.
The general purpose of the study was to respond to the need for a better understanding of teaching and learning processes in physical education. To accomplish this goal, it was necessary to reconsider the nature of life in the gymnasium. The preceding chapters outlined the rationale for and the nature of the conceptualization of daily life in physical education as a communicative process. These chapters presented the theoretical constructs upon which that conceptualization was based (Chapter I and II) and a methodology for capturing and analyzing daily events in the physical education class (Chapter III).

Both the general purpose of the study and the resulting conceptualization of the physical education class as an active communicative environment led to the primary goal of the study:

The identification of factors that support and constrain students' academic performance (i.e., motor skill performance) within and across the 14 lessons of an instructional unit on volleyball.

This goal was arrived at by exploring the social and academic nature of daily life in the physical education class.
Three major research questions guided the process of observation and analysis of data:

1. What is the nature of the organizational structure of lessons in the volleyball unit?
2. What is the nature of the social structure of lessons in the volleyball unit, in which the academic work of lessons is simultaneously embedded?
3. What is the nature of the academic structure of the Movement Task Unit in the volleyball unit?

One way to view these questions was to see them as a nested set of circles with Question 3 embedded in and related to Questions 1 and 2 (See Figure 5). Viewed in this way, Question 3 becomes the foregrounded or primary question and the other questions provide information about the factors that support and/or constrain the academic performance. The complexity of daily life in the gym required that each of the three major research questions be further subdivided to reflect different aspects of the teaching/learning process. While some subquestions were derived from past work on instruction, others emerged from the data. The specific relationship of the subquestion to the major question, as well as the interrelationships between and among the various subquestions, are discussed in separate sections.

1.0 What is the nature of the organizational structure of lessons in the volleyball unit?
Figure 5. The three part structure of lessons.
1.1 How is the organizational structure of lesson on one day both similar to and different from the organizational structure on other days?

1.2 How is time distributed within the organizational structure of the physical education class?

1.3 What are the major movement tasks around which the academic work of lessons is organized?

2.0 What is the nature of the social structure of lessons in the volleyball unit, in which the academic work of these lessons is simultaneously embedded?

2.1 What are the normative requirements for acting or conducting oneself as a student in the physical education class?

3.0 What is the nature of the academic structure of the Movement Task Unit during lessons in the volleyball unit?

3.1 What is the nature of the information communicated to students during the Task Presentation Phase of the Movement Task Unit?

3.2 What is the nature of students' participation in physical activity and information communicated by the teacher during the Practice Phase of the Movement Task Unit?

Given the complexity of life in the gym and the fact that Research Question 3.0 is the foregounded question of interest in this study, subquestion 3.2 was also divided into a series of questions.
3.2.1 What is the nature of students' engagement in the stated movement task during the Practice Phase of the Movement Task Unit?

3.2.2 What is the nature of students' efforts to modify the stated movement task?

3.2.3 What is the nature of the teacher's response to students' efforts to modify the stated movement task?

3.2.4 What is the nature of students' motor skill performance during the Practice Phase of the Movement Task Unit?

3.2.5 What is the nature of the information communicated by the teacher during the Practice Phase of the Movement Task Unit?

STRATEGY FOR PRESENTATION OF FINDINGS

The research process used here permitted the extraction of a variety of different kinds of data from a variety of different sources to answer the major Research Questions and their constituent subquestions. Generally, multiple kinds and sources of information were brought to bear on phenomena of interest in the physical education class to provide an understanding of the complexity of the teaching/learning process. A discussion of the reliability of the data was provided on a Research Question-by-Research-Question basis in Chapter III. Additionally, findings are presented in both quantitative and qualitative format. The quantitative information is presented using descriptive statistics and qualitative findings
are presented in narrative form. Minimal discussion is incorporated with the presentation of the findings to contextualize and to clarify findings (An elaborated and integrated discussion of findings is presented in Chapter V.).
The question in this section examines the nature of the organizational structure of the fourteen lessons during the instructional unit on volleyball. The general question guiding the analysis in this section is:

1.0 What is the organizational structure of lessons in the volleyball unit?

This major question was divided into three subquestions:

1.1 How is the organizational structure of lesson on one day both similar to and different from the organizational structure on other days?

The preceding question consisted of two parts.

1.1.1 What is stable about the organizational structure of lessons?

1.1.2 What is variable about the organizational structure of lessons?

1.2 How is time distributed within the organizational structure of lesson within the physical education class?

1.3 What are the major movement tasks around which the academic work of lessons is organized?

The questions are interrelated. Questions 1.1 and 1.2 were part of the initial set of questions identified at the onset of the study while Question 1.3 was a product of interactions with the data.

Question 1.1 was derived from recent research on classroom processes conducted from a social interaction perspective. This research suggests that the manner in which lesson is organized can influence the nature of students' academic performance (e.g., Green & Harker, 1982; Erickson, 1982; Green & Weade, 1985; Mehan, Cazden, Coles, Fisher, Maroules, 1976). Research Question 1.2 is also grounded in
past research on instruction. One specific program of research that focused on the manner in which time was spent in classrooms and gymnasium was Academic Learning Time research. This research shows that the manner in which students spend their time in lessons can also be related to the manner in which students perform academically (Denham & Lieberman, 1980). While the first two research questions are rooted in the knowledge base generated by research on teaching, Research Question 1.3 was derived from interactions with the data. Specifically, findings from Question 1.2 regarding the manner in which time was spent led to Question 1.3: What are the major movement tasks around which the academic work of lesson is organized?

Data for exploration of patterns of organizational stability (Question 1.1.1) and variability (Question 1.1.2) for the fourteen lessons were obtained via the multi-step process of microanalysis and macroanalysis of the instructional conversation (A detailed description of the specific steps used in this two-part analytic process was presented in Chapter III and the Appendix.). Microanalysis of the instructional conversation was conducted for Lessons 1, 2, 8 and 12 and resulted in the construction and analysis of organizational maps of the unfolding conversation (See Figure 4 in the preceding chapter). Macroanalysis of the instructional conversation was conducted in all lessons not microanalyzed. The steps for macroanalysis were very similar to those for microanalysis (See Chapter III). The difference between the two analytic
procedures lay primarily in the level of hierarchical units that were used to construct the map than in the nature of the information obtained.

The product of both microanalysis and macroanalysis, then, was a structural map of the organizational structure of each of the fourteen lessons in the volleyball unit. Once the maps were obtained, the search for recurring patterns of organization within and across days was undertaken. This search led to the identification of patterns of stability and change in the physical education class.

**Question 1.1.1:**
**Patterns of Organizational Stability**

A search of the structural maps for recurrent patterns of organizational structure within and across days led to the identification of one completely stable, macro organizational pattern for the fourteen lessons in the volleyball unit. This macro pattern was the pattern of lesson organization for each of the fourteen lessons in the volleyball unit. The macro organization for lessons consisted of a three-part organizational structure to lesson. Figure 6 in the illustrates this structure. As indicated, each lesson contains:

- a) Pre-Physical Activity Part
- b) General Physical Activity Part
- c) Post-Physical Activity Part

Within each of these major parts, there were also stable subpatterns in lesson organizational structure that occurred in each of the
Figure 6. Organizational structure of lessons.
fourteen lessons. These subpatterns, like the macro pattern, were extracted in each lesson. Findings regarding each macro part, and its subpatterns, are presented separately.

Pre-Physical Activity Part to Lesson

The Pre-Physical Activity Part to Lesson always consisted of one or more lesson phases (See Figure 6). One phase that was stable across all lessons during this first part of lesson was the "Student Entry into Gym" phase.

The Entry Phase, the first phase in each of the fourteen lessons in the volleyball unit, consisted of the students entering the gym from the girls' and boys' lockerrooms and subsequently "settling down" and becoming attentive to the teacher. This recurrent phase of lesson functioned consistently in the same manner throughout the volleyball unit. More specifically, an examination of the maps of the instructional conversation for the four lessons microanalyzed (i.e., Lessons 1, 2, 8, and 12) revealed that the Entry Phase was used by the teacher as a period of structuring or setting up for lesson. This structuring function of the Entry Phase included both physical structuring (e.g., "Get a partner;" "Find a volleyball and sit beside it without touching it"; "Sit in the center circle") as well as signaling expectations about other forms of appropriate student conduct during the lesson (e.g., "Get quiet"; "Listen carefully"; "Stop talking"). Thus, the Entry Phase was used by the teacher each day to set up for the academic work of lesson (i.e., performance of the major movement task).
Stability in the manner in which lessons began facilitated a shared frame of reference between teacher and students regarding getting started with the academic work of lesson. That is, the videotaped record revealed that upon entering the gym from the lockerroom, students generally organized themselves quickly into playing units, found a playing space, sat down, and appeared to focus their attention on their teacher (i.e., students were quiet and looked generally in the direction of the teacher).

The findings above indicate that one, there was stability in the way lesson was started each day and two, the "setting up" characteristic of the start to lesson permitted "getting on" to the academic work of lesson. From an organizational perspective, then, the manner in which class began each day facilitated practice of the academic movement task. This structuring characteristic of the Entry Phase was one factor supportive of students' improved motor skill performance. Additional findings are presented, however, that suggest caution in arriving at the preceding conclusion prematurely. These findings indicate that limiting one's observational focus to the manner in which the beginning of class looks from an organizational perspective can mask identification of potentially significant factors that support and/or constrain the academic motoric performance.

Structuring Student Groups

Questions regarding the influence of the teacher's recurring structuring actions on students' motor skill practice were raised as
students formed their playing groups during the Entry Phase. Repeated observation of students across time as they grouped themselves (and subsequently participated in physical activity) suggested that students almost entirely formed their groups according to sex. That is, girls played with girls and boys played with boys. In addition, the playing units or groups appeared to be consistently composed of the same participants that were generally of the same motor skill level in volleyball (i.e., high, medium, low). After this recurring pattern of grouping was identified, post hoc analysis was conducted to validate the pattern.

Analysis was conducted of the skill level and sex of the partner(s) of six randomly selected students during a systematically selected sample of lessons (n=3; 1 high, medium, low males; n=3; 1 high, medium, low females). The results of this analysis are presented in Table 13 and Table 14. The data in Table 13 indicate that the six target students almost exclusively played with students of the same sex (i.e., The range in the percentage of sampled Movement Task Units in which the sex of each playing partner of the six target students was the same as that of the target student was 93%-98%).

The data in Table 14 indicate that grouping by skill level was also a recurring pattern in the physical education class. The range in the percentage of sampled Movement Task Units in which the skill level of each playing partner of the six target students was the same as that of the target student was 68%-88%. While the data support the hypothesis that grouping by skill level was a recurring pattern
Table 13

**Number and Percentage of Movement Task Units in Which the Sex of Each Playing Partner of Six Students Was the Same as the Target Student**

<table>
<thead>
<tr>
<th>Lesson No.</th>
<th>MT5 High</th>
<th>MT5 Medium</th>
<th>MT5 Low</th>
<th>FT5 High</th>
<th>FT5 Medium</th>
<th>FT5 Low</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. MTUS in Which Sex was the Same</td>
<td>No. MTUS in Which Sex was the Same</td>
<td>No. MTUS in Which Sex was the Same</td>
<td>No. MTUS in Which Sex was the Same</td>
<td>No. MTUS in Which Sex was the Same</td>
<td>No. MTUS in Which Sex was the Same</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>5</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
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<td>6</td>
<td>5</td>
<td>6</td>
<td>5</td>
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<td>5</td>
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</tr>
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<td>9</td>
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<tr>
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<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>A</td>
<td>41</td>
<td>39</td>
<td>38</td>
<td>40</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>B</td>
<td>95</td>
<td>93</td>
<td>95</td>
<td>98</td>
<td>98</td>
<td>98</td>
</tr>
</tbody>
</table>

* A = Number of MTUs in which Sex of Playing Partner(s) Equaled Sex of Target Student.
** B = Percent MTUs in which Sex of Playing Partner(s) Equaled Sex of Target Student.

MT5 High = Male Target Student - High Skilled
MT5 Medium = Male Target Student - Medium Skilled
MT5 Low = Male Target Student - Low Skilled
FT5 High = Female Target Student - High Skilled
FT5 Medium = Female Target Student - Medium Skilled
FT5 Low = Female Target Student - Low Skilled

---

*204*
Table 14

Frequency and Percentage of Movement Task Units in Which the Skill Level of Each Playing Partner of Six Students Was the Same as the Target Student

<table>
<thead>
<tr>
<th>Lesson</th>
<th>MTS High</th>
<th>MTS Medium</th>
<th>MTS Low</th>
<th>FTS High</th>
<th>FTS Medium</th>
<th>FTS Low</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. MTUS in</td>
<td>No. MTUS in</td>
<td>No. MTUS in</td>
<td>No. MTUS in</td>
<td>No. MTUS in</td>
<td>No. MTUS in</td>
</tr>
<tr>
<td>No. MTUS</td>
<td>Which Skill Level</td>
<td>Which Skill Level</td>
<td>Which Skill Level</td>
<td>Which Skill Level</td>
<td>Sex was the Same</td>
<td>Sex was the Same</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
<td>6</td>
<td>3</td>
<td>6</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>8</td>
<td>8</td>
<td>7</td>
<td>8</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>6</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>6</td>
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<td>13</td>
<td>7</td>
<td>7</td>
<td>4</td>
<td>3</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>A*</td>
<td>41</td>
<td>36</td>
<td>29</td>
<td>30</td>
<td>33</td>
<td>28</td>
</tr>
<tr>
<td>B**</td>
<td>88</td>
<td>71</td>
<td>73</td>
<td>80</td>
<td>68</td>
<td>71</td>
</tr>
</tbody>
</table>

* A = Number of MTUs
** B = Percentage of MTUs

MTS High = Male Target Student - High Skilled
MTS Medium = Male Target Student - Medium Skilled
MTS Low = Male Target Student - Low Skilled
FTS High = Female Target Student - High Skilled
FTS Medium = Female Target Student - Medium Skilled
FTS Low = Female Target Student - Low Skilled
in the physical education class, the data in Table 13 also show that there was considerable variability within the three skill levels in the extent to which the sampled students grouped by sex. The data show that the high skilled students played within their skill level 88% and 85% of the time for boys and girls respectively. To the contrary, the highest percentage of Movement Task Units in which medium and low skilled males and females played together was 73%. The differences in the extent to which the same skill level pattern of grouping occurred were based upon skill level rather than sex. These recurring pattern of student groupings described above led to questions regarding how/why students came to organize themselves consistently in this manner. Exploration of this question, in turn, led to questions regarding the effect of single sex, same participant, same skill level groupings on students' engagement in academic work. To answer the first question, it was necessary to examine carefully the actions and interactions of teacher and students prior to the Entry Phase, the "official start" of lesson, as well as during the Entry Phase of the Pre-Activity Part to lesson.

Suspending the researcher role: Conducting a self-interview. To obtain information about the actions and interactions of participants prior to the Entry Phase, it was necessary for the researcher in the study to suspend herself momentarily from the role of researcher and re-enter her role as teacher. By "taking off the hat" of the researcher and "putting on the hat" of the teacher, it was possible for a self-interview to be recorded to provide
information about student grouping. This interview is recorded below:

One strategy that I used to group kids was to have the "regular" PE teachers give students directions in the lockerrooms regarding what to do about getting into groups for practice, finding a space in which to play, etc. when they entered the gym. I used this "setting up" strategy in order to save time getting kids into groups when they entered the gym. I figured they would begin to organize themselves in the lockerroom and/or as they entered the gym if they already knew how many people were to be in a playing group. I wanted to eliminate as many managerial problems as I could and I had found this strategy to be effective in other teaching situations.

The preceding self-interview with the teacher showed that prior to the "official start" of lesson, both teacher and students were involved in activity that influenced the conduct of the lesson itself.

Because the "Get into groups" directions were frequently given in the lockerrooms prior to the Entry Phase, it is possible that the teacher had tacitly encouraged single sex groupings. It is also possible that through this action, the teacher had tacitly discouraged male and female students from playing with one another.

In addition to this "pre-lesson" organizational strategy used by the teacher, there was a second structuring strategy used by the teacher during the Entry Phase (as well as in other parts and phases of the lesson). This second strategy appeared to encourage students to work with the same, rather than different, partners again and again. The maps of the instructional conversation of Lessons 1, 2, 8 and 12 revealed that almost without exception, the teacher allowed students to form their own playing units, that is, to self-select
their playing groups. This strategy, then, allowed if not encouraged, students to play consistently with the same people in the class. The result of the repeated use of both the "pre-lesson" and "Form your own group" strategies was that, as a general rule, high skilled students appeared to play with the same high skilled students of the same sex, medium skilled played with the same medium skilled of the same sex, and so on. Based upon the analysis of the patterns of grouping for six systematically selected students, high skilled male and female students remained in the same skill level groupings considerably more often than medium and low skilled students of both sexes.

In summary, the findings relative to the Pre-Activity Part of lesson revealed that during the first phase in each of the fourteen volleyball lessons, the Entering the Gym Phase, the teacher consistently structured or set up for lesson in a way that was managerially effective. The findings suggest caution, however, in moving to the conclusion that teacher strategies that were effective from a managerial perspective were necessarily supportive of the academic performance of students.

**General Physical Activity Part of Lesson**

The next set of findings regarding patterns of organizational stability within the fourteen day unit focuses on the second part of the macro-organizational structure of lesson - the General Physical Activity Part of Lesson. This part was the major emphasis of lesson in terms of how time was organized or spent (to be discussed in
Research Question 1.2). Figure 6 indicates that the General Physical Activity part of the lesson always consisted of one or more lesson phases. A lesson phase, in turn, consisted of one or more interrelated Movement Task Units.

Movement Task Units were interrelated as a result of the manner in which the teacher developed individual academic movement tasks (Rink, 1979). That is, when what students were asked to do motorically (i.e., the movement task) was essentially the same from one task to the next and only the substantive intent or function of the task varied (i.e., the informing, refining, extending, applying function), the tasks were considered as linked or interrelated.

These individual movement tasks are described as having a common major task. For example, when playing a two on two volleyball game (i.e., the major task) during one of the lessons, students were told in one Movement Task Unit to work on covering space defensively (i.e., a refining task). In the next Movement Task Unit students were told to increase the size of their space (i.e., extending task).

The major movement task for these two Movement Task Units was the same (i.e., two on two) yet the substantive intent or function of the task varied (refining/extending). Whenever the major movement task that students were told to work on changed, for example, moving from two on two to four on four, a new lesson phase started (See Figure 4, Phase Unit 3 & 4 in Chapter III for another example). Thus, the General Physical Activity Part of each of the fourteen lessons (i.e., the part that was the major emphasis of lessons)
consisted of one or more lesson phases - phases which focused primarily on the academic work of the physical education class and organized that work around a series of interrelated Movement Task Units.

The Movement Task Unit was the basic organizational structure for conducting academic work in the General Activity Part of lesson within and across each of the fourteen days. While the Movement Task Unit was the primary organizing structure for academic work, it was not an undifferentiated structure. It minimally consisted of two parts or phases:

1) Movement Task Presentation Phase;

2) Student Practice/Teacher Interaction Phase.

Another phase of the Movement Task Unit was also identified in some, but not all, of the Movement Task Units:

3) Transition Phase.

This third and variable phase is discussed in the Patterns of Organizational Variability section.

The Task Presentation Phase consisted primarily, though not exclusively, of the teacher giving information about the next movement task in the lesson and the students generally looking attentive while this information was presented. Subsequent to the teacher's presentation of the movement task was the Student Practice/Teacher Interaction Phase. In this Phase, students became involved in physical activity. Simultaneous with each Student Practice Phase in the Movement Task Unit for the fourteen lessons, the teacher interacted with students. While this interaction focused
on a variety of topics that were both social and academic in nature, findings presented later for Research Question 3.1 indicate that most of the teacher's interactions involved giving feedback related to students' academic motor skill performance.

In summary, the General Activity Part of the lesson consistently focused on the academic work of the physical education class. This work was conducted via a series of interrelated movement tasks for one or more major movement tasks in the lesson. Though this organizational structure for the General Activity Part of the lesson was consistent across all fourteen lessons, what could not predicted was exactly what the various movement tasks of lessons would be and when a change in task and/or phase (i.e., major movement task) would occur. What was clear, however, was that the academic work of lessons consisted of a series of closely linked tasks that were intended to refine or improve the quality of students' motor skill performance, extend upon students' abilities to use volleyball skills in progressively more complex situations, and have students demonstrate the use of their motor skills in competitive and/or self testing situations.

**Post-Physical Part of Lesson**

Examination of the Post-Activity part of the lesson, the third and final part of the macro-organizational structure of lesson, showed that this part of the lesson was a very small part of each of the fourteen lessons in the volleyball unit (This finding is further supported by the time analysis for Research Question 1.2 that follows
ain this section). This part of the lesson consisted of only one phase - Closure to Lesson.

Microanalysis of the instructional conversation for Lessons 1, 2, 8 and 12 indicated that this phase could generally be described as an "Oh gosh, our class time is up; you practiced well, we'll start with _X_ tomorrow; bring your volleyballs to the center circle; and you may go in" Phase. This Phase, and simultaneously this part of the lesson (i.e., Post Activity), functioned consistently in the manner described above for all fourteen lessons.

Both the transcripts of the instructional conversations and observation of the videotaped record of students' actions during this Phase showed that lesson was brought to a close in a manner consistent with the Entry Phase in the Pre-Activity Part of Lesson. That is, the Closure Phase structured the ending of lesson in a managerially efficient manner similar to the way in which the Entry Phase set up the beginning of lesson (e.g., Students placed the volleyballs in the designated place and walked into the lockerrooms).

The triangulation of data presented later in Section 1.4 relative to the distribution of time within the organizational structure supports that lessons were brought to a close in an efficient manner. Though in one sense a "tack on" part of the lesson, it is possible that the Post-Activity Part of the Lesson not only structured for the close of lesson but also helped to set a frame of reference for the next day's lesson (i.e., Analysis of the conversational map showed that in three of the four lessons microanalyzed, the teacher made statements during the Closure Phase
such as "Tomorrow when you come out we will ..." and "We'll pick up where we left off tomorrow.").

The findings in this Section 1.1.1 explored patterns of organizational stability within and across the fourteen lessons of the volleyball unit. That patterns of organizational stability that were extracted indicates that a structure existed. Whether or not this structure was clear to students in the class and, if so, whether or not this stability facilitated a shared frame of reference between teacher and students, could have been determined by obtaining the perspective of the participants. However, observation of the actions and interactions of participants indicates that, in fact, a shared frame did exist for being a participant in lesson.

Though stability existed in the organizational structure of lessons, lesson was not static in its organizational structure. The differentiated nature of lesson organization was highlighted via the extraction of patterns of organizational variability. These patterns are discussed below.

**Question 1.1.2: Patterns of Organizational Variability**

The findings in this section show that although the basic organization of lessons was the same for the fourteen lessons, there were also differences in the manner in which lesson was structured. Findings relative to variability in lesson organization showed there were parts of the lesson that were specific to the individual nature of lesson. Each was unique in the sense that every lesson had its own set of goals, purposes, content and so on. This uniqueness was
identified even at this broad level of lesson organization. Table 15 highlights differences in lesson organization.

Table 15 shows there were six different phases that occurred in the Pre-Activity Part of the Lesson, subsequent to the Entry Phase, with varying degrees of frequency across the fourteen lessons. In other words, these lesson phases were not consistently part of the fourteen lessons. Rather, each phase occurred only within certain lessons. Table 15 indicates the various lessons in which each of these phases was identified. A brief description of the six variable lesson phases during the Pre-Activity Part of Lesson is given below.

**Variable Lesson Phases**

**Expectation Phase**

During this phase in Lessons 1, 2, 4, 7, and 8 the teacher explicitly and proactively (i.e., rather than reactively) defined the basic requirements for appropriate social and academic participation in class (e.g., Social: "Hold the volleyballs when I'm (the teacher) talking"; "When I blow the whistle, get quiet"; Academic: "Give your very best effort at whatever I ask you to work on."). That this phase occurred early on during the unit and not past lesson eight suggests that teacher had made clear her expectations during the first half of the unit. Observations of student actions show that the rule was "in place" and had become a norm. Continued statements of expectations for appropriate conduct were not be necessary. Variability in the occurrence of this lesson phase, then, was due to the construction of a "working" norm rather than just restatements of
<table>
<thead>
<tr>
<th>Variable Lesson Phase</th>
<th>Lesson 1</th>
<th>Lesson 2</th>
<th>Lesson 3</th>
<th>Lesson 4</th>
<th>Lesson 5</th>
<th>Lesson 6</th>
<th>Lesson 7</th>
<th>Lesson 8</th>
<th>Lesson 9</th>
<th>Lesson 10</th>
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<th>Lesson 12</th>
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<th>Lesson 14</th>
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<td>Expectation Phase</td>
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<td>Orientation to Overhead Pass Phase</td>
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<tr>
<td>Superstars Information Phase</td>
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<td>Current Events Phase</td>
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<td>Orientation to Overhead Pass Phase</td>
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<tr>
<td>Thanks to the Teacher Phase</td>
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</table>
rules. This hypothesis was supported in the findings presented later for Research Question 2.1 and Research Question 3.2.1.

Orientation to Overhead Pass Phase

This phase occurred only in the first lesson. It consisted of a basic introduction to the overhead pass, a description of the conditions under which the pass was used, and a description of how the pass was performed. Once this information had been presented to students during Lesson 1, the information was not a major focus in subsequent lessons (i.e., in terms of constituting a separate lesson phase). The information presented in this phase, however, was continuously revisited by the teacher during the General Activity Part of other lessons in the fourteen day volleyball unit.

Superstars Information Phase

This phase occurred in Lessons 3, 5, and 8 and served as information-giving about the Superstars Contest, a contest held in class to determine which students were improving in their volleyball play. Although the Superstars Contest was held in lessons other than 3, 5, and 8, in these three lessons there was considerable information given relative to the organizational conduct of the contest.

Current Events Phase

This phase occurred only in Lesson 6 and was a product of the teacher having seen a replay of the 1984 Olympic Volleyball Games on television the preceding night. The teacher checked to see if any of the students had seen the replay. None had, so the teacher conducted her discussion relatively quickly (i.e., Phase Length = 1:10) and moved on to the physical activity part of the lesson.
Orientation to Forearm Pass Phase

This phase was almost identical to the Orientation to the Overhead Pass Phase in Lesson 1 (i.e., with the exception of the change in volleyball skills). This Orientation to the Forearm Pass Phase likewise occurred in one lesson only - Lesson 7.

Thanks to the Teacher Phase

This phase occurred only in the last lesson of the study. The "Thanks to the Teacher Phase" occurred subsequent to the Closure Phase and consisted of the regular teachers in the Physical Education class expressing their thanks to the teacher in the study for selecting their school, working with their students, and so on.

The six phases identified above indicate variability in the organizational structure of lessons. Though variability existed, all sources of variability (i.e., lesson phases) occurred in the Pre-Activity Part of Lesson. Further, each source of variability appeared to be related directly to the conduct of academic work in the General Activity Part of the Lesson (i.e., with the exception of the Thanks to Teacher Phase). Thus, while a focus on the social and substantive work of lessons was not limited to the Movement Task Units in the General Activity Part of Lesson, the social and substantive focus occurring prior to beginning physical activity in a given lesson had direct ties to what occurred during the Movement Task Units.
The Transition Phase: Variable Phase Within Movement Task Unit

In addition to the extraction of the six variable lesson phases discussed above, another variable part of the organizational structure of lessons was identified. This variable part of lesson organization was the Transition Phase of the Movement Task Unit. To place this phase of the Movement Task Unit in context, it is necessary to reconsider briefly the findings for Research Question 1.1.1 (i.e., patterns of organizational stability).

The findings for this question revealed that the Movement Task Unit consisted of two stable parts. First, the teacher presented information about the movement task that was intended by the teacher to be the focus of students’ work. Second, students became involved in physical activity simultaneously with the teacher, among other things, giving feedback relative to students’ motor skill performance. The Transition Phase, which was the variable phase of the Movement Task Unit, occurred between these two stable phases (i.e., subsequent to the Task Presentation Phase and prior to the Student Practice-Teacher Feedback Phase).

During the Task Presentation Phase the teacher gave information about the actual performance or practice of the movement task. The Transition Phase primarily, though not exclusively, served a structuring or an organizational function in preparation for the practice of the movement task. During the Transition Phase the teacher gave directions for organizing or structuring for task and then gave students an amount of time to perform these structuring
actions (e.g., getting in groups, selecting a space in which to play, designing boundary lines, making decisions about which tasks to practice). Table 16 indicates the length of time allowed for completion of these structuring actions (i.e., the Transition Phase). At the completion of this time students were then told to begin practice (Student Practice Phase) or were given additional information about performance of the task (a part of the Transition Phase).

Table 16 indicates that the Transition Phase occurred in all lessons but three - Lessons 5, 7, and 14. Within the twelve lessons that the Transition Phase did occur, there were 26 Movement Task Units (27%) in which this Phase was extracted. The Transition Phase was a variable phase in the organizational structure of the fourteen lessons because it was only one of two recurring ways or strategies used by the teacher to have students carry out the managerial requirements of the movement task. These requirements are discussed below.

Just as a Lesson has an organizational structure, each academic or movement task also had an organizational structure. The organizational structure consisted of those non-substantive or managerial aspects of task which the teacher expected to be performed by students prior to beginning practice of the task. Microanalysis of the instructional conversation in Lessons 1, 2, 8, and 12 revealed that students were expected to structure for the movement task by carrying out decisions and/or performing actions such as those identified in Figure 7 (Also, see Section 2.1, "Transition
Table 16

*Frequency and Length of Transition Phases During Movement Task Units in Lessons 1-14*

<table>
<thead>
<tr>
<th>Lesson</th>
<th>Total Number MTUs</th>
<th>Number of MTUs with Transition Phase</th>
<th>Length of Transition Phase(s) in Seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>13</td>
<td>1</td>
<td>:18</td>
</tr>
<tr>
<td>2</td>
<td>11</td>
<td>1</td>
<td>:28</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
<td>2</td>
<td>:38; :22</td>
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<td>4</td>
<td>6</td>
<td>2</td>
<td>:39; :45</td>
</tr>
<tr>
<td>5</td>
<td>8</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>3</td>
<td>:20; :30; 1:08</td>
</tr>
<tr>
<td>7</td>
<td>6</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>6</td>
<td>1</td>
<td>:15</td>
</tr>
<tr>
<td>9</td>
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</tr>
<tr>
<td>12</td>
<td>3</td>
<td>1</td>
<td>:23</td>
</tr>
<tr>
<td>13</td>
<td>7</td>
<td>7</td>
<td>:10; :36; :03; :18; :05; :55; :25</td>
</tr>
<tr>
<td>14</td>
<td>4</td>
<td>0</td>
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N=95  n=26  Md, = :26  X = :27  Range = :03-1:08
Figure 7. Student responsibility for the organizational structure of task.
Efficiently Norm: A Process of Making and Carrying Out Decisions for a full discussion of decisions students were expected to make).

These managerial patterns of carrying out the task that were communicated by the teacher were expected to be performed by the students in two different ways: a) patterns of structuring during Student Practice Phase of lessons and b) patterns of structuring during Transition Phase of lesson.

Variable Patterns of Structuring for Practice

Pattern of structuring during student practice phase of lesson. In 69 of 95 (75%) Movement Tasks in Lessons 1-14 the teacher gave the directions for performing tasks (i.e., in the Task Presentation Phase) and then gave the signal to "Go" - that is, to structure for task and begin practice of task immediately afterwards. The primary effect of this strategy was that students were expected to structure for the task "independently" of the teacher and to get started working at their own pace. Consequently, when managerial problems arose as a result of students' failure to carry out the appropriate structuring actions, they were typically dealt with by the teacher during the first part of the Practice Phase. Findings relative to the nature of student-teacher interaction during practice (i.e., Section 3.2.4) support this pattern of dealing with managerial problems.

Pattern of structuring during transition phase of lesson. In 26 of 95 (27%) Movement Tasks in Lessons 1-14, the teacher gave directions for structuring for task during Task Presentation, and
then gave students the signal to carry out the stated structuring actions. At the completion of time allocated for structuring (i.e., Transition Phase of the Movement Task Unit), students then were told to begin practice/or were given additional instructions regarding the movement task (n=26 MIUs). The primary effect of this pattern was that the teacher allowed students to begin practice of the movement task only after she had decided that most students had performed the organizational requirements. Thus, the teacher maintained control of the structuring for practice and no one could begin practice until the class as a whole was prepared.

Examination of the organizational demands of tasks revealed that the former strategy in which the students were expected to begin practice on their own as soon as they had completed the organizational expectation, generally was used when the managerial demands were less complex than the demands of movement tasks in which the Transition Phase was identified. Typical of the demands of less complex tasks in which the first strategy was used (i.e., less complex in terms of their organizational structure) were "You and your partner get started after you've decided which task you're going to work on" and "Decide your boundaries and you and your partner get started". The organizational demands of movement tasks in which the Transition Phase occurred, however, were typically a combination of several demands such as those identified (e.g., get into groups of four, decide on a movement task; designate boundaries, record scores etc.).
The findings presented above identified and explored aspects of the organizational structure of lesson which were variable in nature. These findings combine with the findings relative to patterns of stability in the organizational structure of lessons to provide a basic description of lesson organization.

Question 1.2: Analytic Process

Data relative to the distribution of time within the organizational structure of lesson were obtained in two ways. Though the methods of obtaining the data were slightly different, the kind of data obtained were identical. First, in the four lessons microanalyzed, data regarding the manner in which time was spent in lesson was obtained subsequent to the identification of the various conversational and hierarchical units (see Section 1.1 for a review of the process of microanalysis). Once all units had been identified via the process of microanalysis, the researcher then simultaneously followed the transcript of the instructional conversation as the videotaped record of the lesson was replayed and timed the units that were used to construct the organizational map.

The second way that data were obtained relative to the distribution of time within the organizational structure of lessons occurred in the eight lessons in which macroanalysis was the process used to construct the organizational map. In these lessons the length of the various units in the organizational map was determined simultaneously with the identification of the boundaries of each unit. Each unit was timed until its terminating boundaries were identified.
Question 1.2: Patterns of Time Distribution

Findings regarding the distribution of time within lessons are reported in two ways. First, findings focus on the distribution of time within the three parts of the macro-organizational structure of lesson (i.e., Pre-Activity, General Physical Activity, Post Physical Activity). Second, findings highlight the time students spent in physical activity and in non-physical activity. These findings are presented below.

Figure 8 shows the distribution of time within the three parts of each of the fourteen lessons identified in Section 1.1. The Post Activity Part of the Lesson, which consisted only of the Closure Phase, took the least amount of time and had the most consistent time emphasis of the three parts. Only one of the fourteen lessons (i.e., Lesson 14) had a Closure Phase that took longer than 3% of the total lesson. Figure 8 indicates that the closure time for Lesson 14 (i.e., 2:39) represented 8% of the lesson. The closure for Lesson 14 was an atypical lesson closure because the volleyball unit had concluded and the teacher in the study, who was leaving the school, has some "wrapping up" details to take care of and a "Thank you and Goodbye" to express. Thus, when this atypical lesson closure was excluded from consideration, the range in the percent of time spent in the Post Activity Part of the other thirteen lessons was 1% - 3%, a difference in real time of only :49. Though variability existed in this part of the lesson, the extent of variability was minimal.

The preceding findings support an earlier finding for Research Question 1.1.2 (i.e., Patterns of Organizational Variability). The
Figure 8. Distribution of time within lesson.
latter findings indicated the Closure Phase was used primarily to end
or bring the lesson to conclusion in a managerially effective way
(i.e., getting the volleyballs put up, having students walk into the
lockerroom, etc.) rather than, for example, to introduce new work or
to review and/or summarize the present day's work. Thus, only a
small amount of time was needed to accomplish this end.

The Pre-Activity Part of the Lesson, in comparison to the Post
Activity Part, was considerably more variable in terms of the
percentage of time spent in this part of the fourteen lessons (See
Figure 8). The greater variability in the percentage of time, as
indicated by the findings for Research Question 1.1.2 (i.e., Patterns
of Organizational Variability), was primarily a function of the
variability in phases within this part of the fourteen lessons.
Findings for Research Question 1.1.2 showed that, in addition to the
Entry Phase, there were six additional phases that occurred in
varying frequency across the fourteen lessons. Thus, lessons in
which any of these additional phases occurred (i.e., lessons 1, 2, 3,
4, 5, 6, 7, 8, 14) had a greater percentage of time spent in the
Pre-Activity Part of the Lesson than lessons in which only the Entry
Phase was identified (i.e., Lessons 9, 10, 11, 12, 13).

The range in the percentage of time spent in the Pre-Activity
Part of lessons with the "extra" phases was 5% (Lesson 8) - 44% (Lesson 3), while the range for the "Entry Phase only" lessons was 1%
(Lesson 13) - 4% (Lesson 11). With regard to the former, Lesson 3
was the lesson in which 44% of the time was spent in the Pre-Activity
Part of the lesson. This lesson can be considered atypical because
it occurred on Halloween and almost all of the students wore costumes to school. The Entry Phase to the lesson took considerably longer than most (5:15) because students modeled their costumes as they came out of the lockerrooms and the regular physical education teachers called the roll in the gym rather than in the lockerroom as was usual. In addition, the teacher in the study used the first part of the class after roll call to introduce and explain the Superstars Contest (see Section 1.1.2 for an explanation of this contest). Thus, when Lesson 3 was excluded from consideration, the range in the percentage of time spent in the Pre-Activity Part of lessons having additional phases was 5% - 24%.

Variability in the percentage of time spent in this first part of the fourteen lessons resulted in greater variability in the time spent in the General Activity Part of the fourteen lessons. Figure 8 indicates that whenever the first part of the lesson included phases other than the Entry Phase (i.e., Lessons 1, 2, 3, 4, 5, 6, 8, and 14) there was a lower percentage of time spent in the General Activity Part of the lesson than when only the Entry Phase was identified. Lesson 8 was the exception. Its "extra" phase, an Expectation Phase, lasted only :17 and thus did not reduce the amount of time spent in the second part of the lesson.

The basic reason for the variability in the percentage of time spent in the General Physical Activity part of the fourteen lessons has already been discussed (i.e., the presence or absence of "extra Phases" in the Pre-Activity Part of Lesson). A more detailed
description is given, to increase understanding of the nature of this variability.

The range in the percentage of time spent in General Physical Activity for the fourteen lessons was 53% (Lesson 3) to 99% (Lesson 13). Examination of Figure 8 for the General Physical Activity Part of lessons shows that Lesson 3 was the only lesson in which less than 74% of the lesson time was spent in the General Physical Activity Part of the Lesson. That is, with only one exception (i.e., Lesson 3), 74% - 99% of the time spent in lessons during the volleyball unit was spent in the part of the lesson that focused specifically on task presentation and practice of the academic movement task.

The findings above indicated that at the broad level of the macro-organization of lesson (i.e., the three parts of lesson), the focus of lesson was clearly academic in nature. That is, the primary emphasis was on the General Physical Activity Part of the lesson with the other two parts being supportive of what went on within the main portion of the lesson. The findings that follow examine the time spent in the actual conduct of academic work, that is, the time students spent in the Practice Phase of the Movement Task Unit.

Figure 9 gives the percentage of total lesson time spent in the Practice Phase of all Movement Task Units for the fourteen lessons in the volleyball unit (i.e., A Practice Phase began when the teacher gave the signal to "Go" at the end of the Task Presentation Phase and terminated when the teacher blew her whistle for students to stop practice). Examination of the data reveals that the range in the percentage of time spent in practice for the fourteen lessons was 28%
Figure 9. Percent total lesson time spent in practice phase of movement task unit.
(Lesson 3) to 57% (Lesson 9). Since Lesson 3 has previously been identified as an atypical lesson (i.e., the Halloween lesson), the median percentage for the fourteen lessons is also given (md.=49.5%). This statistic was felt to be a better indicator of the percentage of time spent in practice across lessons because it was sensitive to the extreme score for Lesson 3. It should be noted that with the exception of Lessons 1 and 3, all percentages were between 41% and 57%.

How students actually spent their time, that is, what the quality of the practice time was, is another question and one that simply cannot be answered by looking at a gross level of lesson organization, as has been done here. Determination of the manner in which students spend their time can best be made by examination of the actions of students while they practice. This topic, is explored in Research Question 1.3 and 3.0.

Due to the fact that in twelve of the fourteen lessons (i.e., all lessons except for 1 and 3) a minimum of 41% of total lesson time was devoted to practice of the academic movement task, questions were generated regarding the nature of the academic movement tasks that students were expected to practice. Interactions with the data thus led to Research Questions 1.3: What are the major movement tasks around which the academic work of lesson is organized?

Question 1.3: Analytic Process

Analysis of the organizational map of each of the fourteen lessons permitted the extraction of a series of eleven recurring
major movement tasks. Exploration of these eleven tasks resulted in the identification of both commonalities and differences in the nature of task requirements. This exploration led to the construction of four inductively derived categories of major movement tasks. These categories form a taxonomy of categories of major movement tasks for the fourteen day instructional unit on volleyball.

Question 1.3: Taxonomy of Major Movement Tasks

The taxonomy of major movement tasks identified in Figure 10 represented the primary academic work of lessons during the volleyball unit. The categories, and the major tasks that constituted each, are presented in the chronological order in which they were first introduced by the teacher during the fourteen day unit. In essence, this chronological listing is the series of major "teaching progressions" used by the teacher as she taught the volleyball unit.

The Categories

Category 1: Overhead Pass - Individual Working Alone

The first category in the taxonomy consisted of two major movement tasks in which a student worked independently (or was supposed to work independently) of others on the overhead pass:

a) Push Catch

b) Overhead Pass Continuously to Self

Push-catch involved the student pushing the ball into the air using an overhead passing action and, catching the ball on the first pads of the fingers while simulating the overhead passing action. These
Figure 10. Taxonomy of major movement tasks: Sequential order of presentation and practice.
two actions were continuously repeated so that the action was a simulated passing action. In the overhead pass continuously to self, the student used a striking/passing action rather than a push.

Category 2: Overhead Pass - Working with Another/Others

This category consisted of four major movement tasks identified below. All of these tasks were variations of a broader task in which one or two students continuously passed the ball over a net with one or two other students while using the overhead pass.

a) Partner toss - Overhead pass back to partner
b) One passing continuously with one
   (cooperative, rather than competitive, in nature)
c) One passing continuously against one
   (competitive, rather than cooperative in nature)
d) Two passing continuously with two
   (cooperative in nature)

Category 3: Forearm Pass - Working with Another

This category consisted of the two major movement tasks identified below. These tasks were variations of a broader task in which one student worked with one other student on passing the ball overhead the net using the forearm pass.

a) Partner Toss - Forearm pass back
b) One with one forearm pass
   (cooperative in nature)
Category 4: Overhead Pass and Forearm Pass - Working with Others

This category consisted of the three major movement tasks identified below. These tasks were variations of a broader task in which two or four students pass cooperatively or competitively with two or four other students using both the overhead and forearm passes as needed.

a) Two against two
   (competitive in nature)

b) Four with four - Toss and pass back

c) Four against four
   (competitive in nature)

A Spiraling and Overlapping Approach

The findings in this section have examined the major movement tasks around which the primary academic work of the fourteen lessons in the volleyball unit was organized. These eleven major tasks represent what at first appeared to be a bottom up or vertical approach to the development of game playing (i.e., motor) skills. In other words, the order in which the major tasks were first introduced during the unit was basically that of simple to complex in terms of the motoric demands placed on students. The steps or jumps between each major task were small, however, with respect to the increase in the complexity of the motoric demands. In addition, once a major task was introduced it became recurrent in nature. That is, it appeared in other lessons.
At this point the approach used to develop students' motor skills is renamed a spiralizing and overlapping approach rather than a vertical/overlapping approach. Table 17 should help to illustrate this recurrent spiralizing and overlapping approach to the development of game playing skills during the volleyball unit. The approach was spiralizing because the major movement tasks gradually increased in complexity as each new task was introduced. The approach is also overlapping because once a major task was introduced it was revisited on other days. Though there was variability in the frequency with which each major task reoccurred across other lessons, Table 17 shows all major tasks but two reoccurred at least one time (i.e., One with One Forearm Pass Four with Four; Toss Pass Back).

The findings thus far have provided insight into the manner in which lessons were organized during the fourteen day instructional unit. These findings indicate ways that lesson organization was a support, as well as a constraint upon the academic performance of students. The next set of findings examines the social structure of lessons.
Table 17

Frequency of Occurrence of Major Movement Tasks During Lessons

<table>
<thead>
<tr>
<th>Task Category</th>
<th>Major Movement Task</th>
<th>Lesson 1</th>
<th>Lesson 2</th>
<th>Lesson 3</th>
<th>Lesson 4</th>
<th>Lesson 5</th>
<th>Lesson 6</th>
<th>Lesson 7</th>
<th>Lesson 8</th>
<th>Lesson 9</th>
<th>Lesson 10</th>
<th>Lesson 11</th>
<th>Lesson 12</th>
<th>Lesson 13</th>
<th>Lesson 14</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Overhead Pass:</td>
<td>Push Catch</td>
<td>* *</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Individual Working Alone</td>
<td>Overhead Pass (continuously to self)</td>
<td>* * * *</td>
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<tr>
<td>II. Overhead Pass:</td>
<td>Partner Toss/Overhead Pass</td>
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<tr>
<td>Working with Another/Others</td>
<td>Back to Partner</td>
<td>* * * *</td>
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<tr>
<td>One Passing Continuously with One</td>
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<td>* * * * * * * * * * * * *</td>
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<tr>
<td>One Passing Continuously Against One</td>
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<td>* * * * * * * * * *</td>
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<tr>
<td>Two Passing Continuously with One</td>
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<tr>
<td>III. Forearm Pass:</td>
<td>Partner Toss/Forearm Pass Back</td>
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<td>* *</td>
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</tr>
<tr>
<td>Working with Another</td>
<td>One with One Forearm Pass</td>
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<tr>
<td>IV. Overhead Pass &amp; Forearm Pass:</td>
<td>Two Against Two</td>
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<tr>
<td>Working with Others</td>
<td>Four with Four: Toss/Pass Back</td>
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</tbody>
</table>
RESEARCH QUESTION 2.0: THE SOCIAL STRUCTURE OF LESSONS

The question in this section examines the nature of the social structure of lessons during the fourteen day instructional unit on volleyball. The general question guiding the analysis is:

2.0 What is the nature of the social structure of lessons, in which the academic work of lessons is embedded?

One subquestion was identified as the focus for the examination of the social structure of lessons in the volleyball unit:

2.1 What are the normative requirements for acting or conducting oneself as a student in the physical education class?

Question 2.1 is grounded in past work on the study of classroom processes conducted from a social interaction perspective (e.g., Mehan, 1979; Green & Harker, 1979). This work suggests that lessons have a set of norms or rules. These norms are patterned ways of acting (Goodenough, 1957) that provide students a framework within which to know how to act in the physical education class. Past research indicates that achievement of the academic goal(s) of instruction is facilitated when a shared frame of reference exists between teacher and students regarding normative expectations for student conduct. Further, to facilitate achievement of academic goals, the expectations must be supportive of the performance of academic work by students. Thus, not only was it important in the physical education class being studied to understand what the normative requirements for student conduct were, it was also important to understand the manner in which those requirements influenced the academic work of students.
Question 2.1: Analytic Process

Data for exploration of normative requirements for student conduct in the physical education class were obtained via a two part analytic process. The purpose of the respective parts was:

1) identification of a set of tentative normative requirements for student conduct in the physical education class (i.e., The identification of tentative norms was accomplished via analysis of the structural map. See Table 3 in Chapter III for examples of message units from which tentative normative expectations for conduct were derived); and

2) verification (i.e., confirmation/disconfirmation) of tentative normative requirements/identification of additional requirements. Verification/identification was accomplished via examination of the videotaped record of students' actions.

The product of these two parts was the extraction of a set of normative expectations for student conduct (The analytic steps that resulted in the extraction of these norms are presented in detail in of Chapter III).

Question 2.1: Normative Requirements for Student Conduct

The process of analysis resulted in the identification of a set of six major norms of student conduct in the physical education class. These findings are identified in Table 18 and presented below in narrative form. This set of norms represented the primary or macro level expectations for being a student in the class.
Table 18

**Normative Requirements for Student Action in the Physical Education Class**

1. Enter the Gym Norm
2. Listen ("Look Attentive") Norm
4. Start/Stop Physical Activity Norm
5. Keep the Volleyball "Still" Norm
6. Engage Consistently in Practice of Academic Movement Task Norm
Entering the Gym Norm

One normative expectation for students in the physical education class involved the manner in which they entered the gym and prepared themselves for participation in lesson. Upon entering the gym, students were expected to demonstrate the following behaviors:

- Self-select a playing unit;
- Find a space on the court on which to work;
- Sit down;
- Get quiet (i.e., listen/"look attentive").

This expectation was consistently communicated by the teacher as students entered the gym and consistently demonstrated as a recurring pattern of action by the students in the class across each of the fourteen lessons in the unit.

Listen ("Look Attentive") Norm

The Listen ("Look Attentive") Norm was the most dominant expectation for social conduct in the physical education class: Students were expected to listen when the teacher talked to the class. This norm was signalled verbally by the teacher and confirmed through examination of the videotaped record of student behavior and actions.

To count as listening, students had to "look attentive". "Look attentive" meant that students had to give the general appearance of attentiveness whenever the teacher was engaged in information-giving on a whole class basis (i.e., Student Entry Phase, Task Presentation Phase of the Movement Task Unit, Closure Phase, any of the variable
lesson phases in the Pre-Activity Part of the lesson). "Look attentive" generally meant a student was expected to demonstrate the following behaviors:

Stop physical activity when the whistle blows (i.e., if the information given was subsequent to a Practice Phase);
Look generally in the direction of the teacher;
Remain quiet (i.e., Do not talk).

Thus, students were expected to look as if they were listening to the teacher and were hearing what she had to say.

Triangulation of the above finding with findings on Task Presentation (i.e., Research Question 3.1) was used to assess whether students actually were attentive and understood the stated expectations for practice, or whether they merely displayed attention-like behaviors (i.e., See Section 3.1 for a full discussion of initial engagement). By examining whether students were able to engage in appropriate action in the performance of the academic movement task, it was possible to determine whether students had attended to the information being presented. The median percentage of students initially engaged appropriately in the teacher stated major movement task during Movement Task Units in Lessons 1, 2, 8, and 12 was 88%, 90%, 100%, and 100% respectively. In addition, across the fourteen lessons, the three Movement Task Units in which initial appropriate engagement was less than 84% occurred early on in the volleyball unit during Lesson 1 (n=2) and Lesson 2 (n=1) (i.e., An elaborated discussion of these findings appears later in this Chapter). Thus, the data indicate that students were attentive
during the teacher's explanation and that they understood the expectations for practicing the major movement task.

Transition Efficiently Norm: A Process of Making and Carrying Out Decisions

Triangulation of findings relative to the "transitioning" norm with findings from Sections 1.1.2, 3.1, and 3.2.4 involved examination of data relative to the organizational arrangements of the academic movement task. Findings reported earlier showed that just as lessons had an organizational structure, the academic movement task also had an organizational structure. The organizational structure consisted of a set of non-substantive or managerial decisions that the teacher expected students to make and carry out prior to beginning practice of the movement task. Triangulation of these findings (i.e., from Section 1.1.2) with findings of the second norm indicated that making decisions and carrying out those decisions during transition to practice was a recurring pattern of student action in the physical education class. The structural map showed that this normative requirement for student action was signalled by the teacher during the Task Presentation Phase of the Movement Task Unit. Observation of the videotaped record of students' actions confirmed that during transition students were regularly expected to make and carry out decisions relative to three primary aspects of daily life in the gym (See Figure 11):

1) Decisions about choice of academic movement task (i.e., what to practice):
Figure 11. Transition efficiently norm: A process of making and carrying out decisions.
2) Decisions about choice of partner(s) (i.e., with whom to practice); and
3) Decisions about arranging practice environment (i.e., practice under what conditions).

With regard to the first dimension, exploration of the structural maps showed that students were asked to choose, that is, make a decision about which movement task they were going to practice in 58% of the Phase Units (i.e., 15 out of 26) across the fourteen lessons in the volleyball unit (See Table 19). In each instance the teacher gave students two or three movement tasks of varying difficulty from which they were then expected to select one. Thus, students were regularly delegated decision making powers (58% of time), within the limits of the defined choices, regarding the specific focus of their academic work (See 3.1 for additional discussion on student decision making and academic tasks).

Students were also expected to make a second set of decisions during transitions regarding with whom they would practice the major movement task. Analysis of the structural maps showed that the teacher consistently, that is, without variation, used the same organizational strategy for getting students into playing units for practice: Students were told to form their own groups. Triangulation of findings for Research Question 3.2.4 presented later in this chapter showed that the teacher intervened in the decision making process only when a student indicated he/she was unable to get a partner. This intervention occurred almost exclusively at the beginning of the Practice Phase after students had been given the
<table>
<thead>
<tr>
<th>Lesson</th>
<th>Total Phases in General Activity Part of Lesson</th>
<th>Number of Phases in General Activity Part of Lesson in Which Choice Was Given</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>1</td>
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<tr>
<td>4</td>
<td>1</td>
<td>0</td>
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<tr>
<td>5</td>
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<td>11</td>
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<td>12</td>
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<tr>
<td>13</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>14</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

N = 26  N = 15

Percent Phase Units with Choice of Movement Task = 58%
signal to begin practice. These findings revealed that students were given absolute autonomy, unless they chose to abdicate that autonomy, in making decisions regarding who they would work with in carrying out the academic work of the physical education class.

The third and last dimension of life in the physical education class that students were regularly expected to make decisions about during transitions was related to the conditions under which the practice of academic work was to occur. Analysis of the structural map revealed that students were regularly expected to make decisions regarding where they would practice (e.g., on what part of the court), who they would practice near, where to place the boundary lines for their playing area, whether they would play up-back or side by side, and so on.

Testing for Efficiency

To obtain information relative to the level of efficiency with which students accomplished the decision making requirement and began practice, data were collected on the length of transition time for each playing unit on alternating sides of the playing court during Movement Task Units in a systematically selected sample of lessons (i.e., n=10). This utilization of time as the performance measure, however, provides only general information about the effectiveness with which the transitions were performed. The work of Alexander (1982) showed that when efficiency in transitioning was determined by considering both time and distance students had to travel, a more revealing description of efficiency in transitioning was obtained.
Each playing unit on the side of the court sampled was timed from the point of the teacher's signal "Go" (i.e., given at the end of the Task Presentation Phase) to the point of completion of the organizational expectations and actually beginning practice of physical activity. Finally, for each Movement Task Unit sampled, the researcher calculated the median time in seconds it took playing units to get started with physical activity.

The findings from the time analysis are presented in Table 20. Table 20 indicates the distribution of the median times for beginning physical activity by playing units within and across the ten lessons sampled. The data show that variability existed in the amount of time it took students to carry out the organizational arrangements of the managerial task (Range = 4.9 seconds to 1:31). While variability existed, the degree to which it was present was relatively small. Examination of the data in Table 20 shows that seven out of the ten lessons sampled had a median time for beginning practice that was less than nine seconds and that eight out of the ten lessons had a median time less than 14 seconds (i.e., Lessons 9 and 14 had median beginning activity times of :26 and 1:31 respectively). Though not explored here, it would be possible to determine the reasons for these atypical times, and thus increase understanding of possible factors impacting upon the performance of academic work, by reentering the data to examine qualitative factors influencing students' performance of the managerial task.

To explore further the question of student efficiency in making and carrying out decisions relative to the organizational task,
Table 20

Distribution of the Median Times in Seconds for Beginning Physical Activity by Playing Units During Sampled Lessons

<table>
<thead>
<tr>
<th>Number of MTUs</th>
<th>L.1 (MTUs=13)</th>
<th>L.2 (MTUs=11)</th>
<th>L.3 (MTUs=3)</th>
<th>L.5 (MTUs=4)</th>
<th>L.7 (MTUs=6)</th>
<th>L.8 (MTUs=3)</th>
<th>L.9 (MTUs=4)</th>
<th>L.11 (MTUs=2)</th>
<th>L.12 (MTUs=2)</th>
<th>L.14</th>
</tr>
</thead>
<tbody>
<tr>
<td>MD</td>
<td>3</td>
<td>5</td>
<td>8.5</td>
<td>6.7</td>
<td>5</td>
<td>5.5</td>
<td>26</td>
<td>3.5</td>
<td>91</td>
<td>13.5</td>
</tr>
<tr>
<td>X</td>
<td>4.9</td>
<td>4.9</td>
<td>7</td>
<td>9</td>
<td>9</td>
<td>11.8</td>
<td>24</td>
<td>11</td>
<td>1:31</td>
<td>13.5</td>
</tr>
<tr>
<td>MD</td>
<td>4</td>
<td>4</td>
<td>8</td>
<td>9</td>
<td>9</td>
<td>11.8</td>
<td>24</td>
<td>11</td>
<td>1:31</td>
<td>13.5</td>
</tr>
</tbody>
</table>

Lesson MD = 6.1

Lesson X = 18.6
Movement Task Units were collapsed according to the median time taken by playing units to begin practice. These data are shown in Figure 12. The findings show that in 78% (i.e., 39 out of 51) of the Movement Task Units in the ten lessons sampled, the median time for beginning practice among playing units was ten seconds or less. In 86% of the Movement Task Units (i.e., 44 out of 51), the median time was less than 20 seconds. When the data in Figure 12 were examined one step further, the findings show that in 92% of the Movement Task Units (i.e., 44 out of 51) during the ten lessons, students had begun practice in less than 30 seconds.

These findings show then, that efficiency in transitioning, that is, efficiency in making and carrying out decisions relative to the expectations of the managerial task, was a patterned way of acting in the physical education class. This norm was supportive of the academic work of lesson.

**Start/Stop Norm**

Examination of how the teacher began and ended lesson led to the identification of the Start/Stop Norm. This norm highlights the expectations for beginning and ending practice during the Movement Task Units in the four lessons microanalyzed.

The structural map showed that the teacher gave a signal (e.g., "Go", "Let's get started") at the end of all thirty-five Task Presentation Phases in the four lessons microanalyzed. This recurring pattern of interaction signalled the expectations for behavior:
Figure 12. Movement task units collapsed according to the median time by playing units to begin practice.

Number of Movement Task Units

Median Time in Seconds

2 4 6 8 10 12 14 16 18 20 22 24 26 28 30-51
Students were allowed to "become inattentive" to task presentation and to begin organizing for practice and/or practicing only after the signal permitted this shift in action.

Students were also expected to stop practice when the signal was given. This norm was signalled by the teacher blowing her whistle. Examination of students' actions during Movement Task Units revealed that when the teacher blew the whistle at the end of the thirty-five Practice Phases during Lessons 1, 2, 8, and 12, the expectations for student behavior were:

Stop practice quickly and become (i.e., "look") attentive.

"Stopping practice quickly" meant that 90% of the students who were observed discontinued practice when the teacher blew the whistle at the end of the Practice Phase and became attentive within a maximum of ten seconds. Thus, a normative expectation existed in the class regarding when students were expected to begin and end practice of academic movement tasks in this physical education class. This norm contributed managerially to the conduct of academic work in the physical education class: The shift "to and from attentiveness" during task presentation was directed by the teacher and the flow of the lesson was maintained.

Keep the Volleyball "Still" Norm

Analysis of the structural map resulted in the identification of the "Keep the Volleyball Still" Norm. This fourth normative expectation for conduct was, in some ways, a subcomponent or
sub-norm of the Listen ("Look Attentive") Norm - the primary expectation for student conduct in the physical education class. Keeping the volleyball "still" was actually one part of both the concept and operational definition of "looking attentive". To "look attentive" (and thus display appropriate student action), one had to display the behaviors of the Listen Norm and Keep the Volleyball "Still" Norm. The latter norm is presented here as a separate norm, however, as a result of the emphasis it received in the teacher's attempts to establish and maintain the normative status of this rule of conduct.

Examination of the videotaped record of students' actions during the Task Presentation Phase typically showed students demonstrating the following behavior:

Students stood with a volleyball either in their hands or on the floor.

There was a considerable range, however, in what behaviors the teacher allowed or accepted as keeping the ball "still". The acceptable behaviors ranged from:

Placement of the ball on the floor by the student
to flipping the ball from hand to hand/twirling the ball on the fingertips.

This norm, though conceptually and operationally a part of the Listen ("Look Attentive") Norm, was in and of itself not a major source of influence on students' performance of academic work. When examined as part of a larger whole, however, this norm potentially facilitated students' attentiveness to information presented about the academic work of lesson by eliminating a potential distractor.
(i.e., playing with the volleyball) during the presentation of this information.

**Engage Consistently in the Practice of the**

**Academic Movement Task Norm**

A sixth, and final normative expectation in the physical education class was directly related to the performance of academic work:

Students were expected to engage consistently in the teacher stated major movement task.

This norm is included here because it was signalled consistently by the teacher during face-to-face interaction with students, on an individual and whole class basis, when students were involved in practice and non-practice activities, throughout the various phases of lesson. Given the fact that this normative expectation is tied directly to the conduct of academic work, a full discussion of the norm appears in Section 3.1, rather than here.

The findings in this section highlighted six normative expectations for student conduct in the physical education class. These norms were patterned ways of acting that provided students a framework within which to know how to act in the physical education class.
RESEARCH QUESTION 3.0:
ACADEMIC STRUCTURE OF THE MOVEMENT TASK

The question in this section examines the nature of the academic movement tasks across the fourteen lessons in the instructional unit on volleyball. The general question guiding the analysis in this section is:

3.0 What is the nature of the academic structure of the Movement Task Unit in the volleyball unit?

While academic content may occur in the Pre-Physical Activity Part of the lesson (e.g., Orientation to the Overhead Pass Phase), the Movement Task Unit is the primary source of academic information in a lesson. The Movement Task Unit is the principle structure of the General Physical Activity Part of the lesson. Therefore, the discussion of academic task and academic structure of lesson will focus on the Movement Task Unit within and across lessons.

Information about other aspects of academic information is presented in the first part of this chapter in Section 1.1 on the Organizational Structure of Lessons.

While the Movement Task Unit is the primary source of academic work in lessons, it is not an undifferentiated structure. Rather, a Movement Task Unit minimally consists of a Task Presentation Phase and a Student Practice/Teacher Interaction Phase. In some Movement Task Units a third phase may occur, a Transition to Physical Activity Phase. This phase is a managerial phase that serves a structuring function for presentation and/or practice of a movement task. It will not be considered here since it is not academic in nature (See
Section 1.1.2 on Organizational Structure in this chapter for a discussion of this Phase.)

Given the differentiated nature of the Movement Task Unit, to answer question 3.0 required the consideration of a series of sub-questions:

3.1 What is the nature of information communicated to students during the Task Presentation Phase of the Movement Task Unit?

This question was derived from traditional research on teaching in physical education (Graham, 1983; Pieron & Graham, 1984). "Task presentation" has been a construct of considerable interest among researchers examining the teaching-learning process from a process-product program of research. Further, recent work on the study of teacher knowledge (e.g., Shulman, 1986; Erickson, 1986) has begun to examine, among other things, ways that teachers acquire knowledge and ways in which that knowledge gets transformed and presented to students. Thus, the question guiding the observation and analysis in the present section is grounded in both past and recent work on instruction.

3.2 What is the nature of students' participation and information communicated by the teacher during the Practice Phase of the Movement Task Unit?

3.2.1 What is the nature of students' engagement in the stated movement task during the Practice Phase of the Movement Task Unit?
3.2.2 What is the nature of students' efforts to modify the stated movement task?

3.2.3 What is the nature of teacher response to students' efforts to modify the stated movement task?

3.2.4 What is the nature of teacher response to students' efforts to modify the stated movement task?

3.2.5 What is the nature of students' motor skill performance during the Practice Phase of the Movement Task Unit?

The questions are interrelated. Questions 3.2.1, 3.2.4, and 3.2.5 were part of the initial set of questions identified at the onset of the study. These questions were derived from past literature and from the conceptualization of the gymnasium as an active communicative environment. Question 3.2.2 and 3.2.3 were identified during data analysis. During this phase, it became apparent that some students attempted to modify the academic movement task and that the teacher responded to such attempts in various ways. Thus, Questions 3.2.2 and 3.2.3 were generated to examine the nature of the modification process and the teacher's responses to student attempts.

Question 3.1: Analytic Process

The question in this section examines the nature of teacher communication regarding the movement task prior to practice of the task. The question guiding the analysis is:
3.1 What is the nature of information communicated to students during the Task Presentation Phase of the Movement Task Unit?

Data for exploration of patterns of information communicated by the teacher during the Task Presentation Phase of the Movement Task Unit were obtained via the process of microanalysis of the instructional conversation of the four theoretically selected lessons (i.e., Lessons 1, 2, 8, 12). Data were obtained by searching the structural maps for recurrent patterns of interaction during each Task Presentation Phase of all Movement Task Units in the four lessons. Concurrent with the search of the structural maps, the videotaped record of each Task Presentation Phase was reviewed. Thirteen recurring patterns were identified. From these patterns thirteen inductively derived constructs of action and interaction were extracted.

Question 3.1: Patterns of Information

The constructs are presented in Table 21 and discussed below. They are presented in the order of the frequency with which each appeared across the thirty-three Task Presentation Phases in the Movement Task Units in the four lessons microanalyzed (i.e., Lessons 1, 2, 8, 12).

Critical Performance Elements

The construct of "critical performance elements" refers to interactions in which the teacher identified specific critical performance elements relative to 1) individual offensive and
Table 21

Frequency of Occurrence of Constructs of Action and Interaction During Task Presentation in Four Lessons

<table>
<thead>
<tr>
<th>Construct</th>
<th>Lesson 1</th>
<th>Lesson 2</th>
<th>Lesson 8</th>
<th>Lesson 12</th>
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<td>4</td>
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<td>25</td>
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<td>2</td>
<td>22</td>
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<td>Demonstration of Movement Task</td>
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<td>8</td>
<td>4</td>
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<td>21</td>
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<td>Organizational Structure of Movement Task</td>
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<td>2</td>
<td>3</td>
<td>1</td>
<td>19</td>
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<tr>
<td>Praise for Preceding Practice/Challenge for Future Practice</td>
<td>5</td>
<td>9</td>
<td>4</td>
<td>1</td>
<td>19</td>
</tr>
<tr>
<td>Use of Negative Examples</td>
<td>7</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>Signaling Listen Norm</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>12</td>
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<tr>
<td>Summary/Repetition of Work Expectations</td>
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<td>3</td>
<td>4</td>
<td>2</td>
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<td>0</td>
<td>2</td>
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</tbody>
</table>

n=66  n=52  n=31  n=16  N=161
defensive strategies of play and 2) the topography or physical
features of students' motor skill performance. These elements
represent the aspects of motor skill performance emphasized by the
teacher in 76% (i.e., 25 of 37) of the movement tasks (e.g., "Lay
your units back."); "Contact the ball on the first pads of your
fingers."); "Call Mine before you contact the ball."). These elements
served as a focus for student attention on specific dimensions of
skill performance. Analysis of the elements stressed by the teacher
indicates that the instructional focus in the physical educational
class was on the qualitative or refining (Rink, 1979) aspects of
motor skill performance. These critical performance elements are
explored later in this section.

Performance of the Major Movement Task

The construct of "performance of the major movement task",
appearing in 76% (or 22 out of 30) of the Task Presentation Phases
refers to a recurring pattern of interaction in which specific
reference was made by the teacher regarding performance of the major
movement task (e.g., "Remember, you are playing a two-on-two game.");
"When you get started, get with your partner and pass continuously as
many times as you can."). The major movement tasks around which the
academic work of lessons was organized are discussed in Section 1.4.
The teacher's recurring reference to performance of the major
movement task in 67% of the Task Presentation Phases helped to focus
students' attention on the academic work expectations.
When this construct was combined with the construct of critical performance elements, a refinement of the emerging picture of instruction obtained. The data indicate that a primary expectation was for students to focus on a combination of these critical performance elements while practicing a particular major movement task. For example, in Movement Task Unit 5 in Lesson 1, the teacher's statements show that she expected students to focus on: 1) wrists laid back and 2) catch on first pads of finger while practicing the "push-catch" major task.

**Demonstration of the Movement Task**

"Demonstration" occurred in 64% of the Task Presentation Phases (21 of 33). This construct refers to the teacher's physical (i.e., nonverbal) demonstration of the movement task students were expected to practice. Demonstrations in the present class were of two types: full (n=12) and partial (n=9). To be counted as a full demonstration, a minimum of one full performance or repetition of the actions inherent in the movement task had to be demonstrated. These findings show that communication about academic work expectations in the present class was, therefore, both verbal and nonverbal.

**Organizational Structure of the Movement Task**

The "organizational structure of the movement task" is a construct that refers to a recurring pattern of interaction intended to focus students' attention on the nonsubstantive or managerial aspects of the movement task. These aspects were actions the teacher expected students to perform or carry out in the Practice Phase...
and/or Transition Phase prior to beginning practice of the task. This construct was identified in 56% of the Task Presentation Phases (19 out of 33). The organizational structure of the movement task is discussed more fully in Sections 1.1.2 and 2.1.

Praise for Preceding Practice/Challenge for Future Practice

This construct refers to interactions in which the teacher either praised students for work performed in the Practice Phase of the preceding Movement Task Unit (e.g., "Boy did you do that well."; "You moved super that time.") or challenged students in their performance of work for the immediately proceeding Student Practice Phase (e.g., "See if you can do more passes without stopping this time than you did the last."; "I want you to do move even better this [next] time."). This construct occurred in 56% of the Task Presentation Phases (19 out of 33).

Use of Negative Examples

The teacher used negative examples to help explain both the basic requirements of the major movement task (e.g., "Toss three and switch, with your partner; Don't pass continuously) and critical performance elements (e.g., "You should not contact the ball outside of the midline of your body.") in 36% of the Task Presentation Phases (12 out of 33). In each Task Presentation Phase in which a negative example was used, there were also messages that defined what students were supposed to do. Thus, the combined effect of both negative and positive examples was "Don't do ________, do ________." and vice versa.
Signaling "Listen ("Look Attentive") Normative Expectation of Conduct

The "signaling" construct refers to a recurring pattern of interaction in which the teacher signaled the "Listen Norm" in one of two ways (i.e., See Section 2.1 presented earlier in this chapter for a full discussion of this norm). This construct occurred in 36% of the Task Presentation Phases (12 out of 33). One type of signal, reactive signaling, occurred when the teacher responded or reacted to a breach in the requirements by a student or students (i.e., Reactive signaling appeared as Potentially Divergent Units on the structural map since this type of signal tended to break the forward movement of the lesson; See Appendix A for a discussion of Potentially Divergent Units). The second type of signal occurred when the teacher signaled the norm in a proactive fashion in order to help structure for the display of the expected behavior/actions. Observation of the videotaped record indicated that attentiveness to the explanation of academic work expectations was an expectation in this physical education class. The second type of signal, then, was proactive signaling.

Summary/Repetition of Work Expectations

The construct of "summary/repetition of academic work expectations" occurred in 30% of the Task Presentation Phases (10 out of 33). This construct refers to a pattern of interaction in which the teacher, immediately prior to giving the signal to begin practice, summarized or repeated part or all of the expectations for
practice. The summary or repetition was based upon work expectations stated earlier in the same Task Presentation Phase.

Restatement of the Movement Task from the Preceding Movement Task Unit

This construct describes a pattern of interaction in which the teacher restated the movement task work expectations from the Task Presentation Phase in the immediately preceding Movement Task Unit. This construct occurred in 21% of the Task Presentation Phases (7 out of 33). This construct was used, or functioned, in two different ways. One way in which task restatement functioned was to facilitate construction of a shared frame of reference in four Movement Task Units regarding academic work expectations. Analysis indicated this strategy was used in the next Movement Task Unit that occurred following a Movement Task Unit when there was a reduced level of understanding between teacher and students regarding the expectations for the conduct of academic work in the Practice Phase of the Unit. Reduced understanding of work expectations was caused by a lack of clarity on the part of the teacher. Analysis of the Task Presentation Phase showed that the lack of clarity was caused by one of three conditions:

1) There was a lack of explicitness on the teacher’s part regarding what students were supposed to do;

2) There was so much information given during the Task Presentation Phase that appeared difficult for students to identify the most salient requirements for work;
3) There was contradictory information presented (e.g., the teacher told students to do one thing and demonstrated something different.

The second way in which task restatement was used or functioned occurred in the case of three Movement Task Units in which the level of consistent engagement in the Practice Phase was already high. In the Task Presentation Phases of the Movement Task Units that followed these Practice Phases of high engagement, the task restatement had "Go For It!" function. This "Go For It" task was used to exhort students to work harder at performance of the stated work requirements.

The construct of task restatement, therefore, was at least a two dimensional construct given the two different purposes it served. The form of the construct was the same in both cases; The manner in which the construct functioned, however, varied.

**Choice Among Tasks**

"Choice Among Tasks" is a construct that refers to a recurring pattern of interaction in which the teacher designated either two or three major movement tasks as choices for the focus of student practice. This pattern occurred in 18% of the 33 Task Presentation Phases (6 out of 33) (See Sections 1.4 for the taxonomy of major movement tasks). Students were expected to select one of the major movement tasks to practice. Analysis showed that in six out of the seven instances the "choice among tasks" construct occurred in the
first Movement Task Unit of a Phase Unit. Thus, the choice of task students made was a contributing factor to determined the nature of academic work not only for the Movement Task Unit in which the construct occurred, but also for the entire phase unit.

**Teacher Tells Students Performance Will Be Monitored**

This construct refers to a recurring pattern of interaction in which the teacher designated a movement task(s) for students to practice and then told students she would actively monitor their practice/provide feedback relative to their conduct of work (e.g., "I'll tap you on the shoulder if you're doing that well."); "When I come to your group, I want you to tell me which task you've decided to work on."). This pattern occurred in 12% of the 32 Task Presentation Phases (4 out of 33).

**Teacher Checks (i.e., Asks Questions About) Performance from the Preceding Task**

This construct refers to the teacher monitoring or checking performance on a post hoc practice basis via a questioning strategy. This strategy required students to provide information about the nature of their local motor skill performance subsequent to practice of a movement task (e.g., "How many of you did better that time than you did before?"; "Who did more than five in a row?"). This pattern occurred in 9% of the 32 Task Presentation Phases (3 out of 33).

**Teacher Guides Decision Making for Choosing Task**

A construct presented earlier described a recurrent pattern of interaction in which the teacher gave students a choice among major
movement tasks to practice. Closely related to that construct is the pattern in which the teacher provided information to guide the decision making process for selection of a task (e.g., "If you can really say that you did really well at that [preceding] task, then stop work on that activity and do this [teacher explains]."; "If you and your partner were both able to pass a tossed ball so that your partner didn't have to move more than one step in any direction to catch it, then you should probably move on to partner passing."). Data presented earlier in Table 21 show that in the four lessons analyzed there were six occurrences in which students were given a choice of tasks. To the contrary, the construct of "guiding decision making" relative to these choices occurred only twice. Thus, there were five instances in which students were expected to make decisions regarding academic work without the guidance of "expert advice" from the teacher.

To summarize, thirteen constructs were extracted from the Task Presentation Phases of the thirty-three Movement Task Units in the four lessons microanalyzed (i.e., lessons 1, 2, 8, and 12). These constructs represented recurring patterns of action and interaction during the Task Presentation Phase of lessons. The description of "task presentation" provided by these constraints is necessarily a constrained view of this instructional process. To increase understanding of the supports and constructs of task presentation on the academic work of students, it would be necessary to look locally within the Task Presentation Phase of the Movement Task Unit to determine the manner in which these constructs combine to form larger
patterns to present information about the conduct of academic work. While this level of description, and understanding, is not provided here, an indepth look at one construct is provided below.

An Indepth Look at One Category: Critical Performance Elements

Given that the most frequently occurring construct, Critical Performance Elements, provided a major instructional focus in terms of students' motor skill practice, questions were raised about the nature of the critical performance elements communicated by the teacher during the Task Presentation Phase. To determine the nature of the critical performance elements, it was necessary to reenter the structural map of the instructional conversation.

Once the structural map was reentered, data were obtained by searching for message units where critical performance elements were identified. Beginning with Lesson 1, therefore, critical performance elements were extracted for each Movement Task Unit in which the construct appeared in the four lessons. Thus, data were obtained relative to both the specific critical performance units that were identified by the teacher and the frequency with which each appeared in Task Presentation Phases across the four lessons analyzed. Thirteen critical performance elements were identified. Analysis of these elements resulted in the identification of three inductively derived categories of critical performance elements. These categories, the critical elements that constituted them, formed a typology (See Table 22).
### Taxonomy of Critical Performance Elements

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>CRITICAL PERFORMANCE ELEMENT</th>
</tr>
</thead>
</table>
| Critical Performance Elements Related to the Overhead Pass (n=18) | Keep the wrists laid back.  
Contact the ball quietly on the first pads of the fingers.  
Form a triangle with the thumbs and index fingers.  
Contact the ball six inches above the forehead.  
Keep the elbows to the side prior to ball contact.  
Extend the legs simultaneously with ball contact. |
| Critical Performance Elements Related to Preparatory Movement (n=25) | Move quickly  
Move and get the feet, hips, shoulders, pointed in the direction you are going to pass.  
Move and get frozen. |
| Critical Performance Elements Related to Individual Offensive and Defensive Strategies of Play (n=11) | Get back to home base.  
Take (play) only the balls that come into your half of the playing space.  
"Open up" to signal the person behind you know are not going to play the ball and that he/she should.  
Call "mine" quickly and early. |
Categories in the Typology

Critical performance elements related to the overhead pass. The first category of critical performance elements focused exclusively upon the topography of the overhead pass. Specifically, the critical performance elements in this category referred to the students' performance of the overhead pass from the point where the student was stationary and waiting to contact the ball through the follow through motion after contact (i.e., This action excludes critical elements relative to the player's preparatory action prior to contact). Six critical elements constituted this category. These elements and the frequency with which each appeared across the four lessons appears below.

Keep the wrists laid back. 2
Contact the ball quietly on the first pads of the fingers. 4
Form a triangle with the thumbs and index fingers. 2
Contact the ball six inches above the forehead. 7
Keep the elbows to the side prior to ball contact. 1
Extend the legs simultaneously with ball contact. 2

\[ N = 18 \]

Critical performance elements related to preparatory movement. The second category of critical performance elements included those that focused upon the preparatory movement of the student. Preparatory movement was movement of the student from one place on the court to another prior to the point of becoming stationary/reaching stability. Three critical performance elements constituted this category.

Move quickly . 21
Move and get the feet, hips, shoulders, pointed in the direction you are going to pass 3
Critical performance elements related to individual offensive and defensive strategies of play. The third category of critical performance elements included these elements that focused upon individual offensive and defensive strategies of play. This category highlighted elements of play apart from the actual overhead or forearm passing action. The emphasis in this category was on strategies of movement in relation to both other players and space.

- Get back to home base.  
- Take (play) only the balls that come into your half of the playing space.  
- "Open up" to signal the person behind you know you are not going to play the ball and that he/she should.  
- Call "mine" quickly and early

The discussion above explored the most frequently occurring construct during the Task Presentation Phase of Lessons 1, 2, 8, and 12. Highlighted specifically were three inductively derived categories of critical performance elements, as well as the specific elements that constituted them. These critical elements were identified by the teacher as a major instructional focus in the practice of the academic movement task.

Examining Effectiveness: A Communicative Perspective

The general description of the thirteen constructs that was provided earlier, as well as the more indepth look at the primary "Critical Elements" construct that just preceded, provided a description of what information got communicated during the Task.
Presentation Phase of the Movement Task Units. These constructs, however, provided little indication of the effectiveness of communication. Given the goal of the research is to determine the supports and constraints upon students' academic performance, at least two additional questions must be asked: Did what got delivered facilitate the construction of a shared frame of reference between teacher and students and did that shared frame, in turn, facilitate the conduct of academic work?

To answer these questions it was necessary to examine at least the nature of students' initial engagement in practice of the academic movement task. The assumption was that if students were appropriately engaged initially, then the communication of information about the conduct of academic work had been done effectively. This measure of effectiveness, then, was different from that used in traditional research on teaching, namely, student learning (i.e., as usually determined by gain scores on an end-of-instruction product measure(s)). In the present case, the measure of effectiveness was more closely related to the nature of the process being studied - task presentation. When viewed in this way, effectiveness in instruction is related to the appropriate actions of students or to the demonstration of understanding within the lesson.

Data for exploration of students' initial engagement in practice of the movement task were obtained by applying Category 1, Consistently Engaged, from the four task engagement categories presented in Section 3.1 to follow, to the first three motor skill
responses of a playing unit during the Practice Phase of the Movement Task Units in four lessons sampled (See Chapter III for a full description of the coding procedures for initial task engagement). Thus, a playing unit was coded as initially engaged appropriately or not initially engaged appropriately for the Movement Task Unit.

Findings. Table 23 shows that the initial engagement findings are reported in terms of the percentage of students consistently or appropriately engaged in the teacher stated major movement task during the Practice Phase of the Movement Task Units during the four lessons analyzed. When these were data collapsed into percentage categories, 91% of the Movement Task Units (30 out of 33) had an initial engagement measure equal to or above an 84% engagement rate. Only 3 (9%) were below 84% initial engagement rate (i.e., Table 23 shows these were in Lessons 1, Phase Unit 5, Movement Task Unit 1; the first Practice Phase and first Movement Task Unit; Lesson 1, Phase Unit 6, Movement Task Unit 1; and Lesson 2, Phase Unit 3, Movement Task Unit 3). A measure of 84% meant that approximately 27 students out of 32 on roll were appropriately engaged initially. When the median percentage of students initially engaged during Movement Task Units in the four lessons was taken as the measure, the level of engagement was relatively high-88%, 90%, 100%, 100% respectively. The data indicate, therefore, that the communication of information during the Task Presentation Phase had been done effectively.
Table 23

Percentage of Students Appropriately Engaged Initially in Practice of
The Major Movement Task

<table>
<thead>
<tr>
<th>Lesson</th>
<th>Phase Unit</th>
<th>Movement Task Unit</th>
<th>Percent Initially Engaged</th>
<th>Lesson</th>
<th>Phase Unit</th>
<th>Movement Task Unit</th>
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</table>
Question 3.2.1: Analytic Process

This question in this section examines the nature of students' participation in academic work. Data for exploration of student engagement patterns were obtained from the videotape records using a series of data construction and analysis steps. Step 1 involved writing a systematic description on a student-by-student basis of the observed engagement in Lessons 1, 2, 8, and 12 - the microanalyzed, theoretically selected lessons. This step led to the analysis of patterns of student engagement in Step 2. In Step 2, analysis involved a systematic search for recurring patterns of student engagement. Four patterns of engagement were identified: consistently engaged in the teacher stated major movement task during the Practice Phase of the Movement Task Unit, mostly engaged, partially engaged, and rarely engaged. These patterns can be placed on a continuum from low engagement to high engagement. (See Figure 13). The categories also form a taxonomy that can be applied to analysis of student engagement across all lessons (See Table 24). Step 3 involved analysis of student engagement across lessons using the Taxonomy of Categories of Student Engagement. This analysis involved a two part process.

Part 1 consisted of microanalysis of student engagement in the academic major movement task during the Practice Phase of the Movement Task Unit. This Part involved using the four categories to code students' participation in the Practice Phase of each Movement Task Unit during lessons that were microanalyzed (i.e., Lessons 1, 2,
Figure 13. Continuum of student engagement in academic work.
Table 24

**Taxonomy of Categories of Student Engagement**

<table>
<thead>
<tr>
<th>Category</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>consistently engaged</td>
<td>The student consistently demonstrated performance of the major movement task and appropriate behavior/actions related to performance of that major task (e.g., retrieving balls, getting into groups, deciding boundaries) during the Practice Phase of the Movement Task Unit.</td>
</tr>
<tr>
<td>mostly engaged</td>
<td>Most, but not all, of the time the student demonstrated performance of the major movement task and appropriate behavior actions related to performance of that major task.</td>
</tr>
<tr>
<td>partially engaged</td>
<td>The student occasionally demonstrated performance of the major movement task and appropriate behavior actions related to performance of that major task.</td>
</tr>
<tr>
<td>rarely engaged</td>
<td>The student rarely, if at all, demonstrated performance of the major movement task and appropriate behavior/actions related to performance of that major task.</td>
</tr>
</tbody>
</table>
Thus, each student in the class visible on one of the four videotapes was coded as either consistently engaged in the major movement task, mostly engaged, partially engaged, or rarely engaged for each Movement Task Unit in lessons on Day 1, 2, 8, and 12.

Part 2 consisted of macroanalysis of student engagement in the major movement task during the Practice Phase of the Movement Task Unit. This Part involved coding students' participation in physical activity in lessons on Day 3, 5, 7, 9, 11, 13, and 14. A systematically selected sample of students and Movement Task Units was used for the analysis. Student engagement on these days was coded on a broader level using only two categories: consistently engaged (Category 1) or not consistently engaged (Category 2, 3, and 4). The modification was adopted so that confirmation/disconfirmation of the patterns obtained from microanalysis could be determined without continuation of the detailed microanalysis.

The product of this two part analytic process was the construction of a record of each student's level of engagement (i.e., relative to the task engagement categories) in the Movement Task Units during the ten lessons sampled. This record was called the Student Engagement Profile (A full description of the analytic process used to obtain the Student Engagement Profile is given in Chapter III). Data were obtained by determining the percentage of students consistently engaged in the major movement task (i.e., Category One) for Movement Task Units in all lessons microanalyzed and macroanalyzed. Data were also obtained by determining the
percentage of students engaged in Category Two, Three, and Four respectively for each Movement Task Unit in the four lessons microanalyzed.

Question 3.2.1: Patterns of Student Engagement

Findings relative to the level of students' engagement in the major task during the Practice Phase of the Movement Task Unit are reported at two levels of specificity. First, data obtained initially via analysis within the Movement Task Unit are summarized and presented at the macro or broadest level — the Lesson Unit. Findings are then reported at the more detailed level of the Movement Task Unit.

Findings at both levels led to the generation of Research Questions 3.2.2 and 3.2.3 (i.e., What is the nature of students' efforts to modify the stated movement task and what is the nature of teacher response to student efforts to modify the stated movement task?). To answer these questions it was necessary to look within the Movement Task Unit at what was occurring with respect to students' engagement in academic work.

Macro Level Findings Summarized at the Lesson Unit Level

Patterns of Consistent Student Engagement

The findings in this section explore the broad pattern of consistent student engagement in the academic movement task. Figure 14 shows the median percentage of students consistently engaged in the teacher stated major movement tasks (i.e., Category One) during
Figure 14. Median percentage of students consistently engaged in major movement tasks during lessons (U = unsampled lessons).
the Practice Phase of Movement Task Units (n=71) in all lessons microanalyzed and macroanalyzed (n=10). While variability existed in the level of consistent engagement, the range was relatively narrow - 75% to 92%. The data indicate that the lowest median percentage of students consistently engaged in task during the Practice Phase of Movement Task Units for the ten lessons sampled was 75% (Lessons 7 and 12), or 23 of 31 students on the class roll.

Patterns of Non-Consistent Student Engagement (Mostly, Partially, and Rarely Engaged Students)

Data relative to the percentage of students consistently engaged in the stated major movement task provide only one description of the nature of student engagement in academic work, data about the extent to which students in the class were consistently engaged in the academic work expectations of the teacher. What is missing thus far from the summary data, however, is a description of the nature of engagement of those students who were not consistently engaged during lesson, that is, those who were mostly, partially, and rarely engaged. This section presents findings relative to patterns of non-consistent engagement in work.

The percentage of students engaged in a non-consistent manner -- Task Engagement Category 2, 3, and 4 -- was calculated for each Movement Task Unit in the four lessons microanalyzed (i.e., lessons 1, 2, 8, and 12). The range in these levels of non-consistent engagement during percentages for the Movement Task Units in the four lessons is shown in Table 25. The data in this table indicate
<table>
<thead>
<tr>
<th>Task Engagement Category</th>
<th>L.1</th>
<th>L.2</th>
<th>L.8</th>
<th>L.12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mostly Engaged (2)</td>
<td>0-19%</td>
<td>0-17%</td>
<td>0-2%</td>
<td>0-30%</td>
</tr>
<tr>
<td>Partially Engaged (3)</td>
<td>0-16%</td>
<td>0-13%</td>
<td>0-7%</td>
<td>0%</td>
</tr>
<tr>
<td>Rarely Engaged (4)</td>
<td>0-3%</td>
<td>0-13%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>
variability in the percentage of students in each category during Movement Task Units both within lesson (e.g., Category 2, Compare Lesson 1: 0-19% to Lesson 12: 0-30%).

Given the range in the percentage of students non-consistently engaged within each of the three categories during Movement Task Units in a lesson, the median percentage was taken as a measure of non-consistent engagement in academic work for the lesson (i.e., See Table 26). The median percentage was taken rather than the mean because the latter is more sensitive to extreme scores.

The data in Table 26 show that while variability existed within and across task engagement categories, a pattern of non-consistent engagement could be identified. Examination of the data for Category 2 revealed that the trend across the four lessons was one of movement to increased levels of engagement in this Category (i.e., from a median percentage of 3%; Lesson 1 to 25%; Lesson 12). Findings reported here regarding patterns of non-consistent engagement indicate that students tended to be more appropriately engaged in academic work (i.e., Category 1 and 2) and less inappropriately engaged (i.e., Category 3 and 4) in practice of the major movement task across time in the 14 day volleyball unit.

Summarized findings presented thus far at the macro level of lesson revealed that consistent engagement in the academic movement task was the basic operative norm within the physical education class. Though the level of consistent engagement was generally high, variability did exist in the overall level of students' engagement within and across the lessons analyzed. Since understanding the
Table 26

Pattern of Non-Consistent Engagement: Median Percentage of Students in Non-Consistent Engagement During Lesson

<table>
<thead>
<tr>
<th>Engagement Category</th>
<th>Lesson</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>Consistently Engaged</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mostly Engaged (Category 2)</td>
<td></td>
<td>3</td>
<td>7</td>
<td>8.5</td>
</tr>
<tr>
<td>Partially Engaged (Category 3)</td>
<td></td>
<td>13</td>
<td>2</td>
<td>0.0</td>
</tr>
<tr>
<td>Rarely Engaged (Category 4)</td>
<td></td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Median % Students Per Category
nature of variability of engagement in academic work is a goal of the study, then consideration of only the summarized Lesson Unit findings is problematic. That is, since the goal is to understand better the nature of and reasons for variability in student engagement in academic work, the way in which this variability was distributed across individual students, and the resulting influence on student motoric performance, then it was necessary to look (at least) at the level of the Movement Task Unit to determine what was occurring and how it is functioning. This analysis follows.

Findings at the Movement Task Unit Level

Patterns of Consistent Engagement

Similar to the summary findings reported earlier, the present set of findings at the Movement Task Unit level regarding the patterns of consistent engagement in work is reported via a percentage measure. Findings are given relative to the percentage of students consistently engaged in the major movement task during the Practice Phase of Movement Task Units within sampled lessons. These data are shown in Table 27.

As was indicated by the summary data at the lesson level, there was variability within and across lessons relative to the percentage of students consistently engaged in the various Movement Task Units. Although variability existed, consistent engagement in work was a stable pattern of student action in the physical education class. Previous findings showed that the lowest median percentage of students consistently engaged in movement task for lesson was 75%.
Table 27

**Movement Task Units with Consistent Engagement Percentage Less Than 75%**

<table>
<thead>
<tr>
<th>Lesson</th>
<th>Phase Unit</th>
<th>MTU</th>
<th>Percentage of Students Consistently Engaged</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>1</td>
<td>59*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10</td>
<td>69*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6</td>
<td>31*</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>1</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>67*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5</td>
<td>73</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td>3</td>
<td>71</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>71</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>71</td>
</tr>
<tr>
<td>7</td>
<td>4</td>
<td>1</td>
<td>56*</td>
</tr>
<tr>
<td>9</td>
<td>3</td>
<td>1</td>
<td>71</td>
</tr>
<tr>
<td>14</td>
<td>3</td>
<td>3</td>
<td>67*</td>
</tr>
</tbody>
</table>

*Denotes tasks with percent engagement < 70%
When 75% was used as a measure of comparison, the data in Table 27 show that engagement was less than the lowest median percentage of 75% for 14 of the 71 (20%) tasks sampled across 11 lessons of the unit. Of those 14 tasks where less than 75% of the students were consistently engaged, eight (11%) of the tasks had percentages of consistent student engagement between 70% and 74%. Thus, there were six Movement Task Units (8%) of the 71 sampled across 11 lessons during the unit where less than 70% of the students were consistently engaged (i.e., approximately 22 students out of 32 on the class roll). These Movement Task Units are also identified in Table 27.

The six movement tasks where less than 70% of the students were consistently engaged occurred under one of two general conditions. The first condition was that the movement task occurred as the first or second movement task in the lesson. Table 28 shows that there were three such occurrences of tasks where less than 70% of the students were consistently engaged. The second condition was that the movement task occurred in a series of tasks where the percentage of students consistently engaged had declined (i.e., Things were "falling apart" in terms of appropriate engagement in work.) Table 28 also shows these three Movement Task Units where there was less than 70% consistent engagement.

The six movement tasks discussed above provided points of reentry into the data to help answer Research Questions 3.2.2 and 3.2.3 regarding the nature of student efforts to modify task/teacher's response to these efforts. Reentry at the first of
Table 28

Movement Task Units with Less Than 70% of the Students Consistently Engaged

<table>
<thead>
<tr>
<th>Condition One</th>
<th>Condition Two</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First or Second MTU in Lesson</strong></td>
<td><strong>Declining Engagement Task</strong></td>
</tr>
<tr>
<td><strong>Lesson</strong></td>
<td><strong>Percent Consistently Engaged</strong></td>
</tr>
<tr>
<td>PU*</td>
<td>MTU</td>
</tr>
<tr>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>4</td>
</tr>
</tbody>
</table>

*First Phase Unit in General Activity Part of Lesson.*
the three tasks for each of the two conditions led to the generation of hypotheses about what was occurring in the other cases (i.e., tasks) and the testing of those hypotheses across the other cases. Findings relative to the student modification of academic work are presented in Sections 3.2.2 and 3.2.3.

Patterns of Non-Consistent Engagement (Mostly, Partially, and Rarely Engaged Students)

Findings relative to patterns of non-consistent engagement at the level of the Movement Task Unit helped to ground the earlier, macro or lesson findings in daily participation in the Movement Task Unit. That is, while the lesson unit findings suggested a general pattern of non-consistent engagement in academic work across time (i.e., increasing Mostly Engaged (2) and decreasing Partially (3) and Rarely (4) engaged), findings at the Movement Task Unit level showed the specific distribution of students within these three categories for individual Movement Task Units in the four lessons microanalyzed. To illustrate, data are presented for Category 2, 3, and 4 during Lessons 1 and 8 (See Table 29). This illustrative data set shows that there was little if any predictability from one Movement Task Unit to the next within lesson regarding the level of students' engagement in academic work.

The quantitative findings presented in this section relative to the differential nature of students' engagement in practice of the major movement task raised questions about reasons for variability
Table 29

Number of Students Mostly, Partially, and Rarely Engaged During Movement Task Units in Two Lessons

<table>
<thead>
<tr>
<th>Category</th>
<th>Lesson 1</th>
<th>Phase Unit 5</th>
<th>Phase Unit 6</th>
<th>Phase Unit 7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MTU 1</td>
<td>2 3 4 5 6 7 8 9 10</td>
<td>1</td>
<td>1 2</td>
</tr>
<tr>
<td>(2) Mostly Engaged</td>
<td></td>
<td>2 6 0 1 0 0 1 1 3 5</td>
<td>6</td>
<td>0 0</td>
</tr>
<tr>
<td>(3) Occasionally Engaged</td>
<td></td>
<td>0 0 2 1 5 5 3 2 1 1</td>
<td>2</td>
<td>2 2</td>
</tr>
<tr>
<td>(4) Rarely Engaged</td>
<td></td>
<td>11 7 4 1 1 2 2 1 4 4</td>
<td>9</td>
<td>2 2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Category</th>
<th>Lesson 8</th>
<th>Phase Unit 4</th>
<th>Phase Unit 5</th>
<th>Phase Unit 6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MTU 1 2 3</td>
<td>0 0 3</td>
<td>6</td>
<td>5 2</td>
</tr>
<tr>
<td>(2) Mostly Engaged</td>
<td></td>
<td>Number of Students Per Category</td>
<td>1 2 2</td>
<td>0 0 0</td>
</tr>
<tr>
<td>(3) Occasionally Engaged</td>
<td></td>
<td>0 3 0</td>
<td>0</td>
<td>0 0 0</td>
</tr>
<tr>
<td>(4) Rarely Engaged</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
in the level of consistent engagement in academic work, the manner in which variability was distributed across specific students and different skill levels, the teacher's reactions to changes in the level of engagement, and so on. Thus, findings relative to the nature of students' engagement in academic work led to the identification of a second, but interrelated set of research questions: Question 3.2.2, What is the nature of students' efforts to modify the stated movement task?, and Question 3.2.3, What is the nature of the teacher's response to students efforts at task modification? (i.e., A student was considered to have modified the teacher stated major movement task during a Movement Task Unit if she/he was coded as mostly, partially or Rarely Engaged in the practice of that task). To answer these Research Questions it was necessary to look within the level of the Movement Task Unit. Given the interrelatedness of these questions, the findings are reported in an integrated fashion.

**Question 3.2.2 and 3.2.3: Analytic Process**

The questions in this section examine student modification of academic work and the manner in which the teacher deals with change in the stated work expectations. Data for exploration of patterns of student efforts at modification of the major movement task, that is, at not being consistently engaged in practice, and teacher response to these efforts were obtained via the repeated observation of the actions and interactions of students across time during the Movement Task Unit. Points of reentry into the Movement Task Unit to conduct
the observation were provided by data obtained to answer other research questions. Identified below, these data, became points of hypothesis generation and testing within the Movement Task Unit to provide information regarding what was occurring with respect to students' attempts to modify task. These points of reentry permitted qualitative examination of factors that contributed to task modification.

As indicated in Chapter III, two primary sources of data provided points of reentry into the data. The first and primary source of data that informed the findings for this section was the Student Engagement Profile. Table 30 provides an illustrative example of the Engagement Profile for four students. The Student Engagement Profile provided a record of those students who modified the teacher stated academic movement task as a result of not being consistently engaged during practice for the 71 movement tasks in the ten lessons sampled. This record of task modification for each student permitted qualitative examination of factors that contributed to task modification.

The second major source of data was obtained from microanalysis of the instructional conversation. Two primary types of data provided points of reentry. First, microanalysis of the instructional conversation during the Task Presentation Phase of the Movement Task Unit (Section 3.1) permitted the identification of a pattern of teacher communication - teacher restatement of the immediately preceding movement task. As discussed in the findings
### Table 30

**Student Engagement Profile**

<table>
<thead>
<tr>
<th></th>
<th>Lesson 1</th>
<th>Lesson 2</th>
<th>Lesson 3</th>
<th>Lesson 4</th>
<th>Lesson 5</th>
<th>Lesson 6</th>
<th>Lesson 7</th>
<th>Lesson 8</th>
<th>Lesson 9</th>
<th>Lesson 10</th>
<th>Lesson 11</th>
<th>Lesson 12</th>
<th>Lesson 13</th>
<th>Lesson 14</th>
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<tbody>
<tr>
<td></td>
<td>Phase Unit</td>
<td>Phase Unit</td>
<td>Phase Unit</td>
<td>Phase Unit</td>
<td>Phase Unit</td>
<td>Phase Unit</td>
<td>Phase Unit</td>
<td>Phase Unit</td>
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<td>Phase Unit</td>
<td>Phase Unit</td>
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<td>Phase Unit</td>
<td></td>
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<td>6</td>
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<td>8</td>
<td>9</td>
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<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>MTU</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
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<td>13</td>
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</tr>
<tr>
<td>Brenda</td>
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<tr>
<td>Keely</td>
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<tr>
<td>Jeff</td>
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<td>3</td>
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<td>3</td>
</tr>
<tr>
<td>Ronnie</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>3</td>
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<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

**Legend**
- * Consistently Engaged
- # Non-Consistently Engaged
- 2 Mostly Engaged
- 3 Partially Engaged
- 4 Rarely Engaged
- * Mostly, Partially, or Rarely Engaged
for Section 3.1, this strategy was sometimes linked to students' modification of task. Second, analysis of the instructional conversation during the Practice Phase of the Movement Task Unit (Research Question 3.2.4 presented later in this chapter) permitted the extraction of a pattern of feedback associated with students' attempts to modify work expectations: feedback in which the teacher individualized movement tasks. This pattern was also associated with student attempts to modify academic work.

The Student Engagement Profile and the two preceding sources of data thus provided points of hypothesis generation and testing concerning students' conduct of academic work within the Movement Task Unit. By tracing students' actions and interactions across time it was possible to observe instances of engagement and nonengagement as well as patterns of change in engagement. In so doing, factors that influenced a students' engagement in academic work were identified (e.g., shift in partner, teacher intervention).

**Question 3.2.2 and 3.2.3: Patterns of Student Modification of Task and Teacher Responses**

The findings in this section indicate that modification of the stated academic movement task, and thus variability in the level of consistent student engagement in task, were a function of four factors, and the interrelationships between and among these four factors:
a) the individual student,
b) the peer group,
c) the teacher, and
d) the academic movement task.

Illustrative findings relative to each of these four major sources of influence on students' consistent engagement in academic work are presented below in the form of individual case studies.

The Individual Student as a Reason for Variability in Work Engagement

The present set of findings is presented in the form of a case description of a student during participation in physical activity. Given the shifting nature of information obtained during observation, the findings are presented in narrative form. The findings are representative of a pattern of interaction of a small number of students (n=4) who were unwilling to engage consistently in the stated academic work expectations.

The findings describe a low skilled, overweight male student named Jeff. The Student Engagement Profile for Jeff (see Table 30) indicates that during Lessons 1, 2, and 5 (i.e., Jeff was absent for the third lesson and moved out of the school district after the fifth) Jeff modified the movement task in 75% of the tasks (i.e., 24 out of 32). The Profile also shows that for 19 out of the 20 (95%) tasks for which the Category 2, 3, & 4 engagement coding was available, Jeff was coded as partially or rarely engaged. Table 31
Table 31

Sample of Field Notes Describing Jeff’s Actions During Physical Activity

<table>
<thead>
<tr>
<th>Lesson</th>
<th>Phase Unit</th>
<th>MTU</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
<td>5</td>
<td>- wasting time standing and watching other students</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- twirling ball on finger tips/ dribbling ball on floor</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- talking to another student</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- throwing ball against wall/ batting ball against wall with one hand</td>
</tr>
</tbody>
</table>
provides a portion of the field notes describing Jeff's actions/behavior whenever he modified academic work. These qualitative data indicate that Jeff demonstrated a range of actions that communicated unwillingness to cooperate in the academic work of lesson.

A return to the structural maps of the instructional conversation in Lessons 1 and 2, as well as to the videotaped records of these lessons, indicated that Jeff was generally left alone by the teacher during the Practice Phase of Movement Task Units. Jeff's self-selected playing space near the wall in a corner of the gym was rarely the target of monitoring or invasion by the teacher.

There are, however, two exceptions to this general pattern of nonintervention by the teacher. The data in Table 32 indicate that twice in Lesson 2 during successive Movement Task Units in which Jeff was rarely and partially engaged in work, the teacher issued a warning to Jeff. The warning was that Jeff was expected to work on the stated movement tasks. Immediately after the warning was given, in both instances, the teacher moved away from Jeff without observing what, if any, impact her feedback had. Also, in both instances, soon after the warning was given the teacher blew her whistle and ended the practice period. Thus, it was difficult to identify what effect, if any, the teacher's intervention had on Jeff's engagement in work as well as the teacher's reactions to Jeff's engagement. The Student Engagement Profile (Table 30) does reveal, however, that Jeff's engagement rankings were higher for the two Movement Task Units after those in which the warnings were issued.
Table 32

Two Warnings Issued to Jeff Regarding Inappropriate Engagement

<table>
<thead>
<tr>
<th>Lesson</th>
<th>Phase Unit</th>
<th>Movement Task Unit</th>
<th>Message Unit</th>
<th>Transcription</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>3</td>
<td>3</td>
<td>272-279</td>
<td>Tchr: MOVE AND GET THERE JEFF. I WANNA SEE YOU WORKING. I WANNA SEE YOU WORK.</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td></td>
<td>365-374</td>
<td>Tchr: JEFF. WHAT DID I ASK YOU TO WORK ON HONEY? (S RESPONDS - INAUDIBLE Okay. DID I ASK YOU TO WORK AGAINST THE WALL RONNIE? DID I ASK YOU TO WORK AGAINST THE WALL? I ASKED YOU TO PASS INTO THE AIR ON YOUR OWN. NOT AGAINST THE WALL, OKAY?</td>
</tr>
</tbody>
</table>
During Movement Task Unit 2 Jeff returned to his pattern of general unwillingness to participate in task and continued to be only partially engaged (Category 3) in all the remaining Movement Task Units during lesson but one. There was no other interaction between the teacher and Jeff for the rest of the lesson. The videotaped record also revealed that Jeff's minimal engagement in the stated movement task was carried out in the corner of the gym without Jeff being disruptive to the class in general.

The systematic process of detailed observation within the Movement Task Unit described above permitted the identification of a recurring pattern of interaction in which some students were not willing participants in the academic work of lesson. Though not a frequently occurring pattern, it was one factor influencing the level of consistent work engagement in this physical education class. This pattern highlighted the role of the individual student in determining the nature of his/her engagement in academic work.

The Peer Group as a Reason for Variability in Work Engagement

The present set of findings, like those that preceded, is reported in the form of a case description. Systematic observation of students during the Practice Phase of the Movement Task Unit revealed that who students chose to participate or work with influenced their level of engagement in academic work and, in some cases, the local motor skill outcomes of practice. The findings presented below briefly describe two distinctly different patterns of interaction for a quiet, somewhat withdrawn student named Ronnie.
The contrast in the two patterns is illustrative of that for at least ten other students in the class. The contrast in these patterns of interaction served to highlight the role of the peer group in influencing student engagement in academic work.

The patterns were made visible by the Student Engagement Profile (Table 30). This Engagement Profile provided a record of Ronnie's engagement in the major movement task for Lessons 1, 2, 3, 5, 7, 8, 9, 11, 12, and 14. Examination of this Profile reveals that there was considerable variability in the level of Ronnie's engagement in academic work during lessons 1, 2, and 5 and lessons 7, 8, 12, and 14 (In Lesson 3 Ronnie was not on the side of the court in which the observation was conducted.) This record provided a point of reentry into the data to obtain information about the nature of students' efforts to modify academic and thus to determine possible reasons for the variability in engagement in student work.

Observation of the videotaped record during the Movement Task Unit for Lessons 1 and 2 showed that Ronnie had a playing space in the corner of the gym next to Jeff (i.e., the target student in the first set of findings). At times during these lessons the stated work expectations called for students to work independently of one another (e.g., "Work on the overhead pass to self"). During practice Ronnie and Jeff frequently interacted with one another in some manner (e.g., interfered with the other's volleyball during the self pass, kicked the other person's volleyball away, talked with one another, etc.). On several occasions Jeff entered Ronnie's work space and initiated the interaction.
In addition to the academic work conducted "independently" of others during these lessons, the stated work expectations also required students to work with others. On each occasion that called for students to work in pairs Ronnie and Jeff elected to be partners (i.e., The findings in Section 2.1 relative to the normative requirements for student action indicated that the responsibility for selecting persons with whom to work was the responsibility of the student).

The product of the interaction between Ronnie and Jeff, whether they were working alone or in partners, was that in 62% (15 of 24) of the Movement Task Units during Lessons 1 and 2 (See Table 30) Ronnie failed to be consistently engaged in academic work (i.e., Jeff's poor engagement record has already been established in the set of findings preceding the present findings). In 80% (12 out of 15) of the Movement Task Units Ronnie was only partially or rarely engaged in academic work. In each instance, Ronnie appeared to be influenced by Jeff in some way. The same pattern of interaction was also present in the macro-observation conducted in Lesson 5 (See Table 30).

Examination of Ronnie's Student Engagement Profile for Lessons 7, 8, 12 and 14 indicated, however, a different pattern of interaction. Specifically, the Profile revealed that Ronnie became consistently engaged in academic work during those lessons. Observation within the Movement Task Units of the latter four lessons revealed that Ronnie worked in playing units during those lessons with students other than Jeff. The class attendance record also revealed that Jeff had moved out of the school district and thus
was no longer a student in the physical education class being studied. The fact that the change in Ronnie's level of engagement co-varied with Jeff's departure from the class provided additional evidence that Ronnie's level of engagement was influenced by Jeff. In fact, the data indicate that peer influence was sufficiently great in this case that Ronnie, a student who normally was a willing participant in academic work (i.e., as evidenced by the engagement record in Lessons 7, 8, 12 and 14), refused to participate in the academic work of lesson.

The case description that preceded is representative of a larger series of findings that focused on the role of a student's immediate peer group in negatively (as well as positively) influencing consistent engagement in the stated movement task work expectations. The contrast in two patterns of student action, such as discussed in the case of Ronnie, allowed identification of the peer group as a factor influencing engagement. In cases where the peer group constrained, rather than supported, consistent engagement in work, the class as the macro or whole peer group appeared to have less influence over the individual student engagement than did the smaller playing group to which the student belonged. That is, the playing unit had its own norms for an acceptable level of engagement in practice of the major movement task. Observation of the videotaped record of students' actions, and field notes made during Step 1 of the construction of data for exploration of pattern of student engagement (i.e., Section 3.1.1), suggested that these norms were established by one or more of the dominant individuals within
the group. Normative conduct appeared to be established via an implicit process of these individuals demonstrating "how we're going to act" rather than an explicit process, or a formal statement, of "this is what we're going to do/how we're going to act".

Thus, observation within the Movement Task Unit permitted the identification of the playing unit as a vital dimension of the total physical education class. When a dramatic change in the level of engagement co-varied with a change in playing partner(s), this point of contrast led to the identification of the peer group as one cause of variability in students' consistent engagement in work.

The Teacher as a Reason for Variability in Work Engagement

The findings in this section are also presented in the form of a case description. The findings were made visible as a result of triangulation of findings from Section 3.1, task presentation, and 3.2.1, student engagement in academic work. The process of bringing multiple sources of information together led to a process of hypothesis-generation and hypothesis-testing within and across Movement Task Units. This process helped to make explicit one reason for variability in the level of consistent engagement in work in the physical education class - lack of teacher clarity in presentation of work expectations (See Sections 3.1 and 3.2 for a full discussion of the triangulated findings.)

The findings below explore, via a single case, one recurring pattern of interaction in which there was lack of clarity in presentation of the academic work expectations by the teacher. The
findings also highlight a recurring pattern of interaction that showed the teacher's attempts to maintain the stated movement task. The pattern of teacher restatement of task showed the teacher's efforts to get students appropriately engaged in academic work after they had modified (i.e., were mostly, rarely, partially engaged in) the stated movement task practice expectations.

The findings in this section highlight instances where there was failure to establish a shared frame of reference between teacher and students regarding the expectations for practice of the academic movement task. While the pattern of teacher interaction in which there was a lack of clarity in communicating expectations, and the ensuing pattern of teacher restatement of task, were low occurring patterns in the physical education class, they were one source of variability in the level of students' consistent engagement in academic work. The case description below provides a description of the actions and interactions of students and teacher during both the Task Presentation Phases and Student Practice Phase of a Movement Task Unit in Lesson 1 (i.e., Phase Unit 5, Movement Task Unit 1) in which the level of consistent engagement in academic work was low (i.e., 59%).

Table 33 presents the portion of the map that includes the Task Presentation Phase for Movement Task Unit 1. Message Unit 315 in the Task Presentation Phase indicates that the teacher stated that students were to pass the ball to self using the overhead pass. When the teacher demonstrated the movement task to students, however, she pushed the ball into the air from the overhead pass position above
Table 33

Portion of Task Presentation Phase for Movement Task Unit One

<table>
<thead>
<tr>
<th>Message Unit</th>
<th>Transcript</th>
</tr>
</thead>
<tbody>
<tr>
<td>310</td>
<td>NOW WHAT I’M GONNA ASK YOU TO DO</td>
</tr>
<tr>
<td>311</td>
<td>IN JUST A SECOND</td>
</tr>
<tr>
<td>312</td>
<td>IS TO STAND UP</td>
</tr>
<tr>
<td>313</td>
<td>TAKE THE BALL IN THIS POSITION</td>
</tr>
<tr>
<td>314</td>
<td>(T demonstrates overhead pass position)</td>
</tr>
<tr>
<td>315</td>
<td>AND SIMPLY</td>
</tr>
<tr>
<td>316</td>
<td>PASS IT INTO THE AIR</td>
</tr>
<tr>
<td>317</td>
<td>AND CATCH IT IN THAT POSITION</td>
</tr>
<tr>
<td>318</td>
<td>(T pushes ball into air and catches ball)</td>
</tr>
</tbody>
</table>
her forehead. That is, she simulated the passing action by pushing rather than actually striking or passing the ball. The teacher performed this action four times total.

The teacher, then, delivered two diametrically opposing messages regarding work expectations. The meaning each student in the class constructed, therefore, was a product of the manner in which he/she processed these conflicting cues. Thus, the videotaped record provided evidence of a potential source of confusion for students in identifying what the expectations were for practice. The conditions were "right", therefore, for modification of the academic movement task (i.e., the intended movement task).

The videotaped record indicated that a shared frame of reference was not established regarding the type of academic work expectations. What the teacher intended to deliver did not correspond to the meaning constructed by approximately half the students in the class (i.e., Teacher intentions were revealed via continued observation of the actions and behavior of the teacher. Observations revealed that the teacher attempted to reestablish the pushing action, rather than the passing, as the intended action or focus of the task). Table 34 shows that the initial engagement (See Section 3.1 for a discussion of initial engagement) of 11 students out of 32 observed (34%) during lesson 1, Phase Unit 5, Movement Task Unit 1 did not conform to the intended work expectations pushing the ball. The videotaped record showed that these students passed, rather than pushed, the ball. When the level of consistent task engagement was examined, the data in Table 34 indicated that 41% (13 out of 32) of the students were
Table 34

Record of Student Engagement in the Student Practice Phase of Lesson

Phase Unit 5, Movement Task Unit 5

<table>
<thead>
<tr>
<th>Number of Students Observed</th>
<th>Number and Percent Appropriately Engaged Initially</th>
<th>Number and Percent Not Consistently Engaged in Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>11 (34%)</td>
<td>13 (41%)</td>
</tr>
</tbody>
</table>
not consistently engaged during the time given for practice of the task. That is, 41% of the students failed to engage in what the teacher intended as movement task work requirements. Meaning constructed by these students appeared to be based on what was delivered verbally by the teacher in one message unit rather than nonverbally (i.e., visually) during four demonstration trials. What these 11 students heard, therefore, had more significance than what they saw. The findings for this case description indicate one factor associated with variability in the level of students' engagement in academic work - inconsistency in the nature of the substantive messages delivered by the teacher during the Task Presentation Phase of the Movement Task Unit. Teacher inconsistency was one of three reasons for lack of clarity about stated work expectation (i.e., See Section 3.1 for a full discussion of reasons for lack of clarity).

Testing for Shared Meaning: The Effectiveness of the Strategy of Task Restatement

Included in the triangulated findings from Research Question 3.1 was the pattern of "Task Restatement" in the Movement Task Units subsequent to those Units in which there was a lack of clarity in the teacher's presentation of the work requirements. To determine the effectiveness of this pattern as an instructional strategy for re-establishing the existence of shared meaning in the class, findings from Section 3.2.1 on student engagement were examined. The data in Table 35 indicate that this strategy was successful in helping to resolve a frame clash during Movement Task Units in which academic work expectations had not been made clear by the teacher.
Table 35

Percent of Students Consistently Engaged in Academic Work in Three Movement Task Units Where the Conditions of Lack of Clarity/Restatement of Task Were Present

<table>
<thead>
<tr>
<th>Lesson</th>
<th>PU</th>
<th>MTU</th>
<th>Percent</th>
<th>Lack of Clarity</th>
<th>Restatement of Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>1</td>
<td>59</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td>78</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td>81</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>2</td>
<td>67</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td>73</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td></td>
<td>73</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td>83</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>
during the three Task Presentation Phases. Table 35 shows the percentage of students consistently engaged in academic work during the Practice Phase of three such Movement Task Units (i.e., Lesson 1, Phase Unit 5, Movement Task Unit 1; Lesson 2, Phase Unit 3, Movement Task Unit 2; Lesson 2, Phase Unit 4, Movement Task Unit 3). The data in Table 35 indicate that the level of consistent engagement improved (e.g., from 59% in Lesson 1, Movement Task Unit 1 to 78% in Movement Task Unit 2) in the Practice Phase of the subsequent Movement Task Unit in which the major movement task was restated. The teacher's strategy, then, of interrupting the flow of instructional activity to restate academic work expectations, when large numbers of students were inappropriately engaged in work, led to increased participation in all of the instances of intervention in the Movement Task Units analyzed.

The Academic Movement Task as a Reason for Variability in Work Engagement

Understanding the reason for students' modification of the primary academic work of lesson required consideration of the context in which movement task practice was grounded. Understanding the context of task practice likewise required consideration of academic performance. That is, how well did the student do? What were the outcomes of performance? Did these outcomes influence subsequent engagement in practice and in what ways? The findings in this section are presented in the form of a case description of two highly skilled students who, apparently dissatisfied in the early lessons in the unit with the level of challenge of the academic movement tasks,
worked to change those tasks to more difficult or challenging ones. This pattern frequently occurred for these and at least three other highly skilled students in the class during Lessons 1, 2, and 3. Two of these five students were also part of the sample of target students that was systematically selected for the analysis of skill response. Findings presented later in this chapter in Section 3.2.5 show that these two students were very successful performers for whom the major movement tasks presented little difficulty.

The Student Engagement Profile (Table 30) shows that the level of engagement in the academic movement task for Brenda and Keely, two of the highly skilled students, was particularly poor in Lessons 1 and 2. These lessons had the least complex tasks (see Section 1.4, in this chapter for rankings of task difficulty). Specifically, Brenda was not consistently engaged in 67% (16 out of 24) of the Movement Task Units for these two lessons. Keely, who worked near Brenda and/or as her partner, was similarly coded as mostly, partially, or rarely engaged in 71% (17 out of 24) of the Movement Task Units across these lessons. Triangulating these data with qualitative data helped to contextualize these measures of engagement. The process of coding a student's level of engagement in the academic movement task included taking descriptive, qualitative notes about what the student did during practice (e.g., what the student did at points of transition when playing with a partner; how much effort the student seemed to be putting into his/her practice, etc.). A sample of these notes is presented in Table 36. These
**Table 36**

**Sample of Descriptive Notes Taken During Process of Coding Students' Engagement in the Academic Movement Task**

<table>
<thead>
<tr>
<th>Lesson</th>
<th>Phase</th>
<th>Movement Unit</th>
<th>Task Unit</th>
<th>Student</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>3</td>
<td>Brenda, Keely</td>
<td>Ss pass continuously to self instead of push/catch; appear not interested; pass ball as high as possible.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Brenda, Keely</td>
<td>Playing around; talking to each other.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Brenda, Keely</td>
<td>Playing around; acting silly; doing ballet steps.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Brenda, Keely</td>
<td>Alternate push/catch with pass to self; trying to challenge each other to keep ball going.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
notes suggest that Brenda and Keely were somewhat less than enthusiastic about practice of the stated academic movement tasks.

The notes also suggested, and a return to the videotaped records confirmed, that one frequent way Brenda and Keely modified the student major movement tasks was by extending (Rink, 1979) them in some way (i.e., making the task more difficult/challenging). For example, instead of performing the teacher designated "push-catch" task, each of these students passed continuously to self; Instead of "toss and partner pass back", Brenda and Keely partner passed. Thus, the data showed that while these students did modify the stated task, the efforts at task modification frequently consisted of practice of a more challenging movement task rather than simply a failure to practice.

The triangulation of findings from Section 3.2.4 (i.e., patterns of interaction during practice) provided information that increased understanding of these students' modifications of the stated work requirements. The identification of one recurring pattern of interaction between teacher and students during the Practice Phase of the Movement Task Unit, "Student Initiates Question About Performance", provided a point of reentry into the Movement Task Unit that provided additional evidence regarding task modification (See Section 3.1 for a full discussion of this pattern).

During the Practice Phase of Movement Task Unit 1 in Phase Unit 6, Lesson 1, Keely asked the teacher if she and Brenda could change the major movement task so that they could work together to pass the ball (i.e., partner passing was a more complex task) rather than
practice the overhead pass to self. Observation of the videotaped record showed that prior to this attempt to negotiate an upwards extension of the task, Keely and Brenda had not been consistently engaged in practice of the major movement task. They were talking to one another, twirling the volleyball on the fingertips, and generally wasting time. The teacher responded with "No. We'll do that later". The teacher's negative reply to Keely's request for a more challenging task suggested that the teacher intended to maintain the stated movement task regardless of these students' apparent dissatisfaction with the nature of their academic work.

Examination of the videotaped record showed that Brenda and Keely basically ignored the teacher's verbal refusal to allow practice of tasks other than the stated tasks. In the next two Movement Task Units, they did not engage in the teacher stated movement task at all. Instead, they changed the task completely to a more challenging activity — continuous partner passing (The Student Engagement Profile in Table 30 shows that Brenda and Keely were coded as rarely engaged in practice of the stated task during these last two tasks of Lesson 1). No attempt was made by the teacher to get these students appropriately engaged in work. The teacher either observed the students' change of task and chose not to respond in any overt manner or she failed to observe the students' actions. This pattern of reaction to inappropriate engagement in work changed in Lesson 2, however.

This change was revealed via the triangulation of findings regarding patterns of interaction during the Practice Phase of the
Movement Task Unit (See Section 3.2.4 in this chapter for a full discussion of these patterns). One pattern, "Teacher Sanctions Change in Movement Task/Individualizes Movement Task", provided a point of reentry into the data. Table 37 shows that during the Practice Phase of Movement Task Unit 2, Phase Unit 4, Lesson 2, the teacher stopped Brenda and Keely during the Practice Phase and verbally sanctioned (positively) their change in movement task. Observation of the videotaped record showed that Brenda and Keely changed the stated task by passing the ball back and forth continuously instead of practicing the the teacher stated "toss and partner pass back" task and Table 37 shows that the teacher gave her approval of this student - determined change. This sanctioning of Brenda and Keely's change in task occurred one additional time in Lesson 2.

Thus, these students were successful in getting the more challenging academic work that was on their agenda recognized by the teacher as legitimate academic work in the class. Findings presented later in this chapter in Section 3.2.4 also show that in Lesson 3 and subsequent lessons there was a recurrent pattern of teacher individualization of movement tasks for these highly skilled students (i.e., nine occurrences across 14 lessons). The pattern was a proactive" recognition (i.e., though possibly the result of students' past attempts to obtain more challenging work) of the need for differentiated academic work for students because the teacher initiated the upwards extension of the academic task rather than sanctioned a student change in task). Given these more challenging
Table 37

**Teacher Positively Sanctions Student Change in Academic Work**

<table>
<thead>
<tr>
<th>Lesson</th>
<th>Phase Unit</th>
<th>Movement Task Unit</th>
<th>Message Unit</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>4</td>
<td>2</td>
<td>563</td>
<td>OKAY HOLD UP OKAY YOU ALL CHANGED WHAT I ASKED YOU TO DO, BUT THAT'S OKAY We already did that I KNOW I WANT THREE AND SWITCH THREE AND SWITCH AND KEEP GOING. THAT'S MY FAULT. TELL YOU WHAT. I YOU TO KEEP WITH THIS CONTINUOUS PASSING BUT I WANT TO SEE YOU MOVING.</td>
</tr>
</tbody>
</table>
tasks, Brenda and Keely participated appropriately in the academic work of lesson (i.e., The Student Engagement Profile in Table 30 shows that the level of these students' engagement in work improved after Lesson 3.

The findings above showed that one cause of variability in the level of students' engagement in academic work was the nature of the academic movement task. The appropriateness of the task with respect to students' motor skill ability level was a factor influencing the level of work engagement for at least five highly skilled students in this physical education class. These findings complete those for Research Question 3.2.2 and 3.2.3

Question 3.2.4: Analytic Process

The findings in this section explore categories of information presented by the teacher during the Student Practice/Teacher Interaction Phase of the Movement Task Unit. Some of the categories, though not all, have been alluded to or stated in other sections of this chapter. This redundancy is due to close linkages between what got talked about when students were not involved in practice and why they were involved in practice.

Data for exploration of patterns of information communicated by the teacher during the Practice Phase of the Movement Task Unit were obtained from the structural maps and videotaped records using a series of three data construction and analysis steps. Step 1 involved writing a systematic description on an interactive
episode-by-interactive episode basis (i.e., An explanation of the interactive episode was given in Appendix A) of the information communicated during the Practice Phase of the Movement Task Unit in Lessons 1, 2, 8, and 12. This led to the analysis of patterns of information communicated by the teacher in Step 2.

In Step 2, the search for and analysis of recurring patterns of information led to the extraction of seven categories of information communicated by the teacher during interactive episodes in the Practice Phase of Movement Task Units.

Step 3 involved using the seven categories of information to code each interactive episode in the Practice Phase of all Movement Task Units in Lesson 1, 2, 8 and 12. Thus, each interactive episode in the four lessons was coded according to one or more of the seven categories - depending upon the type of information contained in the episode.

Question 3.2.4: Patterns of Information Communicated During Practice

Figure 14 shows, and the presentation of findings below supports, that the nature of the information communicated by the teacher during the Practice Phase of the Movement Task Unit was both social and academic in nature (i.e., See Section 2.1). Because the theoretical framework undergirding this study assumes that the academic structure of lessons is embedded in the social structure, presented first are categories of information that were placed under the social rubric. These findings help to provide a framework for interpreting findings related to the academic dimension. Categories within both the social
<table>
<thead>
<tr>
<th>SOCIAL</th>
<th>ACADEMIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Engagement in Work (N=16/9%)</td>
<td>Rapid Fire, Task Drive Feedback (n=93/49%)</td>
</tr>
<tr>
<td>Organizational Structure of the Movement Task (n=12/6%)</td>
<td>Individual Performance Drive Feedback (n=35/19%)</td>
</tr>
<tr>
<td></td>
<td>Applied Task Feedback (n=17/9%)</td>
</tr>
<tr>
<td></td>
<td>Providing Clarification About Academic Work (n=8/4%)</td>
</tr>
<tr>
<td></td>
<td>Individualization of the Movement Task (n=7/4%)</td>
</tr>
</tbody>
</table>

n = number of interactive episodes in which the category of information was observed (N=188 episodes)

**Figure 15.** Categories of verbal information presented during student practice/teacher interaction phases of movement task units in five lessons.
and academic framework are presented in the order of the frequency with which each occurred during the interactive episodes of the Practice Phase of the Movement Task Units across the fourteen lessons.

**The Social Dimension**

The two categories of social information presented below are tied to two normative expectations for conduct in the physical education class (See Section 2.1 for clarification of the manner in which information presented during practice is related to normative expectations for behavior).

**Student Engagement in Work**

In nine percent of the interactive episodes (i.e., 16 of 188) the teacher responded to what her actions indicated she perceived as inappropriate engagement in the academic work of lesson. These interactive episodes appeared on the structural map as Potentially Divergent Units during the Practice Phase. These episodes occurred in response to a breach (or perceived breach) in the expectations for student conduct (e.g., "John, aren't you supposed to be working?"; "You're supposed to be passing to yourself - not to a partner."). Observation of the videotaped record revealed that in 85% (38 out of 42) of the cases of potential divergence, there was indeed a breach in the normative requirements. In four of the cases the teacher incorrectly assumed there was a breach. The cues the teacher had available to her apparently led to an incorrect evaluation of those students' engagement in academic work.
Organizational Structure of the Movement Task

Six percent of the interactive episodes (i.e., 12 of 188) highlighted a recurring pattern of interaction in which information was given by the teacher about the organizational structure of the movement task (See Section 1.1 and 3.1 for a discussion of this "managerial task"). These episodes frequently occurred at the beginning of the Practice Phase and were primarily though not exclusively, initiated by students. Episodes initiated by students were, in each instance, a request for assistance in carrying out the expectations of the organizational task. These episodes, therefore, were primarily attempts to "fix" parts of the organizational structure that were not "in place" (e.g., There were too many people in a group; A student didn't have a partner; There was not sufficient room to practice.). Rarely did the teacher intervene in the performance of this task without being "invited". It was basically, then, the responsibility of the student to seek assistance if needed. Once individual problems regarding the organizational structure were "fixed" at the beginning of the Practice Phase, this category did not reappear during the rest of the Practice Phase. Thus, managerial problems brought to the attention of the teacher in the first part of the Practice Phase were dealt with on an individual basis without interruption of practice by the main of the class.
The Academic Dimension

Rapid Fire, Task Driven Feedback

In forty-nine percent of the interactive episodes (i.e., 93 of 188) the teacher gave student(s) predominantly quick, short bursts of information (i.e., information or feedback that did not require a him/her to stop practice) relative to motor skill performance. This category was one of two categories that directly provided students information about their ongoing motor skill performance. The characteristics or elements that defined the "Rapid Fire, Task Driven Feedback" are shown in Figure 16.

In each instance, the "Rapid Fire Feedback" was specific in nature (i.e., It identified a definite aspect of performance for the student), and in each instance that specific focus was congruent with the performance expectations identified by the teacher in the Task Presentation Phase. The data show, therefore, that as a result of this congruency, a clear link or bond existed between stated expectations and what got recognized or counted as work. This information was delivered both publicly to the class and "privately" to individuals within the class. A final characteristic of this category of information was that the feedback functioned as: a) an "affirming" statement that told a student he/she had demonstrated well one or more of the stated critical performance elements (e.g., "You moved really well that time."); "Real good extension of the legs"), or b) as a "Do it" statement that told students to work on either the major movement task (e.g., "Everyone should be partner passing now."), or c) as one or more of the stated critical
Figure 16. Taxonomy of characteristics of "Rapid Fire, Task Driven Feedback" given during the practice phase of the movement task unit.
performance elements (e.g., "I want to see those legs bend and extend this time."); "Move quickly, move quickly."). Feedback in this category of information was "driven" by the stated movement task.

Given that this was the dominant category (i.e., in terms of frequency of occurrence in the physical education class), it is explored in greater depth later in this section.

**Individualized Performance Driven Feedback**

In nineteen percent of the interactive episodes (i.e., 35 of 188) the teacher gave individualized motor skill feedback to a student in the class. This category was the second that provided students information about their ongoing motor skill performance. The information in this category was "individualized" because this feedback was driven more by the student's immediately preceding motoric performance than by the expectations of the stated task. This information was specific feedback that was noncongruent with the stated task and that was corrective in nature (i.e., it had the goal of improving performance). Though no formal data were collected to provide evidence, observation of the videotaped records of the actions and interactions of participants during these episodes suggested that information communicated via this category was more likely, in comparison to the preceding category, to be based upon a longer period of observation by the teacher and/or a pattern of observe, give feedback, observe, give feedback, and so on.

The discussion thus far has highlighted two categories of information that directly provided students information about their
motor skill performance. The first category of information was "task driven" while the second was "student performance driven".

**Applied Task Feedback**

In nine percent of the interactive episodes (i.e., 17 of 188) the teacher gave information related to the performance of academic movement tasks that were applied (Rink, 1979) in nature, that is, tasks that were competitive or self-testing. Typical of information in this category were messages about keeping score, hustle, rules of play, giving it "your best shot", "try to do better during the next trial", and so on. This category of information, in comparison to the two preceding categories, was indirectly rather than directly related to students' motor skill performance.

**Student Seeking Information About Academic Work**

In four percent of the interactive episodes (i.e., 8 of 188) the student requested and the teacher provided information about the practice of the academic movement task. These questions were of two general types. The first was an attempt by the student to seek clarification of information communicated earlier by the teacher about practice of the movement task (e.g., "What do you mean by pads of the fingers?"; "Are we supposed to pass continuously or with a partner?"). The second type of question was an attempt to negotiate an upwards extension of the movement task (e.g., "Can we pass to each other [instead of toss and pass]?"; "Are we goin a play a game soon?"). In each instance the student attempting to negotiate the
upwards extension was a highly skilled student. Also in each instance, the teacher denied the student's request.

**Individualization of the Movement Task**

In four percent of the interactive episodes (i.e., 7 of 188), the teacher provided information to a playing unit regarding changes in the stated movement task. That is, the teacher gave the playing unit a movement task that was different from what had originally been designated during the Task Presentation Phase as the focus for practice. This change in task was grounded in one of two sets of conditions. One condition that precipitated change occurred when problems with the organizational structure were not resolved by students and/or teacher (e.g., a student did not have a partner; there was an odd number of people in the group). Failure to resolve the organizational structure in which academic task practice was embedded resulted in the teacher changing the task itself (i.e., all changes in task were within the taxonomy of major movement tasks identified in Section 1.4). Changes in task due to organizational problems occurred **across** skill levels. The change in task in the second condition occurred **within** skill level.

The second condition under which change in task occurred was tied to efforts by five or more highly skilled students to extend the major movement task (i.e., triangulated findings in Section 3.2.2/3.2.3 showed that these students were dissatisfied with the level of challenge of academic work). Within this major condition there were two subconditions under which task individualization
occurred. One was when the students changed the task on their own — without direction from the teacher — and the teacher observed this change and sanctioned it. In essence, the message she gave students was "I know you changed what I asked you to do but it's okay — go ahead with what you're doing". The second subcondition of individualization of task was a "teacher-directed" change. That is, the teacher "proactively" designated a different task for these highly skilled students at the start of the Practice Phase.

Observation of the actions and interactions of participants across time indicated, however, that these occurrences of "teacher-directed" individualization of academic work were embedded in the history of student-directed changes in practice.

The findings above highlighted seven basic social and academic categories of information presented by the teacher during the Student Practice/Teacher Interaction Phase of Movement Task Units in the four theoretically selected lessons (See Figure 14 for a summary of these categories). The identification of these seven categories provided a basic understanding of the manner in which teacher interaction during practice was related to the conduct of academic work in the physical education class.

To increase understanding beyond that provided by the categories above, it was necessary to examine more directly the relationship between student performance and the information communicated. This relationship was examined via the primary category of information communicated during practice, the "Rapid Fire, Task Driven Feedback" category. Given that this major category of information was directly
related to students' motor skill performance, additional analysis was conducted to help increase understanding of the manner which the information functioned in relation to performance.

An Indepth Examination of the Primary Category of Information

Data for further exploration of the "Rapid Fire, Task Driven Feedback" category of information were obtained by coding each of the ninety-three occurrences of the "Rapid Fire" feedback in the four lessons according to one a priori determined and two inductively derived descriptive categories (See Figure 17) (See Chapter III for a full discussion of the procedures for coding).

Analysis

Function of the feedback. Each occurrence of "Rapid Fire" feedback (n=93) was coded according to the manner in which the feedback functioned during the interactive episode. Findings reported earlier indicated this category of information had two functions:

- Affirming function;
- Do it! function.

Congruency of the feedback with stated task. Each occurrence of "Rapid Fire" feedback (n=93) was coded according to whether the source of congruency with the stated task was a reference to one or both of the following (i.e., congruency was also an inductively derived characteristic):

- Major Movement Task;
- Critical Performance Elements.
Figure 17. An examination of the primary category of information presented during practice according to five descriptors.
Target of the feedback. Each occurrence of the "Rapid Fire" feedback (n=93) was coded according to whom the feedback was directed (i.e., the target of the feedback):

- Individual (I);
- Individual/Public (I/P);
- Group (G);
- Class (C).

Data were also obtained by coding each occurrence (n=49) of the "Rapid Fire" feedback that 1) had an affirming function (i.e., feedback that "told" a student he/she had demonstrated or performed well one or more of the critical performance elements) and 2) was directed to an individual, individual/public, or group, according to the two major a priori determined categories identified below - accuracy and skill level.

Accuracy of the feedback. Accuracy was determined by observing the videotaped record of motor skill performance of each person to whom the affirming "Rapid Fire" feedback was directed. Depending upon whether or not the critical performance elements that were affirmed by the teacher were actually demonstrated in the motor skill performance of the student(s), the feedback was coded as one of the following:

- Accurate;
- Inaccurate.

Skill level of the student(s). The motor skill level of each student to whom the "Rapid Fire" feedback was directed (i.e., I, I/P, Individuals within G was coded according to the following:

- High;
- Medium;
- Low.
Findings

Findings from the researcher's analysis of the five categories described above are presented as the percentages of feedbacks/students within each subcategory of the major category. The findings in Table 38 show that 53% (n=49) of the 93 interactive episodes that contained the "Rapid Fire" category of information served an "affirming" function. Forty-four percent served the "Do It" function. Further, the data show that critical performance elements were the focus of 96% of those "affirming" and "Do it" statements. These critical performance elements focused upon during practice were the same critical elements identified by the teacher during the Task Presentation Phase. Thus, the data support the existence of a strong tie between the teacher's verbal statement of expectations for work and student work recognized by the teacher during practice.

Continuing examination of the data in Table 38 reveals that 89% of the interactive episodes (83 of 93) that contained "Rapid Fire" feedback were directed to individuals or a small group rather than to the class as a whole (i.e., 69% to individuals, 20% to groups). Though not shown in Table 38, analysis of the target of the feedback also revealed that the function of the "Rapid Fire" feedback in all of the 83 episodes but three was affirming in nature. Thus, all but three of the 49 interactive episodes that contained "Affirming, Rapid Fire" Feedback were between either the teacher and an individual student or the teacher and a group - not between teacher and class.
Table 38

Percentage of "Rapid Fire" Feedback/Students in Each Category

<table>
<thead>
<tr>
<th>Function of Feedback (n=93)</th>
<th>Congruency of Feedback (n=93)</th>
<th>Target of Feedback (n=93)</th>
<th>Accuracy of Affirming Feedback (n=93)</th>
<th>Skill Level of Student Receiving Affirming Feedback (n=93)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affirming Do It (n=49)</td>
<td>Major Critical Task Elements (n=8)</td>
<td>I I/P G C (n=8) (n=56) (n=19) (n=10)</td>
<td>Accurate Inaccurate (n=41) (n=5)</td>
<td>High Med. Low (n=41) (n=25) (n=12)</td>
</tr>
<tr>
<td>53% 44% 9% 96% 9% 60% 20% 11%</td>
<td>89% 11%</td>
<td>53% 32% 15%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
When these forty six "Rapid Fire" feedbacks were coded for accuracy, the data show that 89% of the feedbacks that affirmed the demonstration of one or more critical elements in students' motoric performance were accurate. Eleven percent were inaccurate.

The data presented thus far show that in the most frequently occurring category of information communicated to students during practice, a strong tie existed between what the teacher stated as the focus for student practice and what the teacher recognized as important about students' performance during practice. Further, the data showed that information that communicated an "affirming" message was generally an accurate description of students' motor skill performance. Thus, the information communicated via this category appeared to be supportive of students' motor skill performance.

Interaction with these data generated questions about the value of the "Rapid Fire" feedback process described above particularly when data were considered relative to the skill level of the participants to whom the feedback was delivered. The data in Table 38 show that 53%, 32%, and 15% of the seventy-eight students to whom the Rapid Fire "affirming" feedback was directed were high, medium, and low skilled students respectively. Thus, over half of the students who were told that they had demonstrated the stated critical performance elements well were the highest skilled students in the class. High skilled students constituted seven out of the 32 students in the class (i.e., 22%) while low skilled and medium students constituted 78% of the class (i.e., approximately 25 students).
The findings in this section focused upon seven recurring patterns of information communicated by the teacher during the Student Practice/Teacher Interaction Phase of the Movement Task Unit. In addition, the most frequently recurring pattern, "Rapid Fire/Task Driven Feedback", was explored in greater depth. The findings showed that the primary recipients of this most frequently occurring feedback, which functioned as praise for the student's motoric performance, were the seven most highly skilled students in the class.

Question 3.2.5: Analytic Processes

Data for exploration of six (i.e., n=3 high skilled; n=3 low skilled) target students' motor skill responses were obtained via a microanalysis of the students' motor skill responses for the overhead pass and forearm pass during the four microanalyzed lessons (i.e., Lessons 1, 2, 8, 12) and Lesson 14, the last lesson. This process involved the researcher and an external observer simultaneously but independently, using four a priori determined categories to code each of the six students' skill responses for the designated two motor skills during alternating Movement Task Units, plus the last Unit, in the five lessons. The categories were:

- Successful (S);
- Unsuccessful (U);
- Lack of Opportunity to Respond (L-OIR);
- Non-Codeable (NC)

Findings are reported only on the "Successful Category".

The product of this two part analytic process was the determination of a Response Rate Per Minute (RR=PM) for each target
student for each of the five microanalyzed lessons (i.e., Lessons 1, 2, 8, 12, and 14). In addition, a second measure—Successful Response Rate Per Minute (SRR-PM) for lesson—was determined for each of the six target students on the five days microanalyzed, Lessons 1, 2, 8, 12, and 14 (See Chapter III for an explanation of the formula for calculating the rate per minute measures).

Question 3.2.5: Patterns of Students' Motor Skill Responses

Graphs are used to display both RR-PM and SRR-PM data for each of the target students. The graph was selected as one primary means for presenting the findings because it permitted visual analysis of the data. The process of visual analysis facilitated exploration of patterns of responding.

Comparison of Patterns of Motor Skill Response Rates For Low and High Skilled Students

Figure 18 shows the pattern of the rate of motor skill responses per minute for the three high and low skilled target students across lessons sampled. The data show that while variability in response rate existed within and across skill levels, the general pattern of responding among target students was similar. Triangulation of findings from Section 1.4 on the taxonomy of major movement tasks with the present findings on response rates indicated a primary reason for the dramatic decrease in response rates in both the high and low skilled groups after the first three lessons.

Findings for Section 1.4 indicated that the nature of the academic movement tasks during the first two lessons contributed to
Figure 18. Response rate per minute for high and low skilled students.
the high scores in those lessons (i.e., push-catch to self; overhead pass continuously to self; partner toss-overhead pass back; one passing continuously with one). After the first two lessons, these movement tasks did not reoccur during the fourteen lessons (i.e., There was one exception. "Overhead pass continuously to self" occurred in Lesson 5). When students were engaged in self passing tasks during the first two lessons - tasks that were shown in Section 1.4 to be the least complex tasks in the taxonomy - the response rate was higher (i.e., Range: 9-13 RR-IM) than it was after Lesson 3 (Range: 2-10 RR-PM) when the academic tasks became more complex motorically.

Comparison of the response rates per minute (see Figure 18) for the three high skilled students with those of the low skilled students within lessons sampled shows that there were minimal differences within lesson in the rate of responding on the basis of skill level. When differences were present, they were not always in favor of the high skilled student (e.g., In Lesson 1 Fred had a RR-PM of 13, the highest across the six target students; In lesson 12, Tina had a RR-PM of 5, also the highest among the six students). The data show that, on the whole, the skill response rates per minute for the three low skilled students were comparable to the response rates for the high skilled students during lesson.

Comparison of RR-PM within and across lessons for the six target students was somewhat problematic, however, given that the academic movement task engaged in by students was a variable factor across students during lesson. Triangulation of findings from Section 3.1,
3.2.3, and 3.2.4 indicated, and observation of the videotaped record of student practice confirmed, that it was possible for students in the class to be practicing a range of major movement tasks at any given time during lesson. The triangulated findings showed that the reasons for differences in academic work practiced were threefold:

1) Students were given a choice among designated academic movement tasks (See Section 3.1);

2) Students modified the stated movement task without permission from the teacher (See Section 3.2.3);

3) The teacher individualized the academic movement task for student(s) during the Practice Phase (Section 3.2.4).

Because the data in Figure 18 potentially reflected student performance across different rather than the same movement tasks in lesson, comparison across, as well as within, skill levels was difficult if not impossible without knowing the nature of the task(s) actually practiced by students during lesson. While at any given point in lesson students were potentially engaged in movement tasks of varying levels of complexity, there were minimal differences, in the rate of responses per minute across skill levels.

Findings regarding the Response Rate Per Minute summarized at the macro level of lesson indicate on a given day what the response rate per minute was for a student during lesson. The measure of Response Rate per Minute for lesson does not, however, provide information about the level of success of those academic responses. To obtain information about the success of the academic work demonstrated by students both within and across skill levels, it was necessary to
examine the relationship between the Response Rate Per Minute (RR-PM) for lesson and the Successful Response Rate Per Minute (SRR-PM) for lesson.

**Comparison of Patterns of Successful Motor Skill Response Rates for Low and High Skilled Students**

Figure 19 permits exploration of the relationship between RR-PM and SRR-PM across the two skill levels. This relationship is visually highlighted by comparison of the difference in the vertical distance between data points or rate per minute measures for each of the three high skilled students to the difference in vertical distance between data points for each of the low skilled students in each lesson sampled.

Visual analysis of the data in Figure 19 indicates a considerable difference in successful motor skill performance for the two skill levels across the five lessons. The high skilled students demonstrated a pattern of responding during Lesson in which the vertical distance between the RR-PM and SRR-PM within lessons was less than that of the low skilled students. The high skilled students thus had a higher percentage of successful responses per minute than the low skilled students. While findings previously showed there were minimal differences between the two groups in RR-PM for lesson, the present findings indicate that low skilled students were less often successful in their performance of the academic movement task.

The data in Table 39 help to contextualize the relationship between the RR-PM and SRR-PM for lesson. Table 39 shows the
Figure 19. Rate per minute of responses and successful responses for high skilled students (H) and low skilled students (L) in five lessons. (Closed and open circles represent total responses per minute, and closed and open triangles represent successful responses per minute).
Table 39

**Percentage of Successful Motor Skill Responses for Each Target Student in Five Lessons**

<table>
<thead>
<tr>
<th>Student</th>
<th>1</th>
<th>2</th>
<th>8</th>
<th>12</th>
<th>14</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SR/TR</td>
<td>SRR-PM/RR-PM</td>
<td>%</td>
<td>SR/TR</td>
<td>SRR-PM/RR-PM</td>
</tr>
<tr>
<td>Brenda</td>
<td>50/74</td>
<td>7/10</td>
<td>68</td>
<td>51/81</td>
<td>6/10</td>
</tr>
<tr>
<td>Jody</td>
<td>50/65</td>
<td>8/9</td>
<td>83</td>
<td>70/96</td>
<td>8/12</td>
</tr>
<tr>
<td>Dustin</td>
<td>65/84</td>
<td>9/12</td>
<td>77</td>
<td>62/86</td>
<td>8/10</td>
</tr>
<tr>
<td>Craig</td>
<td>31/73</td>
<td>4/10</td>
<td>42</td>
<td>33/89</td>
<td>4/11</td>
</tr>
<tr>
<td>Fred</td>
<td>60/92</td>
<td>8/13</td>
<td>66</td>
<td>50/90</td>
<td>6/11</td>
</tr>
<tr>
<td>Tina</td>
<td>57/85</td>
<td>8/12</td>
<td>67</td>
<td>33/73</td>
<td>4/9</td>
</tr>
</tbody>
</table>

SR/TR = Successful Responses/Total Responses  
SRR-PM/RR-PM = Successful Response Rate Per Minute/Response Rate Per Minute  
\% = Percent Successful Responses
percentage of successful responses made by each student during lesson. This measure aids in the interpretation of the vertical difference between the RR-PM and SRR-PM for a student. For example, Brenda's 7/10 SRR-PM to RR-PM ratio during Lesson 1 represented a 68% measure of successful responses for that lesson. A comparison of the percentage of successful skill responses across skill levels during each of the five lessons reemphasizes the difference between the two groups with respect to the rate of successful motor skill responses during lesson.

Within each of the five days sampled, there were no instances where a low skilled student had a higher percentage of successful responses than a high skilled student. Not only were high skilled students consistently successful more often than low skilled students during lesson, the higher skilled students were considerably more successful. The range in percentage of successful responses for high skilled students was 63% - 88% while the range for low skilled students was 22% - 67%. The median was 74% and 47% respectively.

The Effect of Differentiated and Undifferentiated Practice

Given one, the distinct difference between the two skill groups in the level of successful performance demonstrated and two, the variable nature of the major movement task that resulted in a particular level of success for students, questions were raised about the differentiated nature of work engaged in by students. To explore the differential nature of student practice, it was necessary to reenter the videotaped record of lessons at the point of the Practice
Phase of Movement Task Units to determine the specific major movement task that was the focus of student practice. Illustrative findings are presented below.

Analysis of the differential nature of work showed that in Lesson 8 and 12, the three high skilled students practiced a four-on-four major movement task while the three low skilled students practiced a two-on-two task. The former task was rated as the most motorically complex task within the taxonomy. The three low skilled students, while practicing a two-on-two major movement task, had a RR-PM for Lesson that was comparable to the rate of responding for high skilled students, who practiced a more complex four-on-four task. The similarity in RR-PM for lesson for high and low skilled students during Lessons 8 and 12 was more a product, therefore, of the differential nature of the academic movement task practiced than of a real similarity in rate of responding.

While the differential nature of academic work produced similar response rates across skill levels during Lessons 8 and 12, the difference in task complexity was insufficient to produce similar measures of successful performance across skill levels. Previous examination of the data in Table 39 showed that the percentage of successful responses during Lessons 8 and 12 was considerably lower for the low skilled students, practicing a less complex task, than for the high skilled students. In Lesson 8, the percentage of successful responses for low skilled students was 46% and 52% while the percentage of successful responses for high skilled students was 75%, 67% and 69%; In Lesson 12, the percentage of successful response
for low skilled students was 25% and 22% while for high the percentage was 72% 88% and 63%. In these two lessons, then, the differentiated major movement tasks permitted high and low skilled students to have a similar frequency (and rate) of motor skill responses, but not similar quality of responses.

Continued analysis of the differential nature of work engaged in by students in the ten lessons sampled showed that when both groups practiced the same major movement tasks, there were similar RR-FM for high and low skilled students only in Lessons 1 and 2. In all other lessons the RR-FM for high and low skilled students was 1) similar - when the major movement task practiced varied across skill levels, that is, when low skilled students practiced less motorically complex tasks or 2) higher for high skilled students - when students of both skill levels practiced the same major movement task. These data indicate that while initial findings showed a pattern of similar rates of responding, the reason for the comparable rates was the less complex nature of the academic work engaged in by low skilled students.

The findings thus far have highlighted the role of the academic movement task as a factor influencing the pattern of motor skill responses for high and low skilled students. The findings showed that when student practice of the academic movement task was differentiated, the rate of responding for the two groups was comparable. When practice was not differentiated, high skilled students had a higher response rate. Regardless of the nature of practice, high skilled students consistently had higher percentages
of successful responses during the five lessons than low skilled students. With the exception of Lesson 1, the differences between the percentages were considerable.

Within Student Pattern of Responding

The findings in the preceding section examined the differences in patterns of motor skill responses for high and low skilled students. One additional pattern of motor skill responding is presented below. This pattern is a within student pattern of responding. Identification of the pattern was made possible as a result of the analysis of the differential nature of academic work engaged in by students. This pattern is presented because it permitted the identification of a factor that positively influenced the motor skill performance of at least three low skilled students in the physical education class. The findings are presented in the form of a case description of one of these students - Craig. The findings show that a primary reason for Craig's improved motor skill performance in this lesson was the skill level of the student(s) with whom Craig chose to work.

The findings presented earlier in Figure 19 show that in Lesson 1, which had the least complex of all the major movement tasks, Craig had a ratio of four successful responses per minute to ten total responses for Lesson, and in Lesson 2 he had a ratio of four successful responses per minute to 11 total responses per minute. These ratios represented a percentage of successful responses of 42% and 37% for Lessons 1 and 2, respectively. A return to the Student
Engagement Profile (Table 30) showed that Craig was coded as consistently engaged during all Movement Task Units in these lessons but one (i.e., In the one exception, he was coded as Mostly Engaged - Category 2). Thus, these measures of Craig's performance reflected "real" efforts at practice of the major movement task during Lessons 1 and 2. These lessons have already been shown to have the least complex major movement tasks of all lessons in the unit.

Craig's level of successful performance on the first two "easy task" days of the volleyball unit provided a baseline measure for considering his level of performance in Lesson 8. The major movement task practiced by Craig throughout this Lesson 8 was a four-on-four task, the most complex of all the major movement tasks in the taxonomy. The findings in Figure 19 show that in this lesson Craig had a ratio of two successful responses per minute to four responses per minute for lesson. This ratio represented a 50% measure of successful responses during the lesson (See Table 37). Craig's baseline measure of successful performance for the "easiest task" was lower, therefore than the measure of performance for the "most difficult" task in Lesson 8.

This contrast in Craig's performance raised questions regarding the reason(s) for improvement. To identify possible factors influencing the shift in performance, it was necessary to re-enter the videotaped record at systematically selected Lessons (i.e., Lessons 3, 5, 7, 9, and 11) at the Point of the Practice Phase of the Movement Task Unit. Re-entry at this point permitted the identification of one factor that positively influenced Craig's motor
skill performance in Lesson 8 - the skill level of the individuals with whom Craig worked. The identification of this factor was, again, made possible as a result of a contrast in observed patterns of student practice. In Lessons 3, 5, 7, 9, and 11 Craig practiced less complex tasks with primarily low, but occasionally medium, skilled students. In contrast, in Lesson 12, Craig practiced the four-on-four task with six high skilled and one medium skilled student.

There was a distinct difference between the low/medium and high skilled groups in terms of the qualitative aspects of practice. When Craig practiced with the low/medium skilled students, play was frequently "rough" and "discontinuous". Play was "rough" because the passing action of the low skilled students frequently resulted in a passed ball that was difficult for the next low skilled receiver/passer to handle. For example, the ball was passed too low, too hard, with a poor trajectory, and so on. These characteristics made the pass "rough" and thus set the next player up with a poor ball to play. This player's ensuing pass was frequently as "rough", if not "more rough", than the first player's pass. This "rough" characteristic contributed to the "discontinuous" characteristic of the play of low skilled students. Play was discontinuous because it did not last long. Students could make only a few passes in a row - usually one or two and only rarely more than three - before the ball went askew and the process was thus repeated.

These "rough" and "discontinuous" characteristics helped to define the qualitative pattern of practice observed when Craig played
with low skilled performers. This pattern was labeled the "wheels spinning in the mud syndrome". It was so named because Craig and the students with whom he played seemed to spend their efforts getting started with practice, that is, "getting the ball going" in the air rather than "keeping the ball going".

When Craig played in the four-on-four task with high skilled students, the qualitative pattern of practice observed in lesson 12 was, in comparison, "smooth" and "continuous". Play was "smooth" because the passing action of the high skilled students frequently resulted in a passed ball that was easier to handle than if it had been passed by low skilled students. In addition, the high skilled students were better able to receive a "roughly" passed ball and turn the ensuing pass into a "smoothly" passed ball. The high skilled group with whom Craig played both made more consecutive passes and better passes than low skilled students made. The contrast between Craig's level of successful motor skill performance when practice occurred with other low skilled students and the level of successful motor skill performance when practice occurred with high skilled students indicated that the latter group positively influenced Craig's performance of the academic movement task.

The discussion above highlighted one factor that contributed to the improved motor skill performance of at least three low skilled students at various times during the 14 day instructional unit. The representative findings indicated that low skilled students demonstrated improved performance when they played with more skillful players.
SUMMARY OF THE FINDINGS

In this chapter findings were presented relative to the three major Research Questions and their constituent subquestions. Given the extensiveness of the findings, a general summary of the results is presented prior to the discussion of the findings in Chapter V.

Lesson Organization
1. Lesson was a differentially organized learning environment that had both stable and variable parts.
2. The multi-faceted nature of lesson organization resulted in a shifting set of expectations that required constant monitoring on the part of the student.
3. Lessons were organized and conducted around a series of recurring major movement tasks.

Social Structure
1. Students' actions and interactions in the physical education class were guided by a series of normative expectations for lesson participation.
2. Though these rules of conduct were differentially established and maintained, the manner in which they generally were established and maintained was a source of positive influence on students' academic performance.
3. The normative rules of conduct were differentially linked to the performance of academic work.
The Academic Task Structure

1. The effective communication of information about academic work occurred via a of 13 constructs of information that were both social and academic in nature.

2. While consistent student engagement in practice of the academic movement task was a relatively stable pattern of action, variability in the level of engagement did occur.

3. Student modification of academic work was primarily a function of four factors:
   a) the unwillingness of a student to be a cooperative participant in lesson;
   b) the peers with whom a student practiced;
   c) the inappropriateness of the academic movement task;
   d) the lack of clarity of the teacher in presenting information about academic work.

4. Providing feedback to students that helps them to improve upon their motor skill performance is a complex process that involves consideration of a variety of factors.

5. Differential skill levels in the physical education class necessitated differentiated academic work.

6. Several low skilled students performed better academically when they practiced with high skilled students.
CHAPTER V
DISCUSSION OF THE FINDINGS

Past research on classroom processes from a social interaction perspective has provided a view of lesson as a highly complex phenomenon that has three primary features: an organizational structure, a social structure, and an academic task structure. The view of lessons provided by this work is reflected in the diagram in Figure 5 (i.e., see Chapter IV). This diagram suggests that academic learning is actually embedded in and influenced by the social structure of the lesson as well as the organizational structure. Figure 5 also suggests that these three dimensions are not separate entities. Rather, they have been shown to be co-occurring dimensions of a single process that are both dynamic and constructed in nature.

The view of lessons just described is different from the manner in which research on teaching has traditionally conceptualized instruction in physical education. Contrary to traditional approaches, the present approach goes beyond examination of the actions and behaviors of teachers and the actions and behaviors of students and focuses on the interactions of the two. What will be presented in Part 1 of this Chapter, then, is a discussion of what has been learned about the 14 lessons and the nature of instruction in the physical education class from a social interaction research approach. To answer questions about daily life in the physical
education class, however, it was necessary to examine the layers of complexity one at a time. Thus, the discussion in the first part of this Chapter explores the three major components of the lesson, that is, the organizational, social, and academic dimensions of instruction, as well as the interrelationships across the parts.

Given that one of the goals of the study was to identify factors that supported and constrained students' academic motor skill performance, the discussion occurs in light of those factors.

The second major goal of this study was to explore the nature of the research approach itself. Therefore, once the discussion has been presented regarding the nature of instruction, an exploration of the research approach will be undertaken in the second major part of the Chapter. Given the focus of the discussion in this part on the research approach, implications for research are embedded within this discussion. Finally, the Chapter concludes with a discussion of the directions for future research in the third part of the Chapter.

THE NATURE OF LESSONS AND INSTRUCTION IN THE PHYSICAL EDUCATION CLASS

The findings on lesson organization showed that the lesson was a multifaceted phenomenon that had both stable and variable phases or parts. Observation of the actions and interactions of participants suggested that the stable parts of the macro-organizational structure of the lesson, as well as those subparts within this structure,
facilitated a shared frame of reference between teacher and students regarding the conduct of academic work.

When variability or change in the organizational structure of the lesson did occur, change was not problematic in this class, because, it appears, change was grounded in a larger pattern of stability in organization within and across the fourteen lessons. Further, variations in lesson organization were all related to the conduct of academic work and thus maintained the instructional emphasis on motor skill performance. The manner in which variability in lesson organization occurred in the physical education class, therefore, allowed the changing organizational structure of the lesson to be a support, rather than a constraint, upon student learning.

The differential nature of lesson organization resulted in a set of demands being placed on students that were shifting, rather than static, in nature. In order to participate appropriately and carry out the academic work, it was necessary for students to continually monitor the changing demands as the expectations unfolded during the lessons. The role of the student, therefore, was an active, not a passive one.

Students in the physical education class were generally successful at identifying shifts in the organizational structure and meeting the changing expectations within the various parts of the lesson. Triangulated findings from the social and academic dimensions of instruction suggested that one reason students were successful at complying with a shifting set of organizational demands was that shifts in the organizational road map of lesson were
made clear to students. Thus, students were free to focus their attention on the academic demands of the lesson, rather than having to concentrate on the demands imposed by a differentially organized lesson structure.

Just as the 14 lessons during the volleyball unit shared recurring aspects or features of lesson organization, these lessons were also tied or linked to one another in terms of the performance of academic work. The 11 recurring major movement tasks that were presented by the teacher via a spiraling and overlapping approach indicated that the lessons were actually tied to or built on one another and that what occurred on a given day of instruction influenced the nature of the academic work conducted on other days. A lesson, then, was not a separate entity within a unit of instruction but was part of a larger whole.

The present findings on lesson organization are similar to other findings from research on classroom processes conducted from a social interaction perspective that have provided a view of a lesson as a phenomenon that evolves over time and has differentiated parts with varying demands for participation (e.g., Bales & Strodbeck, 1967; Erickson, 1982; Mehan, 1979; Wallat & Green, 1982; Florio & Shultz, 1979). Past work on instruction in physical education has largely ignored the organizational structure of the lessons as a source of influence on students' academic performance. Failure to consider lesson organization in past studies of teaching and learning suggests a view of the organizational structure of the lessons as static and unidimensional in nature and as having little influence on
the conduct of the academic work. Present findings, to the contrary, reflect the view of lesson organization as a multifaceted phenomenon whose differentiated parts are a source of influence upon students' academic performance.

The discussion has thus far focused upon the organizational nature of the lessons in the volleyball unit. This focus on the organizational structure that was constructed over time in the physical education class provides the broader context of issues of stability and variability in which to look at and understand the nature of the academic task and the factors that supported and constrained students' motor skill performance. Co-occurring with this developing organizational structure was a social structure. It was through this social interaction that the demands for lesson participation were communicated. The next layer of complexity to be examined, then, is the social dimension of the lesson.

A specific set of social demands was identified that supported the performance of academic work in the physical education class. Students did not have to extract the demands for appropriate lesson participation. Rather, the demands, in most cases, were stated up front by the teacher and were continually referred to during the ongoing social interaction in the lesson on a proactive basis. This process of proactive resignaling acted as a guide to students' actions and behaviors during the lesson and helped to keep them on track in terms of their academic work.

The present findings are consistent with those from other studies of classroom processes conducted from a social interaction
Perspective (e.g., Green, 1983a, 1983b; Wilkinson, 1982; Borman, 1982) as well as from work on classroom management. In the latter, Kounin's (1970) found that prompting and group alerting, teacher strategies for focusing students' attention, were used effectively in promoting student involvement in academic work. Students who carefully monitored the ongoing interaction during the class received cues to appropriate lesson participation. In addition, there was consistency on the part of the teacher in terms of what was verbally signaled — either proactively or reactively — and what was actually accepted as appropriate participation. Little "guess work" was needed on the part of students, therefore, to identify the demands for appropriate participation. According to Doyle (1979), "guess work" results in ambiguity on the part of students and is the product of "gaps in information about performance expectations . . ." (p. 194). Doyle (1979) goes on to state that "Many of the student strategies that have been described in recent naturalistic studies of classrooms . . . [were] . . . directed toward reducing, ambiguity and risk . . ." (p. 194). Work by Florio (1980) has led her to suggest that the teacher is the only native in the classroom and that the task facing the student is to identify the real expectations for being a student in the class. Both present and past work suggest, therefore, that to the extent that these expectations are made visible (Philips, 1972) to students, the social structure will be supportive of the performance of academic work.

Given that students generally knew the demands, instruction was, for the most part, smooth and continuous rather than interrupted by
attempts to reestablish expectations. Following Kounin's (1970) classroom management findings that momentum and a smooth flow to instructional activity are supportive of the conduct of academic work, this forward moving feature of the lesson allowed a consistent focus on the academic work. Research on classroom processes from a social interaction perspective has shown that when there are continuous breaks in the flow instruction during lessons, these breaks ultimately can impact upon what students come to know or learn academically.

Though a series of normative rules of social action were identified in the physical education class, these rules were not functionally equivalent. Rather, these norms were differentially linked to the actual performance of academic work. These findings suggest that no one single norm or variable was responsible for the normative climate that was supportive of the conduct of academic work in the physical education class. Rather, the interaction among variables or demands placed upon students promoted the supportive climate. Student adherence to these norms was "up and down" though it basically occurred within a narrow band or range. This aspect of gymnasium life suggests that some slippage in rule adherence does not affect the overall support of the academic structure, and is even to be expected given that students are not assumed to be robots that mechanically follow rules and that social norms are not assumed to be static in the instructional setting. Research on classroom processes conducted from a social interaction perspective of analysis has shown that, following the notion of Blumer (1969), social norms
are established, maintained, checked, suspended, and reintroduced (e.g., Cook-Gumperz & Gumperz, 1976; Corsaso, 1981; Erickson & Shultz, 1981; Wallat & Green, 1982; Mehan, 1979; Green & Harker, 1982). Further, this work has shown that some norms in classrooms are negotiable while others are not. Thus, the present findings, when considered collectively with other work, suggest that the empirical question is one of for which norms or rules can there be slippage or negotiation without constraining the academic performance of students.

The preceding discussion examined the social dimension of the 14 lessons in the volleyball unit. Given that the social structure as well as the organizational structure have now been explored, the focus can shift to academic movement task which is both embedded in and interconnected with these two structures.

The academic movement task, the primary unit of academic work in the physical education class, was not a unitary phenomenon. Rather, it was a differentiated structure that had at least two parts — a Task Presentation Phase and a Student Practice/Teacher Interaction Phase. While the academic task consisted of two parts, these parts were not unrelated, however. In order to explore the complexity of this two part structure, it is necessary, as it was in the exploration of the lessons, to examine the layers of complexity one at a time. The academic movement task, then, will be explored first in terms of Task Presentation and secondly in terms of Student Practice/Teacher Interaction.
The findings showed that the teacher effectively communicated information about practice of the major movement task. The effective communication of information about academic work during Task Presentation was a dynamic and complex activity that involved the skillful articulation of a variety of different kinds of information related primarily, though not entirely, to the performance of academic work. These findings reveal a picture of the complexity of what students need to know and what teachers need to communicate in order to get to the actual academic task — the practice of the major movement task. Given the view of both the student and teacher as active processors of messages who must continuously monitor the ongoing instructional flow of events, of equal importance from a research perspective is an understanding of not only what information communicated by the teacher but also how that information gets communicated.

While the primary emphasis of the teacher during Task Presentation was communication of information about academic work, the teacher’s efforts at maintaining the social structure reflected the view that the academic task was embedded within a broader social structure. The findings indicated that effective communication of information regarding the academic task was, in part, dependent upon the ability of the teacher to monitor and process, on both a proactive and reactive basis, the ongoing social dimension of the lesson. These findings are in concert with other findings from research on classroom processes that show that the failure of the teacher to monitor what is occurring socially can impact what
students learn from an academic standpoint (Erickson, 1982; Weade, 1985; Green & Harker, 1982; Green & Weade, 1985; and Bloome, in press). Similarly Brophy & Good (1986), who are representative of researchers from the Process-Product research tradition, likewise indicate the need for research approaches that "recognize that classrooms are complex social settings in which teachers must process a great deal of information rapidly, deal with several agendas simultaneously, and make quick decisions throughout the day" (p. 370).

Now that a description has been given of the nature of effective communication during Task Presentation, the next layer of the academic movement task to be explored is the co-occurring Student Practice/Teacher Interaction Phase. The Teacher Interaction dimension is explored first given the close linkage between the nature of information communicated during practice and the information just explored in Task Presentation.

Like the effective communication of information during Task Presentation, the communication of information during practice was a complex and dynamic multifaceted phenomenon. The nature of information communicated during practice was very similar to that during task presentation, thus reflecting consistency in the academic and social demands placed on students. Consistency in the nature of teacher interactions prior to and during practice facilitated a shared frame of reference between teacher and students regarding these requirements.
While consistency in the nature of information communicated to students was a stable pattern of interaction in the class, the findings also revealed the differential manner in which the teacher distributed this information to students. The findings showed that the most frequently occurring category of information was Rapid Fire feedback - which functioned as specific praise for a student's motor skill performance. The findings also showed that the primary recipients were the seven most highly skilled students in the class. Given that low and medium skilled students constituted 78% of the class (n = 25 students), questions were raised regarding the overall effectiveness of the teacher's practice of directing the predominance of her interactions to students who started the volleyball unit as the most skillful participants in the class. The effectiveness of teacher interaction during practice in terms of actually helping students to improve their motor skill performance, the goal of the instruction, was seen as questionable, therefore, even though the teacher displayed many of the behaviors and actions of what traditional research has considered to be effective teaching (e.g., giving positive, specific, and accurate feedback that was congruent to the stated task; providing active supervision; providing positive reinforcement). These findings suggest the complexity of what is involved from an instructional perspective in terms of meeting the goal of instruction of improved motor skill performance. The findings also suggest the complexity of what is involved from a research perspective in terms of identifying the supports and constraints upon students' academic performance.
The preceding discussion focused on the nature of teacher interactions during practice. Now that this layer of the complexity of instruction has been examined, it is necessary to explore students' academic performance during the Student Practice portion of the academic movement task. Given that one of the goals of the study was to identify factors that supported and constrained students' motor skill performance, it is appropriate that the last layer of complexity of the lesson that is examined is academic work performance. The discussion highlights two primary dimensions related to academic work — one, the nature of engagement in practice of the academic movement task and two, the nature of students' motor skill responses.

Engagement in the practice of the academic movement task was not an all or none phenomenon in the physical education class. In addition, consistent engagement in work by a student during one movement task did not mean that consistent engagement would occur in the next task. The state of appropriate engagement in academic work was a delicate state, therefore, that reflected the complexity of what must be considered from an instructional perspective in order to get students consistently engaged in practice and keep them there.

The findings on academic performance suggested that ultimately it was up to the student to decide what got accomplished and what got learned in the physical education class. Doyle (1986) suggests that order in the classroom is achieved with students and depends upon their willingness to follow along with the unfolding of the event" (p. 396). He maintains further that "while in the daily world of a classroom, order can, and often does exist without full and
continuous involvement by all students in learning tasks, . . . for the purpose of learning all students . . . [must agree to cooperate in the learning tasks] (Doyle, 1986, p. 396). Both present and past work (e.g., Wilkinson, 1982; Green, 1983a; Doyle, 1986; Erickson, 1982; Bloome, 1981, etc.), therefore, suggest that while the primary responsibility of the teacher is to act as the instructional leader in the class, that role can only be fulfilled when students and teachers are partners in the teacher/learning process. Even when the student was a willing participant in academic work, the challenge facing the student was considerable. If appropriate participation in lesson was a concern to the student, then he/she had to monitor carefully the selection of peers with whom to practice. Given the complex and dynamic pace of the gymnasium environment, the monitoring of peers with whom to practice can be problematic.

In addition, the findings on student modification of academic work showed that students were not merely receivers of and responders to the academic work expectations. Instead, students interacted with the work, they "tried it on for size", and discarded/attempted to discard the work if it did not "fit" their skill level needs. These findings compliment work by Tousignant (1982) that showed that students who found a movement task too easy were likely to modify the task. An additional finding was that those students who "engaged in modified tasks were not likely to learn the criterion material" (Tousignant & Siedentop, 1982). The present findings, to the contrary, indicated that the high skilled students in the volleyball class who modified and extended (Rink, 1979) the stated movement task
were more likely to engage appropriately in work and actually work on their passing skills when the task was more challenging and appropriate for their individual skill levels. These findings indicate, therefore, that a single set of work expectations was not likely to meet the goal of instruction of improved motor skill performance. The task facing the teacher, then, was that of planning for and orchestrating multiple sets of work expectations. From an organizational as well as an instructional perspective, this task is complex.

Findings relative to the nature of students' motor skill responses, the final layer of complexity to be explored, were particularly useful in highlighting the complexity of the role of the practitioner in designing and implementing instruction. Two sets of findings discussed below illustrate this complexity.

One set of findings suggested that when students are heterogeneously assigned to a physical education class with respect to their motor skill levels, as was the case in the present class, then the teacher must have developed the complex managerial and instructional skills that are necessary to accommodate these varying skill levels if the goal of improved motor skill performance is to be met. This dimension of instruction, in turn, suggests that the design and implementation of effective instruction would be made less complex, thus increasing the potential for effectiveness, if homogeneous grouping practices within a class were used (i.e., grouping by motor skill ability) rather than heterogeneous practices.
A second set of findings suggested a different position, however. The second set of findings suggested that heterogeneous grouping practices within a class, rather than homogeneous grouping, may actually be necessary, at least with some students, if the goal of instruction improved motor skill performance is to be met. Thus, findings on the nature of students' motor skill responses, when considered collectively, suggest the need for teachers to develop those complex instructional and managerial skills that will allow differentially effective instruction for students of varying skill levels within a single class.

Summary

The discussion in this section has provided a view of the lesson in the physical education class as a highly complex phenomenon that consists of three co-occurring and interrelated dimensions of a single process. Instruction was shown to be a dynamic and complex process in which academic learning was embedded in and influenced by the social structure of the lesson, as well as the recurrent organizational structure. This description of the lessons and the nature of instruction is different from the manner in which research on teaching has traditionally viewed the teaching/learning process in physical education. Given this view, the discussion in the next major part of the chapter explores the nature of the research approach that provided these views of the complexity of both the lessons and instruction in the physical education class.
EXPLORATION OF THE RESEARCH APPROACH

The approach to the research was the study of teaching and learning from a social interaction perspective. Given the views of the lessons and the nature of instruction obtained, the research approach will be explored in terms of nine general issues or concerns it raises for those engaged in the study of teaching and learning in physical education settings.

The first issue involves the nature of the questions permitted by the research approach and the point of identification of these questions. The approach used in this study permitted the identification of an initial set of general questions that focused on the three dimensions of life in the physical education class. From these general questions a series of constituent subquestions was identified. While several of these subquestions were grounded in past work on instruction and were thus a priori determined, others were emergent in nature. These latter questions were the product of interactions with the data that pointed to the need to explore certain dimensions of life in the present physical education class in order to increase understandings.

The issue involving research questions, however, is not one of broad vs. specific, a priori vs. emergent. Rather, the issue is one of the kinds of understandings permitted by these questions. Shulman (1986) maintains that the "framing of a research question, like that of an attorney in a court of law, limits the range of permissible responses and prefigures the character of possible outcomes" (p. 3). The findings in this study indicate the need to study both a priori
determined and emergent aspects of the organizational, social, and academic dimensions of instruction.

The next issue raised by the findings involves the nature of the observational lens used to capture and reflect upon processes of teaching and learning. The view of the lessons and the nature of instruction as complex and dynamic phenomena was made possible as a result of a research approach that utilized a broad lens perspective. A broad lens approach means that attempts were made to obtain as much information as possible about phenomena of interest in order to increase understanding of the object or activity under study.

At least three primary features characterized this broad lens perspective. First, both quantitative and qualitative data were obtained relative to phenomena of interest. Second, analysis focused on both the verbal, social interactions between and among participants as well as the nonverbal behaviors and actions of teacher and students. The findings in this study suggest that research approaches that focus on either of these dimensions alone, that is, quantitative or qualitative and verbal or nonverbal, run the risk of producing a more limited understanding, if not an incorrect understanding, of complex teaching/learning processes. The third characteristic of this broad lens perspective involves the interrelationships of the various parts of the research process. The entire research process was interactive-reactive in nature. Questions and analysis at one point were allowed to interact with questions and analyses at other points. Data extracted to provide
information about a single topic expanded the view obtained of other topics. A broad lens perspective, then, reflects the notion that by expanding the view of teaching/learning processes a fuller and richer understanding of the complexity of these processes can be obtained than by restricting the view to what can be learned from a single source or kind of information.

The third issue suggested by the findings involves the need for research approaches that permit in-depth exploration of the specifics of practice both within and across lessons. Erickson (1986) argues that "mainstream positivist research on teaching searches for general characteristics of the analytically generalized effective teacher" (p. 130). He argues that what is needed to increase understanding of complex teaching/learning processes is documentation of the details of practice.

The search is . . . for concrete universals, arrived at by studying a specific case in great detail and then comparing it with other cases studied in equally great detail. The assumption is that where we see a particular instance of a teacher teaching, some aspects of what occurs are absolutely generic . . . . Other aspects of what occurs in a given instance of teaching are specific to the historical and cultural circumstances of that type of situation. Still other aspects of what occurs are unique to that particular event, and to the participating individuals engaged in it. The task of the analyst is to uncover . . . what is broadly universal, what generalizes to other similar situations, what is unique to the given instance. . . . This can only be done by attending to the details of the concrete case at hand. (Erickson, 1986, p. 130)

The present findings on the complexity of lesson and the nature of instruction were made possible as a result of a research approach that permitted in-depth looking and the application of a comparative
perspective. Dunkin and Biddle (1974) also argued for the need for a comparative perspective in studies of teaching. They maintained that "some phenomena will be found to generalize across contexts while others will be found to be context-dependent" (Dunkin & Biddle, 1974, pp. 439-440), and like Erickson (1986), called for research approaches that utilized a comparative perspective of analysis in order to identify and explore these phenomena. The present findings suggest the need for continued exploration of research approaches that permit detailed observation both within and across cases.

The fourth issue raised by the findings involves the flexibility of the research approach in retrieving information about phenomena of interest. The findings were made possible because the research approach permitted easy reentry into the raw data on a post hoc basis to obtain information. The approach facilitated researcher movement back and forth between the instructional conversation of the lesson, captured by the structural map of the instructional conversation (See Appendix A and Chapter III for a full description of the structural map), and the videotaped record of the actions and interactions of participants — in order to obtain both quantitative and qualitative information relative to the topic at hand. Contrary to many of the methods of recording and storing observations that have traditionally been utilized in research on teaching and learning in physical education (e.g., category systems, checklists, rating scales), the methods used here facilitated the retrieval of information throughout the analytic process. The flexibility of the research approach in retrieving information thus
increases the potential for a better understanding of these phenomena.

Another issue raised by the findings centers around the identification of units of analysis. Shulman (1986) maintains that central to any study is "the unit of instructional activity that serves as the starting point for analyses of teaching" (p. 8). Fassnacht (1982) succinctly identifies the issues related to unit selection:

Decisions about units are of great importance insofar as they establish principles with regard to the statements that can be made about a topic before anything has been discovered about it. By deciding on certain units, the nature of the relationship that can subsequently be discovered is defined. One can neither discover nor construct anything beyond the limits imposed by these units. The unit defines, so to speak, the intellectual limits of possible statements and only allows relationships within the context. (p. 57)

Generally speaking, units of observation can be deductively determined on an a priori basis or inductively derived during the process of analysis. Research on teaching and learning in both classroom and physical education research has generally relied on the utilization of a priori determined units. These units have often been narrowly defined descriptions of teacher/student managerial and instructional behaviors (e.g., waiting; asking question, practicing) (Shulman, 1986).

The present findings on the nature of the lessons and instruction were made possible as a result of the utilization of a research approach that permitted the identification of highly reliable units of observation, grounded in the actions and interactions of the
participants under study. These findings suggest the need for research approaches that permit inductive identification of units of analysis rather than research approaches that rely exclusively on the utilization of a priori determined observational units.

In their 1974 publication of The Study of Teaching, Dunkin and Biddle called for the identification and utilization of units of analysis in studies of teaching such as those units identified in the present study. The highly reliable identification of the inductively derived units of observation (e.g., Task Presentation Phase; Student Practice/Teacher Interaction Phase) suggests the need to explore in future studies whether these units of instructional activity were specific to the present physical education class or whether they can be identified in other physical education classes, or certain kinds of classes. If a generic dimension(s) to these units exists, then it would be possible to increase the understanding of these units of instructional activity through their continued study.

Another issue raised by the findings deals with the bidirectionality of teacher-student interaction and influence. The main of the knowledge base on teaching has come from the process product family of research approaches (Shulman, 1986; Brophy & Good, 1986). Brophy & Good (1986) review this work (e.g., Berliner 1976, Cruickshank, 1976; Gage, 1978; Peterson & Walberg, 1979; and Rosenshine, 1979, to name a few) in the Handbook of Research on Teaching. As noted by the authors, "the research . . . is concerned with teachers' effects on students . . . [and thus] it stresses teacher behavior over other classroom process variables . . ."
(Brophy & Good, 1986, p. 328). Thus, by definition, the primary, though not the exclusive, focus of this research has been unidirectional in nature. In the main, therefore, traditional research has paid little attention to the bidirectionality of student-teacher interaction and influence.

Shavelson, Webb, and Burstein (1986) address the topic of bidirectionality in their "Measurement of Teaching" chapter in the Handbook:

Most of the research on teacher behavior has tended to focus on the teacher's influence on the student. When observational studies do examine student behavior, they tend to focus on the student's response to a teacher's behavior (for example, the student's response to a teacher's question). Rarely have observational studies measured the influence of the student on teacher. Rarer still are studies of the bidirectionality of teacher-student interaction or influence. (p. 72)

The authors conclude their discussion by maintaining that "a unidirectional model of influence from teachers to students or from students to teachers is an inadequate characterization of classroom interaction" (p. 72). The view of instruction obtained in this study as a complex evolving process constructed via the actions and interactions of both teachers and students supports the need for research approaches that explore the bidirectionality of teacher-student interaction and influence.

A seventh issue explored here centers around the theoretical and methodological conceptions of teacher effectiveness. Teacher effectiveness in both classroom and physical education research has traditionally been determined by mean gain scores on end-of-instruction performance tests. Shavelson, Webb and Burstein (1986) maintain:
The fundamental problem with the typical way of measuring teacher effectiveness and its antecedents is that it is devoid of a clear conception of how teaching can directly influence test scores. Improvements in the conceptual foundation for teacher effectiveness research are possible through greater attention to what Doyle (1983) characterizes as academic work and how that 'academic work is experienced by students in classrooms' (p. 59). . . . Actions by teachers that affect the accomplishment of academic work would seem to be the primary basis for judging effectiveness. (p. 58)

Erickson (1986) similarly laments the narrow view of effectiveness that has traditionally characterized much of research on teaching. He maintains that the teaching functions identified by Rosenshine (1983) (e.g., giving feedback, ensure time on task) as related to effectiveness in instruction could be performed in a myriad of different ways, appropriately and inappropriately, on different occasions. How to understand what might be appropriate and what not, in specific cases, goes beyond the bounds of standard research on teacher effectiveness. (Erickson, 1986, p. 133)

Erickson (1986) calls for a conception of effectiveness based upon an expanded view of classroom life that provides "clear detailed evidence about specific classroom processes that are claimed to lead to desired outcomes" (p. 133).

Gage (1963) was perhaps one of the earliest researchers to examine conceptions of effectiveness.

One solution within the 'criterion of effectiveness' approach may be the development of the notion of 'micro-effectiveness'. Rather than seek . . . [a single criterion] . . . for the overall effectiveness of teachers in the many varied facets of their roles, we may varied facets of their roles, we may have better
success with criteria of effectiveness in small specifically defined aspects of the role... Hence, rather than studies of teacher effectiveness, and criteria therefore, we may make better progress if we develop 'micro-criteria' of effectiveness. (p. 52)

The social interaction approach to research in this study permitted a view of effectiveness based upon in-depth descriptions of phenomena that were related to the conduct of academic work and the development of micro-criteria to examine effectiveness within the particular situation (Shulman, 1986). The findings suggest that a greater understanding can be gained of the effectiveness of instructional and managerial practices by improvements in the theoretical and methodological conceptions of effectiveness.

A sub — or secondary — issue related to the need for changing conceptions of effectiveness is raised by the findings on students' motor skill responses. Both Academic Learning Time (ALT) research and Opportunity to Respond (OTR) research have contributed much to our understanding of how students spend their time in physical education classes. Generally, however, the tendency in this research has been to aggregate individual student behaviors across students and across time, thus losing the integrity of the response pattern for an individual student within a single lesson, as well as across lessons. The present work on motor skill response patterns determined the pattern of responding/successful responding for six high and low skilled students both within and across lessons. Variations in the pattern of responding within a single lesson, then, could be linked to specific instructional events within the lesson.
The utilization of students' ongoing response patterns as a within-the-situation or micro-criterion of effectiveness was thus exploratory in nature (i.e., see Earls [1983] for an exception). Shavelson, Webb, and Burstein (1986) address the need for the exploration of student response patterns in teacher effectiveness research:

In our view an important aspect of students' learning is missed when only summary scores are considered. Student responses to test items should reflect their knowledge and thus should be responsive to instruction. . . . Measurement of teaching outcomes, then, should tell us something about the kinds of mistakes they made on the questions missed. Such information is necessary to identify effective and ineffective aspects and components of instructional events. . . . The tendency in teaching effectiveness research has been to focus analysis on the correlates of the average gain across students in the classroom. . . . Stated in its simplest form, class mean gains hide important information about the within-class variability in student performance and experience. Concentrating on class means thus misses evidence of a teacher's differential effectiveness. . . . (p. 55)

The authors conclude their discussion with a call for new conceptualizations in the measurement of teacher effectiveness that move "toward more proximal measurement of the aspects of the teaching process that can influence academic work" (p. 59). Present findings regarding the differential effects of instruction on students' motor skill response patterns highlight the need for continued exploration of what can be learned about the effectiveness of ongoing instructional practices from students' response patterns.

The eighth issue raised by the research approach, and one that is also related to the need for changing conceptions of effectiveness,
involves the manner in which variables have traditionally been conceptualized in the study of teaching. Generally, standard approaches to research on teaching (Shulman, 1986) have relied upon narrowly conceived, decontextualized variables that focus on individual teacher and/or student behaviors (e.g., waiting, demonstrating, observing, practicing, transitioning, etc.). Stripping away the context in which the variable occurs can result in consideration of only the form of the variable but not the manner in which it functions in the setting. Further, narrow conceptions of factors potentially related to effective instruction (e.g., task presentation, teacher clarity) have resulted in both conflicting and limited understandings of these factors. Brophy and Good (1986) underscore the view that narrow conceptions have plagued much of research on teaching: "Conceptualization and measurement of most of the . . . teacher behavior variables . . . are . . . crude and in need of elaboration" (p. 367). The present findings suggest the need for research approaches that consider more broadly conceived, contextualized variables if an increased understanding of complex teaching/learning processes is the goal.

The ninth and final issue highlighted here deals with the primary focus in this study on the academic work in the physical education class. According to Shulman (1986), Doyle (1983), and Shavelson, Webb, and Burstein (1986), among others, exploration of the academic dimension of instruction has not been the specific focus of traditional research approaches. These researchers call for research approaches whose primary focus is on exploring this
dimension of life in schools. Smith (1983) succinctly captures the need for an observational focus on the academic:

The performance of the teacher is shaped by many variables . . . among these is the context of instruction. . . . The teacher interacts with the student in and through the content and the student interacts with the teacher in the same way. (p. 491)

To quote Shavelson, Webb, and Burstein (1986), "there seems to be no sound basis for ignoring subject matter and its 'interactions' with the processes and outcomes of instruction" (p. 54).

Summary

The preceding discussion highlighted a series of issues and concerns raised by both the findings and the research approach that illustrate the complexity of conducting observational research in physical education, as well as classroom settings. If the goal of the research is to increase understanding of complex processes of teaching and learning, then careful thought must be given to addressing these concerns. Now that the findings have been discussed and the research approach has been explored, this Chapter, and this study, conclude with a series of recommendations for future research.

RECOMMENDATIONS FOR FUTURE RESEARCH

The discussion in this section highlights two major sets of recommendations for future research on teaching in physical education using a social interaction research approach. The first set of recommendations consists of a series of particular foci or topics that could serve as next steps for those interested in exploring the nature of the lessons and instruction in physical education. These
topics stem directly from, and thus are tied closely to, the outcomes from this study. The second set of recommendations focuses on the broader potential of the research approach for increasing understanding of life in physical education.

Specific Recommendations: The Next Step

Four topics are highlighted below that, given the findings from this study, provide a potential immediate focus for future researchers engaged in the study of teaching in physical education. For those interested in the study of effective teaching, the assumption here is that understanding effectiveness in instruction can best be arrived at by studying the specifics of practice. Through in-depth detailed study of such aspects of gymnasium life as identified below, it is possible to identify those aspects of effective teaching that are generic or universal in nature, those that are specific to a certain type of situation or class, and those that are idiosyncratic in nature (Erickson, 1986). The topics identified below, then, are starting points for identifying and exploring generic phenomena and generic processes related to effective teaching as they are manifested in the specifics of daily life in the gym.

Task Presentation

and

The Communication of Information about Academic Work

Both present findings and inconclusive/conflicting results from traditional research regarding the relationship of task presentation to effective teaching suggest the need for continued in-depth
exploration of the communication of information about academic work. Pieron & Graham, in their 1984 review of ETU studies in physical education, recognized the need for continued examination of task presentation as an important variable related to effective instruction. Similarly, Brophy and Good, in their 1986 Handbook of Research of Teaching chapter on "Teacher Behavior and Student Achievement," maintain that "many questions about effective instruction have not been studied at all yet, or not studied appropriately . . . [Among these are] qualitative aspects of teacher presentations . . ." (p. 369). Teachers who are effective communicators in physical education classes need to be identified and their efforts at communication need to be explored in-depth in order to identify factors that support/constrain communication during instruction.

Lesson Organization

Present findings indicate the need for continued exploration of lesson organization in order to identify structural elements, and the corresponding demands placed on students, that support/constrain academic performance. These studies need to examine lesson organization across similar and dissimilar physical education classes.

Social Structure

The findings indicate the need for social interaction studies to study teachers who are effective managers in physical education classes in order to identify one, what expectations they have for
students and two, how those expectations get established, maintained, suspended, resigned, and so on in order to sort out the supports and constraints upon classroom management.

**Student Engagement and Response Patterns**

The findings indicate the need for continued exploration of the relationships between students' engagement and skill response patterns and ongoing events within the instructional setting in order to identify more closely sources of influence on students' academic performance.

**General Recommendations:**

The Broader View

Given the newness of the social interaction research approach to physical education, it is important for future research efforts that this work concludes with a view that extends beyond the boundaries of the present study. It is important that consideration is given to the potential of the research approach for increasing understandings of life in the gym on a broader scale than that provided by the present findings, and the closely linked recommendations for research based upon these findings. Future research, therefore, needs to consider carefully the kinds of questions that need to be formulated as well as the kinds of methodologies that need to be developed, to explore in-depth the organizational, social, and academic dimensions of lessons in physical education. These questions can be stimulated by traditional classroom research, as several of the constituent subquestions were in this study. They can also stem from previously
unexplored issues and concerns relative to the nature of instruction and life in schools that, while previously unexplored and perhaps even unconsidered, may represent the more serious problems or pose the more serious threat to learning in today's schools. Throughout this process of exploration, those engaged in the study of teachers and students, and teaching and learning, from a social interaction perspective need to be ever mindful that the view of life obtained is but one view in the midst of many. Careful consideration must be given, therefore, to all views in order to gain the most complete understanding possible of the complexities of life in the physical education.
APPENDIX A

Methodology for Conducting Microanalysis

of the Instructional Conversation
This Appendix describes the specific methodology for conducting microanalysis of the instructional conversation. The methodology presented here permitted the identification and exploration of recurring patterns of action and interaction in the physical education class. The identification of these recurring patterns helped to highlight factors that supported and constrained students’ motor skill performance and, thus, helped to accomplish the goal of the study.

AN OVERVIEW OF MAPPING: THE SPECIFIC METHODOLOGY FOR CONDUCTING MICROANALYSIS OF THE INSTRUCTIONAL CONVERSATION.

Grounded in a social interaction perspective, mapping was the specific approach used to capture and freeze the instructional conversation for analysis and reflection (Green, 1977; Green & Wallat, 1981). A form of discourse analysis, the mapping process allowed the lessons in the unit of instruction to be reconstructed in the form of a map of the unfolding lesson (See Figure 20). This map permitted systematic exploration of the meanings constructed and conveyed via verbal conversation (Graham, Green, Earls, in press). The map provided the basic data from which patterns of action and interaction in the physical education class were extracted.

Map construction involves transcription and segmentation of the instructional conversation into hierarchical units that represent different layers, as well as levels of description. The process used to transcribe and map segments of the instructional conversation is part of an analytic system called the Descriptive Analysis System (Green, 1977; Green & Wallat, 1981). Based on theoretical constructs
<table>
<thead>
<tr>
<th>NTU No.</th>
<th>Transcript Line</th>
<th>Thematically Tied Message Units</th>
<th>Int. Episode</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>END LESSON PHASE TWO</td>
<td></td>
</tr>
<tr>
<td></td>
<td>061</td>
<td>WE HAVE A LIMITED AMOUNT OF TIME IN HERE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>062</td>
<td>AND THERE'S AN AWFUL LOT TO GET DONE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>063</td>
<td>NOW I TOLD YA'LL THE OTHER DAY</td>
<td></td>
</tr>
<tr>
<td></td>
<td>064</td>
<td>I DIDN'T WANT TO STAND UP</td>
<td></td>
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<td></td>
<td>065</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>066</td>
<td>I DIDN'T WANT TO STAND UP HERE DOING THE TALKING</td>
<td></td>
</tr>
<tr>
<td></td>
<td>067</td>
<td>OK</td>
<td></td>
</tr>
<tr>
<td></td>
<td>068</td>
<td>I WANT US TO BE PLAYING</td>
<td></td>
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<tr>
<td></td>
<td>069</td>
<td>THERE ARE TWO THINGS I WANT TO TELL YOU</td>
<td></td>
</tr>
<tr>
<td></td>
<td>070</td>
<td>AND THEN WE'RE GOIN' TO GET GOIN'</td>
<td></td>
</tr>
<tr>
<td></td>
<td>071</td>
<td>NUMBER ONE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>072</td>
<td>I WANT YOU</td>
<td></td>
</tr>
<tr>
<td></td>
<td>073</td>
<td>TO GET GOOD</td>
<td></td>
</tr>
<tr>
<td></td>
<td>074</td>
<td>AT VOLLEYBALL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>075</td>
<td>I WANT YOU TO GET BETTER</td>
<td></td>
</tr>
<tr>
<td></td>
<td>076</td>
<td>OK</td>
<td></td>
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<td></td>
<td>077</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>078</td>
<td>ALL RIGHT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>079</td>
<td>THE SECOND THING</td>
<td></td>
</tr>
<tr>
<td></td>
<td>080</td>
<td>OR THE THING THAT I'M TELLING YOU THAT I WANT YOU WHAT I EXPECT OF YOU IS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>081</td>
<td>IS THAT YOUR WORK ON WHAT I ASK YOU TO DO NOW?</td>
<td></td>
</tr>
</tbody>
</table>

S whispers to another student; T pauses and looks at S talking.
I WANT YOU TO GET BETTER OK

ALL RIGHT THE SECOND THING OR THE THING THAT I'M TELLING YOU THAT I WANT YOU WHAT I EXPECT OF YOU IS IS THAT YOUR WORK ON WHAT I ASK YOU TO WORK ON AND THE SECOND THING IS IS THAT WHEN I BLOW THE WHISTLE OR SAY FREEZE I WANT YOU TO [snaps finger emphatically] I MEAN STOP ON A DIME. STOP VERY QUICKLY HOLD THE VOLLEYBALL GET QUIET AND MOVE TO A POSITION ON THE COURT YOU DON'T NEED TO COME IN BUT MOVE SO THAT YOU CAN SEE AND HEAR ME OK SO THAT'S WHEN THE WHISTLE BLOWS OR FREEZE STOP HOLD THE VOLLEYBALL GET QUIET AND TURN AND OR MOVE SO THAT YOU CAN SEE AND HEAR ME OK

THOSE ARE THE TWO THINGS I EXPECT OF YOU ONE IS TO WORK ON WHAT I ASK YOU TO WORK ON THE SECOND THING IS TO FREEZE ON THE WHISTLE AND DO THAT I IDENTIFIED OK

END PHASE THREE
[C T snaps finger emphatically]
I MEAN STOP ON A DIME.
STOP VERY QUICKLY
HOLD THE VOLLEYBALL
GET QUIET
AND MOVE TO A POSITION ON THE COURT
YOU DON'T NEED TO COME IN
BUT MOVE SO THAT YOU CAN SEE AND HEAR ME
OK

SO THAT'S WHEN THE WHISTLE BLOWS
OR FREEZE
STOP
HOLD THE VOLLEYBALL
GET QUIET
AND TURN
AND OR MOVE
SO THAT YOU CAN SEE AND HEAR ME

THOSE ARE THE TWO THINGS I EXPECT OF YOU
ONE IS TO WORK ON WHAT I ASK YOU TO WORK ON
THE SECOND THING IS TO
FREEZE ON THE WHISTLE AND DO THAT I IDENTIFIED
OK

END PHASE THREE

OK

HOW ABOUT WHEN YOU AND JODY COME UP UP FOR JUST A MINUTE WILL YA AND JUST START PASSING THE BALL USING THE OVER - USING THE KIND OF PASS [C holds ball in overhead pass position]
USING THAT PASS
I'M NOT GOING TO GIVE IT A NAME BUT JUST START PASSING
AND WANT YOU TO WATCH THESE TENTS
(i.e., discussed in Chapter II) from the fields of sociolinguistics, conversational analysis, and the study of teaching, the descriptive system is a multi-step analysis system designed to describe the flow of the instructional conversation. The system is a heuristic tool that allows the instructional conversation to be frozen in systematic ways so that it could be explored for recurring patterns of action and interaction in the physical education class.

The analytic system was simultaneously sufficiently comprehensive and sufficiently flexible to be used in the study of life in the gymnasium. Modifications to the system were minimal and did not sacrifice the integrity of the system. The modification involved the creation and inclusion of new, inductively derived analytic units necessary for consideration of physical activity in the gymnasium. The new units, the Movement Task Unit and its three constituent subparts, Task Presentation Phase, Student Practice Phase, and Transition Phase, as well as the Interactive Episode, were comparable in theory to the units defined in the system (i.e., All units are defined later in the Appendix). The inclusion of these new units allowed this mapping methodology, heretofore applied only to the study of teaching and learning processes in the classroom, to be applied to the analysis of everyday events in the physically active environment of the gymnasium.

This Appendix, then, describes the mapping methodology as used in this study, and the adapted Descriptive Analysis System upon which it was based. Readers interested in additional sources of information
on the full mapping methodology discussed here are referred to Green, 1977; Green & Wallat, 1981; and Graham, Green & Earls, in press.

**Mapping As A Heuristic Tool**

Prior to describing one, the premises upon which the analytic system is based and two, the specific procedures used to construct the maps of the instructional conversation, a brief discussion is presented on the nature of the structural map as a tool for exploring complex instructional and social processes. The structural map of the instructional conversation is a representation of the sequential evolution of instructional conversation and activity embedded in that conversation. The maps capture and freeze the unfolding instructional conversation and activity in theoretically grounded or principled ways (i.e., discussed in "Map Construction" below) that allowed the researcher to identify and explore social and academic activity embedded in the interactions between and among teacher and students. In other words, the map is one reconstruction of the unfolding social and academic activity as accomplished through conversation (Green & Wallat, 1981).

The instructional conversation of lesson is frozen into a series of hierarchical conversational and pedagogical units. Because these units are hierarchical in nature, mapping creates different layers, and as well as levels, of description of each lesson. Different levels of analysis are possible as a result of the systematic layering of different dimensions of the instructional conversation. Depending upon the number and nature of the layers peeled back, a
broad view to a finely gained, or microanalytic, view of lesson is obtained. Different levels of description allow the researcher to shift back and forth across lesson with different lenses of observation in order to explore whole-part and part-whole relationships. The Research Questions and emergent phenomena helped to guide the focusing of the analytic lens.

All of the layers of analyses are required for an adequate portrayal of the whole; however a focus on a particular layer facilitates analysis and understanding of particular aspects or levels of the phenomena being studied (Graham, Green, Earls, in press).

The identification of the various conversational and pedagogical units results in structurally equivalent data sets. Structural equivalence of data sets means that all streams of conversation identified as a particular type of unit represent the same class of phenomena and are determined in the same systematic way. On each occasion that the researcher "looked" at the instructional conversation, therefore, the "looking" occurred in the same manner. What varied was the way in which the unit functioned in a given context. Thus, it was the inductively derived description of unit function that varied -- not the unit itself.

Because data sets were determined in systematic ways, two researchers examining a single instance or occurrence of a particular unit should extract similar structural and functional descriptions of what is occurring. The researcher can look within and across data sets of the same type for recurring patterns and be assured that the data sets that are compared represent the same type, though not
particular instances, of phenomena. The researcher can also be confident that independent observers will derive similar descriptions of the particular instance of a phenomenon.

An illustration is given to highlight the process of designation and description of structurally equivalent data sets. One of the premises of the analytic system is that the instructional conversation is goal directed. Any divergence in the flow of the conversation is a break in the flow of the unfolding lesson. All breaks in the flow, as defined by the Descriptive Analysis System, are representative of a conversational unit known as a Potentially Divergent Unit. All Potentially Divergent Units are thus structurally equivalent data sets. It is possible, therefore, to examine all instances of divergence and determine whether they are functionally, as well as structurally, equivalent. Consider a more concrete example. A teacher is involved in giving feedback to students regarding their gymnastics skills and suddenly turns to a group of students at the vaulting horse in a different part of the gym and warns them about "playing around" on the equipment. The instructional flow of the lesson was interrupted when the teacher stopped giving skill feedback and warned the students. The stream of conversation in which the teacher warned the students is frozen into a potentially divergent unit on the map. Since this unit was determined in a principled way (i.e., that all streams of conversation that do not directly follow the thread of the unfolding conversation are potentially divergent and, thus, are representative of the same class of phenomena), the researcher can look for patterns
within and across all potentially divergent units in the same and different lessons with the assurance that like entities or data sets are being compared. In addition, independent observers studying the potentially divergent unit above should give similar descriptions of what is occurring.

The discussion thus far in this Appendix has provided an overview of mapping, the specific methodology for capturing and freezing the instructional conversation for analysis and reflection. The remainder of the discussion focuses on the premises underlying the analytic system and the multi-step process used to construct and analyze the map of the instructional conversation of lesson.

**PREMISES OF THE ANALYSIS SYSTEM**

The premises identified below stem from the marriage of sociolinguistic and pedagogical concepts. These premises provide the theoretical basis for the systematic description of the instructional conversation as described in this Appendix.

1. Conversations are created by people acting on and working with the messages from and behavior of others;

2. Pedagogical actions on the part of student and teacher overlap conversational strategies, i.e., strategies such as focusing, confirming, and clarifying are at the same time pedagogical and conversational in nature;

3. The instructional conversation is goal directed;

4. The roles for teacher and student are specified;

5. The teacher determines the structure and direction of the conversation;
6. The structure of the conversation includes non-verbal and co-verbal aspects of the instructional chain;

7. The structure of the conversation may be tied to the students' interactions, the teacher's messages or the materials or topic central to the lesson;

8. A description of the instructional conversation must be obtained on a message by message basis;

9. Messages are context bound; therefore, interpretation of any part of the instructional conversation requires the consideration of the immediate context in which the aspect under consideration occurred;

10. Context is constructed as part of the evolving conversation; it is not merely background;

11. The contextualization cues to message realization, message boundary, and message ties (e.g., kinesics, proxemic, prosodic) used by participants are available to an observer;

12. Conversational relationships or ties exist between some messages in an instructional conversation but not between all messages;

13. Thematic and/or pedagogical cohesion exists on a variety of levels; therefore, consideration of the various levels of cohesion provides the basis for the identification of tied conversational units of varying length and type (Interaction Units; Instructional Sequence Units; Phase Units; Lesson Units);

14. Structural maps that symbolize the flow of the evolving conversation can be constructed using the conversational units identified;

15. Analysis of thematic cohesion and breaches in cohesion provide the basis for identification of instructional patterns and social action patterns (Green and Wallat, 1979, pp. 163-164).

In addition to the premises identified above, the premises listed below also contribute to the theoretical basis for the systematic
description of the instructional conversation. These premises are grounded in the nature of the gymnasium as a physically active environment.

16. Understanding the nature of teaching learning processes in physical education is facilitated when observation focuses on at least two major dimensions, and the interrelationships between them:
   a. the role of verbal communication in the development of meanings through face-to-face interaction between and among teacher and students; and
   b. the nature of students' participation in physical activity.

17. Much of the interaction between and among teacher and students in physical education is grounded in students' practice of physical activity. The construction of the structural map of the instructional conversation must thus reflect this characteristic of the learning environment.

18. Consideration of the various levels of thematic and/or pedagogical cohesion provides the basis for the identification of the Movement Task Unit and its three constituent sub-parts: Task Presentation Phase; Student Practice/Teacher Interaction Phase; and the Transition Phase, as well as the Interactive Episode.

MAPPING THE INSTRUCTIONAL CONVERSATION

The process of mapping the instructional conversation is primarily a three part process. These parts are:

1) transcription of the instructional conversation;

2) segmentation of the instructional conversation;

3) analysis of the instructional conversation.

Each of these parts is discussed below.
Transcription

The first step in mapping is to obtain a rough transcription of the instructional conversation between and among teacher and students from the videotape or audiotape of the lesson. The transcription should be as accurate as possible and inaudible portions should be designated as such in the transcript. All teacher talk is typed in upper case letters while student talk is typed in lower case letters (i.e., See Cochran-Smith, 1984; Ochs, 1979 for a discussion of the relationship of transcription and theory).

Segmentation

After the rough transcription is made, the second part of the mapping process involves segmenting the instructional conversation into the various hierarchical conversation and pedagogical units and placing them on the structural map of the lesson. The first unit in the hierarchy is the message unit.

Message Unit

The message unit (MU) is the smallest "unit of conversational meaning on the part of the speaker" (Green & Wallat, 1981, p. 196). Examples of message units are seen in Figure 20 transcript lines 061, 062, 063, 064 and so on. Though the Research Questions guiding the study did not necessitate this level of analysis, each MU, once identified, can be defined in terms of its source, form, purpose, level of comprehension, and tie (See Green, 1977; Green & Wallat, 1981 for a full discussion).
The segmentation of the conversation into message units occurs through a process of listening to and observing the cues to the delivery of a message. A message unit cannot be predicted in advance. It can only be determined on a post hoc basis (Green & Wallat, 1981, p. 164) by observing the nonverbal, verbal, and paralinguistic cues to the delivery of a message. These cues are cues to contextualization (Gumperz & Herasimchuk, 1973, Gumperz, 1982; Erickson & Shultz, 1981). To determine when a message begins and ends, the full range of contextualization cues must be considered (e.g., pitch, intonation, stress, pauses, head and arm gestures, head turning, and so forth). These cues signal the way in which messages are to be interpreted.

Once the segmentation of the rough transcription into message units is completed, the units are placed on the structural map. A segmented transcript was typed with each message unit beginning on a new line of type. Figure 20 shows message units by transcript lines (e.g., 061, 062, 063, 064, 065, 066). Teacher talk is in upper case letters and student talk is indented and in lower case letters, though there are no instances of student talk in this map segment.

After message units had been identified and a transcript text constructed, both transcript and videotape are used concurrently to identify on a post hoc basis other units of various types and lengths embedded within the conversation. These units are "based on a synthesis of previous research on conversational structure, conversational analysis, and the study of teaching" (Green & Wallat, 1981, p. 170). Identification of these units is possible due to the
conversation and thematic cohesiveness of the instructional conversation. The units are identified on a post hoc basis while simultaneously watching the videotaped record and listen to the audio.

Conversational cohesion occurs in conversations of all types (i.e., instructional and otherwise). That is, conversations are not a mixed bag of messages with a lack of coherence among these messages. By nature, conversations between and among individuals have a coherent or cohesive structure because they are goal oriented. Talk is used in conversation to reach some logical end or goal. Cohesiveness within a stream of conversation, as well as breaks in cohesion, permit identification of structures that function to maintain conversational cohesion. These structures are discussed below.

**Interaction Unit**

Conversational cohesion between message units is called an interaction unit (IU).

An interaction unit is defined as a series of conversationally tied message units. Which message units tie to form an interaction unit depends on consideration of verbal aspects of the message and cues to contextualization. If the delivery of a message indicates that more is to follow (e.g., the rhythm, pitch, intonation contour), then that message and the one that follows are described as tied. Conversational "pull" rather than syntax and/or semantic tie is the key. Consideration of contextualization cues is critical to the identification of which Message Units tie to form Interaction Units and which do not. (Green & Wallat, 1981, p. 200)
Examples of interaction units in Figure 20 are lines 061-062; 063-064; 066-067; 068; and 072-074. The map segment shows that an interaction unit is indicated by the bracket (I) and the horizontal line after the last message unit in the interaction unit.

Conversational cohesion is only one type of cohesion that occurs in the instructional conversation. One other type is thematic or topical cohesion. "All conversational units (i.e., message units, interaction units) that continue the flow or thread of the unfolding conversation are marked in the 'Thematically Tied Units' column" (Green & Wallat, 1981, p. 170)(See Figure 20; transcript lies 061-064 and 066-117).

Instructional Sequence Unit

Thematic cohesion across units can be considered across a number of hierarchical levels. This first level is cohesion across interaction units.

Cohesion across interaction units is called an Instructional Sequence Unit.

An instructional sequence unit (ISU) is composed of a series of tied interaction units (IU). An instructional sequence unit is defined in terms of content. All interaction units which focus on the same aspect of the total conversation belong to a single instructional sequence unit. The ties for the instructional sequence unit are ties that exist across units thematically. The end of an instructional sequence unit is marked by a shift in the general content within the lesson. Contextualization cues do not play a central role in the identification of instructional sequence units. This unit corresponds to a step the teacher takes in building the pedagogical structure of a lesson. An ISU is composed of interaction units, which focus on a single subcontent of the lesson. Like message units, the instructional sequence unit is determined only in retrospect. One
cannot determine in advance whether or not an
interaction unit will be part of the preceding
instructional sequence unit or will begin a new
instructional sequence unit. Instructional sequence
units are generally composed of more than one
interaction unit, but there are times in which an
instructional sequence unit will be composed of a
single interaction unit. (Green & Wallat, 1981, p. 201)

An example of an instructional sequence unit is shown in Figure 20,
transcript lines 061-077; 078-103; 104-109; and 110-117. The
instructional sequence unit is also indicated by a "double-barred
line at the end of the sequence and by the number in the upper left
hand box in the thematically tied units column on the map" (Green and

Not all conversation flows in a thematically cohesive way.
Whenever a break in cohesion occurs in an ISU that may
upset the pursuit of the teacher's apparent
instructional goal or theme, the break is called a
Potentially Divergent Unit (PDU). Any conversational
unit [i.e., message unit, interaction unit] that does
not directly follow the thread of the unfolding lesson
is placed in the PDU column on the instructional map.
(Graham, Green, Earls, in press)

An example of a Potentially Divergent Unit is shown in Figure 20,
transcript line 065. The manner in which the teacher maintains
thematic cohesion, as well as the manner in which breaks in cohesion
are handled, provides the cues to determination of rules of social
action in the instructional setting (Green & Wallat, 1981).
Phase Unit

Thematic cohesion also exists across instructional sequence units. In other words, each ISU is part of a larger unit called a Phase Unit.

A Phase Unit consists of a series of thematically tied Instructional Sequence Units. Pedagogically, a lesson is composed of parts or phases each with a distinct purpose (e.g., Introduction, Content Presentation, Evaluation Period or Summary). Consideration of the pedagogical and social structure being constructed will determine which Instructional Sequence Units belong to a Phase Unit and which do not. Consideration of who is group, when is group, and the expectations of behavior, provide the structural cues that can be used to determine Phase Units for a given period of time. While generally Phase Units are composed of more than one Instructional Sequence Unit, there will be instances when a Phase Unit will consist of a single Instructional Sequence Unit. Like all previously described units, the Phase Unit is determined in retrospect. (Green & Wallat, 1981, p. 201)

An example of a Phase Unit is shown in Figure 20, transcript lines 061-109. The map segment shows that the Phase Unit is marked on the map at the point of its terminating boundaries (i.e., transcript line 109). Message Unit 110 marks the beginning of a new Phase Unit.

The conversational and pedagogical units that are defined by the Descriptive Analysis System have been presented thus far. Described below is the additional analytic unit, the Movement Task Unit and its constituent subparts, that was inductively derived during the process of transcribing and segmenting the instructional conversation into message units for this study.
Movement Task Unit

The Movement Task Unit (MIU) was the basic organizational structure for conducting academic work in the physical education class. This pedagogical unit was an inductively derived unit of activity in which the interactions between and among teacher and students were of two basic types. First, there were interactions in which the teacher informed students of the expectations for practice of the movement task. Second, there were interactions that occurred simultaneously with student practice and focused primarily, though not entirely on that practice. In the latter, the interactions were driven primarily by students' practice of the movement task. The identification of this unit made it possible to maintain the integrity of the physical education class as both a communicatively active and physically active environment.

While the Movement Task Unit was the primary organizing structure for academic work, it was not, as suggested above, an undifferentiated structure. It minimally consisted of two parts or phases:

1) Movement Task Presentation Phase;
2) Student Practice/Teacher Interaction Phase.

A third and variable phase was identified in some, but not all, of the Movement Task Units:

3) Transition Phase.

Examples of Movement Task Units are shown in Figure 21, transcript lines 325-368. The map segment shows the MIU is marked by its number within the Phase Unit in the MIU column.
<table>
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<tr>
<th>Potentially Divergent Units (Non-Thematically Tied Units)</th>
<th>MTU No.</th>
<th>Transcript Line</th>
<th>IU</th>
<th>Thematically Tied Message Units</th>
<th>Int. Episode</th>
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</thead>
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<td>TASK PRESENTATION PHASE</td>
<td>2</td>
<td>325</td>
<td>15</td>
<td>YOU HAVE TWO CHOICES THIS TIME</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>326</td>
<td></td>
<td>1 ON 1 OR 2 ON 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>327</td>
<td></td>
<td>DECIDE WHAT YOU ARE GOING TO DO</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>328</td>
<td></td>
<td>IF YOU ARE GOING TO GET IN GROUP 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>329</td>
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<td>GET SEATED</td>
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<td>330</td>
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<td>331</td>
<td></td>
<td>RAISE YOUR HAND</td>
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<td></td>
<td></td>
<td>332</td>
<td></td>
<td>AND THEN I'LL TELL ONE PERSON TO</td>
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<td>333</td>
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<td>GO GET THE VOLLEYBALLS</td>
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<td>334</td>
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<td>IF YOU GET INTO A GROUP OF 2</td>
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<td>335</td>
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<td>AND YOU RAISE YOUR HAND</td>
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<td></td>
<td></td>
<td>THAT MEANS YOU ARE GOING TO PLAY</td>
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<td>1 AGAINST 1</td>
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<td>Questions</td>
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<td>ALLRIGHT</td>
<td>337</td>
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<td>WHEN I SAY GO</td>
<td>338</td>
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<tr>
<td>GET IN YOUR GROUP</td>
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<tr>
<td>SIT DOWN</td>
<td>340</td>
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<tr>
<td>AND RAISE YOUR HAND AND LET ME KNOW WHEN YOU ARE READY</td>
<td>341</td>
<td></td>
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<tr>
<td>GO</td>
<td>342</td>
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<td>are we allowed to play 4 on 4</td>
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<td></td>
<td></td>
<td></td>
<td>like we were yesterday</td>
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<td></td>
<td></td>
<td>344</td>
<td></td>
<td>I'LL TELL YOU</td>
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<td></td>
<td>345</td>
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<td>YOU GET IN A GROUP OF 8 AND THEN</td>
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<td></td>
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<td>I'LL TELL YOU</td>
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<td></td>
<td>346</td>
<td></td>
<td>YES I WILL</td>
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are we allowed to play 4 on 4 like we were yesterday
I'LL TELL YOU
YOU GET IN A GROUP OF 8 AND THEN I'LL TELL YOU
YES I WILL

my partner is absent
ARE YOU IN A GROUP AT ALL

RAISE YOUR HAND IF YOU ARE READY

I'M GOING TO TAKE CARE OF YOU IN JUST A MINUTE

WHEN I SAY GO
HAVE ONE PERSON GET A VOLLEYBALL

AND GET STARTED
READY GO

MAKE ONLY TWO HAND PASSES NOW

GOOD TWO HANDS NOW

WATCH THE CENTER LINE NOW
WATCH THE CENTER LINE
THAT'S A GOOD WATCH
LET IT GO IF IT'S GOING TO BE OF BOUNDS
<table>
<thead>
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<th>Page</th>
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<tr>
<td>2</td>
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<td>GET A VOLLEYBALL</td>
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<td></td>
<td>355</td>
<td>AND GET STARTED</td>
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<td>356</td>
<td>READY</td>
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<tr>
<td></td>
<td>357</td>
<td>GO</td>
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<td></td>
<td>23</td>
<td><strong>S PRACTICE/T INTERACTION PHASE</strong></td>
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<td>358</td>
<td>MAKE ONLY TWO HAND PASSES NOW</td>
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<td>24</td>
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<td>360</td>
<td>GOOD TWO HANDS NOW</td>
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<td>WATCH THE CENTER LINE NOW</td>
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<td>WATCH THE CENTER LINE</td>
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<td>363</td>
<td>THAT'S A GOOD WATCH</td>
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<td>364</td>
<td>LET IT GO IF IT'S GOING TO BE OF BOUNDS</td>
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<td></td>
<td>365</td>
<td>YOU CANNOT STEP OVER IT</td>
</tr>
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<td>26</td>
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<td></td>
<td>366</td>
<td>GET IN LINE WITH THE BALL</td>
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<td>367</td>
<td>GET IN LINE WITH THE BALL</td>
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<td></td>
<td>358</td>
<td>T BLOWS WHISTLE</td>
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<td>28</td>
<td><strong>TASK PRESENTATION PHASE</strong></td>
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<td></td>
<td>29</td>
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<tr>
<td></td>
<td>369</td>
<td>ALL RIGHT</td>
</tr>
<tr>
<td></td>
<td>370</td>
<td>WELL DONE</td>
</tr>
<tr>
<td></td>
<td>371</td>
<td>BUT YA KNOW WHAT</td>
</tr>
<tr>
<td></td>
<td>372</td>
<td>I WANNA SEE</td>
</tr>
<tr>
<td></td>
<td>373</td>
<td>I MEAN REALLY SEE</td>
</tr>
<tr>
<td></td>
<td>374</td>
<td>YOU GETTING BACK TO YOUR HOME BASE READY POSITION</td>
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<tr>
<td></td>
<td>375</td>
<td>THAT'S WHAT I'M LOOKING FOR</td>
</tr>
<tr>
<td></td>
<td>376</td>
<td>HOME BASE READY POSITION</td>
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<td></td>
<td>377</td>
<td>GO</td>
</tr>
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</table>
Movement Task Presentation Phase

The Movement Task Presentation Phase consists of a series of thematically tied Instructional Sequence Units during which the teacher explained, on a whole class basis, the expectations for the practice of physical activity. This Phase began immediately after the teacher blew the whistle to get students to stop practice of a movement task and ended when the teacher gave students the signal to begin practice again. Like all previously described units, this phase within the larger Movement Task Unit is determined in retrospect by both listening to and observing the videotaped record of lesson. An example of a Movement Task Presentation Phase is shown in Figure 21, transcript lines 325-357 and 369-377. The map segment shows this phase is marked by Task Presentation Phase in the Message Unit Column.

Student Practice/Teacher Interaction Phase

The Student Practice/Teacher Interaction Phase consists of a series of thematically tied Instructional Sequence Units during which students organized for practice, as well as became involved in the practice of physical activity. Simultaneous with each Student Practice Phase, the teacher engaged in interaction with students. These interactions focused primarily, though not entirely, on giving students' feedback relative to their motor skill performance. The teacher moved about the gym as students practiced and engaged in interaction with them as separate individuals, groups, and on a whole class basis. The interactions were primarily initiated by the
teacher and uni-directional in nature. This unit begins immediately after the teacher gives the signal to "Go" (i.e., organize for and begin practice) and terminates when the teacher blows the whistle as a signal to stop students' practice and in so doing, begin the Task Presentation Phase.

Like all previously described units, this phase within the larger Movement Task Unit is determined in retrospect by both listening to and observing the videotaped record of lesson. An example of the Student Practice/Teacher Interaction Phase is shown in Figure 21, transcript lines 358-368. The map segment show that the Practice Phase is marked by S Practice/T Interaction Phase in the message unit column.

Interactive episode. Given the nature of the interactions during this Student Practice Phase of the Movement Task Unit, that is, given that the intended target of the teacher's interactions was constantly changing as the teacher moved about the gym, it was necessary to create the interactive episode (cf. Corsaro, 1981) to "make sense" out of the ongoing interactions between and among teacher and students on the map. The interactive episode was a sequence of interactions in which the teacher provided information to a particular person or group of persons. When the intended target(s) of the interactions changed, a new episode began. Frequently, but not always, the change in the intended target of the interaction was signaled by the teacher's movement from the area in which the interaction had occurred. Thus, the episode began when either a
student(s) or teacher initiated the interaction and ended when the
person or persons who were the focus of these interactions changed.
In addition to the interactive episode helping to "make sense" of the
interactions occurring during the Student Practice Phase, the
identification of the interactive episode also made it possible to
conduct an analysis of the feedback given to students regarding their
motor skill performance.

As in the case of all the analytic units in this system, the
interactive episode is determined in retrospect by both listening to
and observing the videotaped record. An example of an interactive
episode is shown in Figure 21, transcript lines 358-359; 360;
361-365; 366-367; and 368. The map segment shows the episode is
marked in the Interactive Episode column by horizontal lines, as well
as by the target of the episode (i.e., the person/persons to whom the
interaction is directed: Class (C), Group (A) Individual/Public
(I/P); Individual/Private (I)).

Transition Phase

In addition to the Movement Task Presentation Phase and the
Student Practice/Teacher Interaction Phase, there was a third
variable phase in the Movement Task Unit - the Transition Phase.
This Phase consists of a series of thematically tied Instructional
Sequence Units during which the teacher gave students X amount of
time to get organized for practice. This phase begins when, at the
end of the Task Presentation Phase, the teacher gives the students
the signal to organize for practice. The phase ends when, at the end
of the allotted time for getting organized, the teacher gave the
signal to discontinue organizing and become attentive again. The
Transition Phase, when it occurred, came between the two stable
phases identified above. The Transition Phase primarily, though not
entirely, served a structuring or organizing function in preparation
for the practice of the movement task. This Phase was determined on
a post hoc basis by listening to and observing the videotaped
record. An example of a Transition Phase is shown in Figure 21,
transcript lines 343-357. The map segment shows that the Transition
Phase is marked by "Transition Phase" in the thematically tied
message unit column.

Cohesion Across Movement Task
Units to Form Phase Units

As explained previously, thematically tied Instructional Sequence
Units form Phase Units. Whenever during the lesson the Instructional
Sequence Units tie together to form one of the three phases of the
Movement Task Unit, then it is the Movement Task Units rather than
the Instructional Sequence Units, that thematically tie together to
form Phase Units. Thematic cohesion across Movement Task Units
exists when these Units are interrelated.

Movement Task Units were interrelated as a result of the manner
in which the teacher developed individual academic movement tasks
(Rink, 1979). That is, when what students were asked to do
motorically (i.e., the movement task) was essentially the same from
one task to the next and only the substantive intent or function of
the task varied (i.e., the informing, refining, extending, applying
function), the tasks were considered as linked or interrelated. These individual movement tasks are described as having a common major task. For example, when playing a two-on-two volleyball game (i.e., the major task) during one of the lessons, students were told in one Movement Task Unit to work on covering space defensively (i.e., a refining task). In the next Movement Task Units was the same (i.e., two on two) yet the substantive intent or function of the task varied (refining/extending). Whenever the major movement task that students were told to work on changed, for example, moving from two-on-two to four-on-four, a new lesson phase started.

An example of a Phase Unit formed by one or more interrelated Movement Task Units is shown in Figure 21. The map segment shows that the Phase Unit consists of two interrelated Movement Task Units (i.e., See MIU #2, beginning transcript line 325 and MIU #3, beginning transcript line 369).

The discussion of the mapping methodology thus far has focused on the construction of the map via the two stage process of transcription of the instructional conversation and segmentation of the instructional conversation. The third step in the mapping methodology, analysis of the structural map, is discussed briefly below.

**ANALYSIS OF THE STRUCTURAL MAP**

Once the map of the instructional conversation for a lesson was obtained, it was explored for recurring patterns of action and interaction in the physical education class. Once these recurring
patterns were extracted, variables grounded in the observed patterns were constructed. The variables were then tested across similar and dissimilar cases using the type-case analytic model (See Figure 3 Chapter III) (Erickson & Shultz, 1981; Green & Harker, 1982). A full description of the procedures for analyzing the structural maps is given in Chapter III for each Research Question that involved microanalysis of the instructional conversation.

TRUSTWORTHINESS OF THE ANALYTIC SYSTEM

Trustworthiness of the data was determined by obtaining interobserver agreement measures on researcher’s identification of the conversational and pedagogical units during the process of mapping. Specifically, interobserver agreement was determined on the following units in the hierarchy:

- Message Units;
- Movement Task Units;
- Task Presentation Phase;
- Student Practice/Teacher Interaction Phase; Also, interobserver agreement was determined on the Interactive Episode;
- Transition Phase;
- Phase Units (i.e., Phase Units based on thematically tied Movement Task Units).

These units were selected for determining interobserver agreement because they provided the basis for the presentation and discussion of findings in Chapters IV and V. To provide the reader an understanding of the process used to assess trustworthiness of the hierarchical units, the following dimensions of this process are discussed:
External Observers

The validation process was performed by External Observer D (i.e., see Chapter III, for a discussion on external observers). External Observer D conducted the validation process for all of the preceding units. Observer D was asked to serve as the external observer for these units because he was simultaneously engaged in dissertation research using the same system of microanalysis. No special training of the observer was necessary, therefore, beyond the definitions of the Movement Task Unit and the Unit's subparts.

Sampling for Interobserver Agreement; Method of Obtaining Interobserver Agreement

Interobserver Agreement on the researcher's identification of the designated units was conducted on a post hoc basis for a systematically selected sample of the units. Each sample is identified below, as well as the method for determining the level of agreement.

**Message Units**

Interobserver agreement was determined on all message units occurring during the first three minutes of the first and last Phase Units in Lessons 1 and 12 (i.e., The researcher had identified a total of 189 message units during these 12 minutes). Interobserver agreement was determined according to the the formula below:
An agreement was recorded each time the external observer recorded or designated a message unit the same as one of the researcher's 189 designated units. Disagreements were all message units in the sample of 189 for which agreement was not obtained. Interobserver agreement was calculated at 82% (i.e., agreement on 155 of 189).

**Movement Task Unit**

Interobserver agreement was determined for all Task Presentation Phases (n=19), Student Practice/Teacher Interaction Phases (n=19) and Transition Phases (n=5) in Lesson 1 and 8. Interobserver agreement was determined for each of the three phases according to the formula below:

\[
\text{Interobserver agreement} = \frac{\text{Number of Agreements}}{\text{Number of Agreements} + \text{Number of Disagreements}} \times 100
\]

An agreement was recorded each time the observer recorded or designated a phase within the Movement Task Unit the same as the researcher had designated the unit. Disagreements were all phases in the sample for which agreement was not obtained. Interobserver agreement was calculated at 100% for the Task Presentation Phase, Student Practice/Teacher Phase, and Transition Phase.
Interactive Episode

Interobserver agreement was determined for the first seven interactive episodes in Lessons 1, 2, 8, and 12 (n=28) Interobserver agreement was obtained via the formula identified below:

\[
\frac{\text{Number of Agreements}}{\text{Number of Agreements} + \text{Number of Disagreements}} \times 100
\]

An agreement was recorded each time the external observer recorded or designated an interactive episode the same as one of the researcher's 28 designated episodes. Disagreements were all interactive episodes in the sample for which agreement was not obtained. Interobserver agreement was calculated at 93% (26 agreements out of 28).

Phase Units

Interobserver agreement was determined for all Phase Units (n=4) based on thematically tied Movement Task Units in Lessons 2 and 12. Interobserver agreement was obtained using the formula identified below:

\[
\frac{\text{Number of Agreements}}{\text{Number of Agreements} + \text{Number of Disagreements}} \times 100
\]

An agreement was recorded each time the external observer recorded or designated a Phase Unit as consisting of the same Movement Task Units as the researcher. A disagreement was recorded for all Phase Units in the sample for which agreement was not obtained. Interobserver agreement was calculated at 100%.
Training of the External Observer

External Observer D

As indicated earlier, no special training beyond the description of the Movement Task Unit was necessary for External Observer to identify message units given his familiarity with the analytic system and underlying theoretical orientation.

Procedures for Conducting Validation

Procedures for obtaining interobserver agreement consisted of the basic steps identified below for each hierarchical unit, as well as interactive episode.

1) The observer was given an untreated copy of the rough transcription of the instructional conversation for the lessons designated in each sample (i.e., a transcript prior to segmentation into message units).

2) The researcher located for the observer the portion of the videotape where the identification of units was to be made.

3) Given the External Observer's familiarity with the system of analysis used in this study, the observer was very familiar with the use of the videotape recorder. The observer thus independently operated the VTR and stop/started/wound the tape as was necessary to identify the various units and mark them on the intreated transcription.

4) Once Steps 1-4 were completed, interobserver agreement was determined using the formula identified earlier.
Summary

The purpose of the Appendix was to describe the mapping methodology used in the study and the adapted Descriptive Analytic System upon which the methodology was based. As suggested by the preceding discussion of the interobserver agreement measures, and by the agreement scores in Table 41, the system is a highly reliable one that requires shared understanding between the researcher and the observer of the theoretical constructs underlying the system and the definitions of the hierarchical units contained in the system.
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<td>Transition Phase</td>
<td>100%</td>
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<tr>
<td>Interactive Episode</td>
<td>93%</td>
</tr>
<tr>
<td>Phase Units</td>
<td>100%</td>
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LIST OF REFERENCES


Erickson, F. (1986). Qualitative methods in research on teaching. In M.C. Wittrock (Ed.), Handbook of research on teaching (3rd ed.)(119-161). New York: Macmillan.


Pieron, M. (1980). From interaction analysis to research on teaching effectiveness: An overview of studies from the University of Liege. Paper presented at The Ohio State University.


Yerg, B. & Twardy, B. (1982). Relationship of specified instructional teacher behaviors to pupil gain on a motor skill task. In M. Pieron & J. Cheffers (Eds.), *Studying the teaching in physical education.* Liège (AteseP), 61-68.