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# A comparison of the Academic Learning Time-Physical Education of high- and low-skilled male and female collegiate lacrosse players

James Theodore Thomas

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A COMPARISON OF THE ACADEMIC LEARNING TIME-PHYSICAL EDUCATION  
OF HIGH- AND LOW-SKILLED MALE AND FEMALE  
COLLEGIATE LACROSSE PLAYERS

by

James Theodore Thomas

An Abstract

of a thesis submitted in partial fulfillment  
of the requirements for the degree of  
Master of Science in the School  
of Health, Physical Education,  
and Recreation at  
Ithaca College

September 1983

Thesis Advisor: Dr. Victor H. Mancini

## ABSTRACT

This study was conducted to compare the Academic Learning Time-Physical Education (ALT-PE) of high- and low-skilled male and female collegiate lacrosse players. Forty varsity lacrosse players, 20 males and 20 females, at the same college in the central New York area served as subjects. Each coach was asked to rank his/her players from high to low according to their ability. The top 10 ranked and bottom 10 ranked players on each team were selected for inclusion in this study. Each coach wore a wireless microphone and was videotaped along with his/her team 10 times during the 1981 season. The videotape of each practice was coded using the revised Academic Learning Time-Physical Education (ALT-PE) instrument of Siedentop, Tousignant, and Parker (1982). During the coding of each tape, three target players were selected to represent each group of subjects: high-skilled males, low-skilled males, high-skilled females, and low-skilled female lacrosse players. The target players were observed for an entire practice session on an alternating interval basis. Data obtained from these codings were compiled into percentages for all 21 ALT-PE categories. Visual analysis of the data revealed that there were few differences in the context levels of the players. However, significant differences were found in the learner involvement levels of the players, particularly the motor appropriate engaged time (ALT-PE). High-skilled males and females were motor engaged more,

accrued more ALT-PE, were engaged inappropriately less often, and had to wait less than their low-skilled teammates. High- and low-skilled male players spent more time in game play, were more engaged, and accrued more ALT-PE than their high- and low-skilled female counterparts. The results led to the rejection of all four major hypotheses which stated that: there would be no significant difference between the ALT-PE of high-skilled male and low-skilled male lacrosse players; there would be no significant difference between the ALT-PE of high-skilled female and low-skilled female lacrosse players; there would be no significant difference between the ALT-PE of high-skilled male and high-skilled female lacrosse players; and, there would be no significant difference between the ALT-PE of low-skilled male and low-skilled female lacrosse players.

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OF HIGH- AND LOW-SKILLED MALE AND FEMALE  
COLLEGIATE LACROSSE PLAYERS

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A Thesis Presented to the Faculty of  
the School of Health, Physical  
Education, and Recreation  
Ithaca College

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In Partial Fulfillment of the  
Requirements for the Degree  
Master of Science

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by  
James Theodore Thomas  
September 1983

Ithaca College  
School of Health, Physical Education, and Recreation  
Ithaca, New York

CERTIFICATE OF APPROVAL

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MASTER OF SCIENCE THESIS

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This is to certify that the Master of Science Thesis of

James Theodore Thomas

submitted in partial fulfillment of the requirements  
for the degree of Master of Science in the School of  
Health, Physical Education, and Recreation at Ithaca  
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## Chapter 1

### INTRODUCTION

In order to facilitate student achievement educators must not fail to recognize the fact that teachers often treat individuals differently based on their expectations of those individuals. A large body of educational research supports the contention that teachers are not, as a group, consistent in their interactions with students of various abilities (Brophy & Good, 1974).

In the realm of physical education, a number of studies have examined the expectations of teachers and coaches and the effects of expectations on students' behaviors. One means to examine the effects of differing expectations has been through the use of descriptive-analytic techniques. One widely used system has been Cheffers' Adaptation of the Flanders' Interaction Analysis System (CAFIAS) (Cheffers, 1972). CAFIAS, an interaction analysis system, described teachers' and students' behaviors and their interaction patterns. A modification of CAFIAS, the Dyadic Adaptation of the Cheffers' Adaptation of Flanders' Interaction Analysis System (DAC) (Martinek & Mancini, 1979) has been used to identify teachers' interactions with specific students. DAC has been used by Streeter (1980) and Reisenweaver (1980) to examine the behaviors exhibited by teachers as they related to high-skilled and low-skilled students in physical education classes. These

two studies were of virtually the same design except Streeter examined male teachers while Reisenweaver observed female instructors. Results indicated that high-skilled students received more praise, were asked more questions, were given more information, and initiated more interpretive behaviors than did the low-skilled students. The low-skilled students also received more criticism and gave more predictable responses.

DAC has also been used to identify coaches' interactions with specific athletes. Hoffman (1981) and Boyes (1981) examined lacrosse and football teams on the college level, respectively. Hoffman (1981) found significant differences in the interaction patterns of male and female lacrosse coaches with their high- and low-skilled athletes. Boyes (1981) found minimal differences in coaches' behaviors as they related to their starting and non-starting football players.

Another systematic observation instrument being used in physical education and athletics with increasing frequency has been the Academic Learning Time-Physical Education (ALT-PE) observation instrument (Siedentop, Birdwell, & Metzler, 1979; Siedentop, Tousignant, & Parker, 1982). ALT-PE, unlike interaction analysis, focused on student behaviors rather than teacher behaviors. ALT-PE has been shown to be a reliable indicator of teacher effectiveness and student learning (Siedentop et al., 1979). To date, few studies have been completed using the ALT-PE instrument to examine coaches' and athletes' behaviors. Rate (1981) observed the ALT-PE of athletes in five different sports during practice sessions.

Rate (1981) found that there were differences among the sports and that the ALT-PE of athletes was significantly higher than the ALT-PE of physical education students in the same schools. Galli (1982) examined the ALT-PE of high- and low-skilled basketball players. Galli found that low-skilled players tended to spend much time waiting and little time actively engaged in motor and cognitive situations when compared to high-skilled players.

Physical education literature reveals few studies where the effects of coaches' expectations on their athletes have been examined by the utilization of the ALT-PE instrument. This is the intent of the present investigation.

#### Scope of Problem

The ALT-PE of high- and low-skilled male and female collegiate varsity lacrosse players were investigated. Forty varsity lacrosse players, 20 male and 20 female, at the same college in the central New York area served as subjects. Ten sessions during the 1981 season were videotaped. Following the season, the coaches ranked their players from high to low according to overall playing ability. For this study the top 10 ranked players and the bottom 10 ranked players on each team were selected. During each practice session, three target players were selected to represent each group: high-skilled male players, low-skilled male players, high-skilled female players, and low-skilled female players. The target players were observed for an entire practice session on an alternating interval basis using the revised ALT-PE

observational system (Siedentop et al., 1982).

### Statement of Problem

The purpose of this study was to investigate the differences, if any, in the amount of ALT-PE experienced by high- and low-skilled male and female intercollegiate varsity lacrosse players.

### Major Hypotheses

The following major hypotheses were tested in this investigation:

1. There will be no significant difference between the ALT-PE of high-skilled male and low-skilled male collegiate lacrosse players..
2. There will be no significant difference between the ALT-PE of high-skilled female and low-skilled female collegiate lacrosse players.
3. There will be no significant difference between the ALT-PE of high-skilled male and high-skilled female collegiate lacrosse players.
4. There will be no significant difference between the ALT-PE of low-skilled male and low-skilled female collegiate lacrosse players.

### Assumptions of Study

The following assumptions were made for the purpose of the study:

1. The coding of 10 practice sessions of each team would be sufficient to yield valid data on the athletes' behaviors.

2. The target players that were chosen as subjects in each session were representative of their ability group.

3. The revised ALT-PE instrument provided a valid and accurate view of the athletes' involvement in the team setting.

#### Definition of Terms

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

1. Academic Learning Time (ALT) is the amount of time a student spends engaged in a relevant learning task with a high success rate (Marliave, Fisher, & Dishaw, 1972).

2. Academic Learning Time-Physical Education (ALT-PE) is the amount of time students spend in class activity engaged in relevant overt motor responding at a high success rate (Metzler, 1981).

3. Coach is the individual who directed and was primarily responsible for the men's or the women's varsity lacrosse team at the central New York college in this investigation.

4. Low-skilled Athlete is a player whose skill ability, as determined by his or her coach, placed him or her in the bottom 33% of the team.

5. High-skilled Athlete is a player whose skill ability, as determined by his or her coach, placed him or her in the top 33% of the team.

#### Delimitations of Study

The following were the delimitations of this study:

1. Two collegiate varsity lacrosse coaches, one male

and one female, from the central New York area were used for this study.

2. Forty collegiate lacrosse players, 10 high-skilled males, 10 low-skilled males, 10 high-skilled females, and 10 low-skilled females, from the central New York area were used in this study.

3. Each group of subjects was videotaped for 10 entire practice sessions.

4. ALT-PE was the only instrument used to record the group context level and the learner involvement level during the practice sessions.

#### Limitations of Study

The following were the limitations of this study:

1. The findings related to the context and learner involvement levels may be valid for comparison only when the ALT-PE instrument is used to identify involvement.

2. Because only one college was used, the findings may only be valid for the lacrosse players and their coaches at the involved college.

## Chapter 2

### REVIEW OF RELATED LITERATURE

Researchers have developed and used a variety of approaches to describe coaches, athletes, and their interactions. This chapter is devoted to a review of the literature surrounding this research and focuses on the following areas: (a) the observation of coaches and their athletes, (b) Academic Learning Time, (c) Academic Learning Time-Physical Education and its applications, and (d) summary.

#### The Observation of Coaches and Their Athletes

Research utilizing systematic observation of coaches and their athletes was not in evidence until the 1970's. Prior to this time many of the coaching studies were psychologically oriented and descriptive in nature. Lawther (1951), Gaylord (1967), Yeager (1964), Ogilvie and Tutko (1966), and Hendry (1968) all conducted studies which focused on describing traits and/or characteristics of coaches. Lawther (1951) and Gaylord (1967) discussed coaching in terms of teaching. Both viewed coaches as teachers whose professionalism and ideals should parallel those of other educators. Yeager (1964) described the attitudes displayed by successful coaches; these were a sense of humor, enthusiasm, and understanding. Ogilvie and Tutko (1966) found team coaches to be dominant and inflexible while Hendry (1968) discovered that swimmers

described their coaches as relaxed and trusting individuals.

Some investigators used questionnaires to study coaching behaviors. Penman, Hastad, and Cords (1974) studied the personalities of successful high school coaches. A questionnaire was used to determine the personality characteristics of 30 male football and basketball coaches. Most of the successful coaches were found to have authoritarian personalities. Danielson, Zelhart, and Drake (1975) examined the behaviors of hockey coaches as perceived by adolescent hockey players. They administered questionnaires to players ranging in age from 12 to 18 years old, who were attending a summer sports camp. Results indicated that most of the coaches' behaviors were perceived by the players to be communicative rather than dominating in nature.

Coaches' personalities were further examined by LaGrand (1971) and Hendry (1972). LaGrand (1971) used a semantic differential scale to examine coaches' behaviors as viewed by their athletes. Coaching behaviors were categorized by sport, and significant differences were found between sports. LaGrand concluded that many sports possessed or attracted certain personalities. Hendry (1972) investigated personality differences between coaches and physical education teachers through the use of a personality inventory. He found coaches to be more controlled and less flexible than physical education teachers.

To this date, many of the observations of coaches and their athletes were made through the use of questionnaires

and were frequently based on the perceptions of athletes. Percival (1974) pointed out the need for more systematic observation of coaches. While there was, after 1970, a substantial increase in research which utilized systematic observation to describe teaching behavior, particularly physical educators' behavior, few researchers have used these techniques to study coaches.

Not until Kasson (1975) were coaches' behaviors quantitatively analyzed through direct observation. The Mancuso Adaptation for Verbal and Nonverbal Behavior (Mancuso, 1973) was used to determine what differences existed between the behaviors physical educators exhibited while teaching and while coaching. Three educators at the university level were observed teaching and coaching their particular sport: gymnastics, baseball, or wrestling. Results indicated that the educators were as direct when they were coaching as when they were teaching. Nonverbal behavior was more evident in teaching while verbal behavior was predominant in coaching situations.

Tharp and Gallimore (1976) developed their own 10-category observational system and used it to analyze the coaching behaviors of UCLA's noted basketball coach, John Wooden. The researchers found that during practice over 50% of Coach Wooden's behaviors were instructionally oriented. Their findings suggested that his great success as a coach could probably be traced to these instructionally oriented practice sessions.

Another system, the Coaching Behavior Assessment System (CBAS) was developed by Smith, Smoll, and Hunt (1977). CBAS coded coaches' behaviors into two categories: reactive behaviors and spontaneous or game behaviors. Coaches of various sports were observed in practice, scrimmage, and game situations. The system proved to be the most effective with sports such as baseball because game development is readily predictable, and the source of the interaction can be readily identified. In sports such as hockey, basketball, and soccer the use of CBAS was difficult because the observer had problems in identifying the event to which the coach was responding. Crossman (1980) continued this line of research with the use of the Ohio State Athletic Observation Code (OSAOC) to observe the effects of intervention on athletes' behaviors. Practice sessions in wrestling, gymnastics, and volleyball were coded, and players were supplied with feedback. Such intervention proved effective in producing more positive practice behavior in both wrestlers and gymnasts, but not in volleyball players.

Several researchers (Agnew, 1977; Avery, 1978; Barr, 1978; Hirsch, 1978; Proulx, 1979; Rotsko, 1979; Staurowsky, 1979) utilized the Cheffers' Adaptation of Flanders' Interaction Analysis System (CAFIAS) (Cheffers, 1972) to describe coaching behavior. Agnew (1977) used CAFIAS to compare the behaviors of secondary female educators while teaching and while coaching. Twenty female educators were observed and their interactions with their students/players

were coded. The coaching behaviors on the whole were more productive than the behaviors exhibited in the teaching setting. Not only was the incidence of interaction greater in the coaching settings, but a greater variety of behaviors were exhibited. There was more athlete-initiated behavior and greater amounts of coach praise and acceptance. Barr (1978) used CAFIAS as an intervention technique with coaches. Following instruction and feedback utilizing CAFIAS, coaches showed an increase in questioning, praise, and acceptance. An increase in pupil-initiated behavior resulted as well.

Other instruments designed to measure other aspects of the coaching environment have been used by some researchers in conjunction with CAFIAS. Avery (1978) and Rotsko (1979) employed the Coaches' Performance Criteria Questionnaire (CPCQ) (Rosenshine & Furst, 1973) in conjunction with CAFIAS to investigate the coaching behaviors of effective and less effective coaches. Both studies revealed effective coaches used more indirect behaviors than less effective coaches. The Group Environmental Scale (GES), developed by Moos, Insel, and Humphrey (1974), was utilized by Hirsch (1978), Proulx (1979), and Staurowsky (1979). The GES enabled these researchers to make comparisons between the interactions of teams and their coaches in a satisfied environment and those in a less satisfied environment. Results indicated that coaches in satisfied environments had better control, provided more organization, and tended to be more supportive.

Hoffman (1981) utilized the Dyadic Adaptation of CAFIAS (DAC) (Martinek & Mancini, 1979) to describe the coaching behaviors of male and female lacrosse coaches toward their low-skilled and high-skilled athletes. He found that both coaches interacted with these skill groups differently. The male coach was direct and critical in his interactions with his low-skilled athletes, and informative and supportive in his interactions with his high-skilled players. The female coach exhibited similar behaviors as the male coach in her interactions with her high-skilled players. However, in contrast to the male coach, she was more supportive of her low-skilled players' efforts and actions.

Boyes (1981) utilized DAC to investigate the interaction patterns of NCAA Division III college football coaches with their starting and non-starting players. Results indicated that there were minor differences in coaches' behaviors toward the starters and the non-starters. Starting players received more praise and acceptance while the non-starting players received more directions from their coaches. Also, non-starters' behaviors were more predictable and less interpretive than those of the starting players.

An instrument which recently has been used for the observation of coaches and their athletes is Academic Learning Time-Physical Education (ALT-PE) (Siedentop, Birdwell, & Metzler, 1979; Siedentop, Tousignant, & Parker, 1982). It is the observational tool which is employed in this study. In order to properly understand ALT-PE, it is necessary to

briefly examine the research surrounding its precursor, Academic Learning Time. Academic Learning Time was not developed to observe physical educators and coaches, but for use in describing teaching and student activity in elementary classrooms.

#### Academic Learning Time

Carroll (1963) contended that the degree to which a student was involved in learning, as measured by time, was one of the most influential factors in creating favorable learning environments. The Far West Laboratory for Research and Development in the 1970's sponsored a series of studies which investigated Carroll's assertion. This body of research was known as the Beginning Teacher Evaluation Study or BTES.

In one of the initial BTES studies Marliave, Fisher, and Dishaw (1972) developed the observational tool Academic Learning Time (ALT) for studying classroom environments. ALT was defined as the amount of time a student spends engaged in a relevant learning task with a high success rate (Marliave, Fisher, & Dishaw, 1972). ALT was initially used to monitor teacher and student behavior in elementary reading and math classes.

BTES research identified four instructional variables related to ALT: allocated time (the time provided for learning a task), engaged time (the percentage of allocated time students spent actively responding), task relevancy (the degree to which an activity can be viewed as contributing to an academic goal), and success rate for the engaged task

(Marliave, 1977). These variables have become important parts of educational research (Caldwell, Huitt, & Graeber, 1982).

The ALT instrument has found limited application in classroom research. Two studies which have used ALT were conducted by Marliave (1979) and Ortiz (1980). Marliave (1979) studied the relationship between ALT and achievement. In his study ALT was measured by teacher and coder observations during learning periods. Achievement tests were then administered to the 122 fifth graders and 139 second graders involved. Areas of study were limited to reading and math. Data provided evidence of a strong positive relationship between ALT and levels of student learning.

Ortiz (1980) utilized the ALT instrument to observe a bilingual educational program in California. Her research revealed that pupil interaction was significantly reduced for bilingual students when bilingual aides were present. She found that the teachers and the aides were often working against each other. This resulted in reduced ALT and classroom management problems. She concluded that a new approach to using bilingual aides should be considered.

Although the ALT instrument has not been used extensively in the description of classroom environments, it has been modified for use in physical education and coaching settings.

Academic Learning Time-Physical Education  
and its Applications

ALT was modified for use in physical education by

Siedentop et al. (1979). Through their work at Ohio State University, the Academic Learning Time-Physical Education (ALT-PE) observational system was developed. The intent of ALT-PE was to observe participation levels of physical education students in respect to the context of the class and the difficulty of the activity. There were four major category decisions: setting (instructional style), content (general or physical education related), learner move (engaged or not-engaged), and difficulty (easy or not easy). The use of a 12-second interval recording format was added. In this format, the subject is observed for 6 seconds, and the coder records for the next 6 seconds. ALT-PE was defined as the amount of time a student spends engaged in physical education tasks at an easy level of difficulty (Siedentop et al., 1979). The original ALT-PE system was revised by Siedentop et al. in 1982 to make the instrument easier to use. Most studies to date have used the original system. The present investigation used the revised system.

The ALT-PE instrument has been used by several researchers to describe elementary physical education classes. Shute, Dodds, Placek, Rife, and Silverman (1982) examined the ALT-PE of a large number of students in one instructor's elementary movement education classes. One hundred and five elementary students in 20 classes were observed. Differences in ALT-PE between boys and girls, special and non-special need groups, and between high-, medium-, and low-skill levels were investigated. Shute et al. (1982) found there were no

significant differences in the teacher's treatment of boys and girls as evidenced by their respective ALT-PE. The teacher was also able to involve her special needs children and her students of varying skill levels to similar degrees. Shute et al. (1982) concluded that the teacher in question was able to equalize the learning opportunities for every child.

Aufderheide, McKenzie, and Knowles (1982) compared the ALT-PE of regular and mainstreamed handicapped elementary students. In addition, they employed the Level of Use interview technique to determine if teachers were using individual individualized instruction and, if so, what the effects were on the ALT-PE of their students. Fifteen instructors were classified as Users of individualized instruction and 15 as Non-users. Findings indicated that Users provided a significantly greater amount of ALT-PE for their students, whether they were regular or mainstreamed. Students of Users were engaged 57.2% of the time while Non-users' students were engaged 48.9% of the time. It was suggested that inservice courses be provided for the development and improvement of individualized instruction techniques.

McKenzie (1980) described the ALT-PE of elementary-aged swimmers. The 5- to 7-year old subjects were divided into low-, medium-, and high-ability groups through the use of a pretest. A target child was selected from each group for observation. The effects of publicly posting skill achievement on the ALT-PE of the children were observed. Additionally,

two disruptive children were observed and the effects of 1-minute "time out" contingencies on their behaviors and their ALT-PE were examined. Results showed significant increases in the ALT-PE of half the swimmers whose achievements were publicly posted. The target subjects raised their ALT-PE(M) from 13.5% to 25.8% and from 8% to 20.8%, respectively, as a result of the postings. Also, the disruption caused by the two subjects decreased as a result of the "time out" contingencies.

Some researchers have compared the ALT-PE of secondary and elementary students. Metzler (1980a) examined the ALT-PE levels of students, grades 1-12. Students of 21 inservice physical education instructors were videotaped. Findings indicated that students were engaged in content-PE 73.6% of the time, and ALT-PE occurred in 26.8% of all observed class intervals. Descriptive statistics were used to analyze the data, and analysis revealed a "funneling effect" which indicated a reduction in ALT-PE with an increase in the level of task difficulty. Metzler (1980b) examined the levels of ALT-PE accrued by students in various physical education settings. Results revealed that different sports such as volleyball, football, soccer, and gymnastics had different amounts of ALT-PE associated with them. Students engaged in the volleyball and soccer activities exhibited the highest mean ALT-PE percentages (59.4% and 40.3%, respectively) while the lowest mean ALT-PE levels were observed in football and gymnastics activities (14.1% and 12.3%, respectively). These

results indicated that students engaged in team activities tended to accrue more ALT-PE than did students engaged in individual activities. In addition, Metzler (1980b) found that ALT-PE did not increase as the teaching units progressed.

Metzler (1981) also examined the ALT-PE of college students. The results indicated that 45% of all coded intervals were ALT-PE. This was nearly twice the amount of ALT-PE that had been exhibited in his grade 1-12 study and, as expected, indicated a substantially higher level of involvement on the part of the college students.

The amount of ALT-PE experienced by secondary and elementary students in regular physical education classes was investigated by Godbout, Brunelle, and Tousignant (1983). Thirty elementary and 31 secondary students were observed in regular physical education classes, and their ALT-PE was recorded. Results indicated that there was more ALT-PE experienced by the secondary students. Content-PE time accounted for 65.7% of the class time in the elementary classes and 81.1% in the secondary classes. Secondary students averaged 36.4% of the class time in ALT-PE while elementary students averaged 31.3%. Godbout et al. concluded that less time was spent waiting, managing, and resting in the secondary classes, and, therefore, more time was available for physical activity.

Young (1981) and McKenzie, Clark, and McKenzie (1982) observed the ALT-PE of students when different instructional strategies were utilized by their teachers. Young (1981)

used ALT-PE to assess the acquisition of a novel skill by students. She sought to reduce the influence of prior motor learning by utilizing Experimental Teaching Units (ETU). An ETU is a specified novel skill or content area to be taught in a specific amount of time, but the teacher may teach the ETU using any instructional strategy he/she chooses. Ninety elementary students performed a combined golf/hockey skill which involved hitting a ball into a hoop placed 30 yards away. They were then observed using ALT-PE during the 20-minute ETU's. Pretest and posttest scores showed that prior motor ability in the skill was not related to subsequent achievement and that increased ALT-PE was correlated with higher posttest scores.

McKenzie et al. (1982) used six different instructional strategies to teach skills in beginning fencing classes. Three randomly selected students were observed, and their behaviors were coded by experienced ALT-PE coders. The same experienced instructor taught all of the classes and was naive to the objectives of the study. The results indicated that different styles of teaching exhibited different "freeing effects." In some styles of teaching, the instructor was able to provide more feedback during the course of the activity, because she had been freed from sedentary, directive behaviors. For example, when the teacher was required to "drill" students on fencing techniques during the activity, students received feedback 25.4% of the time. When drilling was machine-paced or student-directed, the instructor was free to provide

feedback and the students received feedback during 51% of the observed intervals. McKenzie et al. (1982) concluded that teaching strategies that allowed more feedback while maintaining high levels of ALT-PE were valuable.

Several studies have examined the effects of different interventions on teaching. Whaley (1980) and Paese (1982) studied the effects of feedback on the ALT-PE of secondary students. Whaley (1980) investigated the manner in which daily monitoring and graphic feedback affected ALT-PE in secondary school settings. Experienced inservice teachers at four secondary schools near Columbus, Ohio were observed daily for 7 weeks. Their classes were videotaped and coded by trained observers. Both teachers and students received graphic feedback using video-replay following each session. Whaley's (1980) results showed that graphic feedback had no effect on the amount of the motor response or engaged time of the students, as indicated by their ALT-PE.

Paese (1982) assessed how feedback affected the teaching behaviors of two student teachers. After their secondary physical education classes were observed and coded, the teachers were supplied with written and verbal feedback which reflected the ALT-PE data. The results clearly indicated the positive value of feedback to improve instruction. The teachers' management time decreased while their students exhibited an increase in class activity. Also, ALT-PE and engaged motor responses increased nearly 150% from pre-intervention levels.

Birdwell (1980), at Ohio State, chose to study how specific instructions and feedback for teachers altered the ALT-PE of selected students in their classes. One elementary, one junior high, and one high school teacher were asked to participate. They all attended a clinic which was designed to help improve teaching behaviors. Results showed that there was a significant association between changes in teacher behaviors and increased levels of student ALT-PE. These behavioral changes included decreases in teacher management time, increases in feedback to students, and the ability to reduce student nonengaged time.

Wurzer (1982) studied three university educators and their volleyball classes over a 15-week period. Three different instructional interventions or packages were introduced in an effort to examine their effects on the ALT-PE of the students. The packages were designed to change management time, feedback, and student nonengagement. Decreases in management time and student nonengaged time and increases in feedback were all associated with significant increases in student ALT-PE. Wurzer concluded the packages were able to produce changes in teachers' and students' behaviors and were valuable instructional intervention tools.

Rate (1981) observed 46 athletic teams during practice sessions in an effort to compare the ALT-PE of athletes in different sports. The ALT-PE of physical education students in the same, central Ohio area were also compared. Five different sports were represented: basketball, wrestling,

gymnastics, tennis, and baseball. Results indicated that:

(a) nearly 75% of all content-PE was skill practice or scrimmage, (b) the athletes were engaged for nearly 60% of all content-PE time, (c) the average amount of ALT-PE for all sports was 49.3%, (d) coaches spent approximately equal amounts of time in instruction, management, and silent monitoring, (e) 75% of all instruction was direct, (f) significant differences in ALT-PE existed between wrestlers and tennis players, and (g) large but not statistically significant differences were found between wrestlers and gymnasts. The average of nearly 50% ALT-PE across all practice sessions was significantly higher than the ALT-PE accrued by physical education students in the same schools. Rate (1981) attributed the higher ALT-PE of athletes to increased motivation, advanced management techniques of coaches, the use of scrimmage techniques, and the greater availability of equipment.

Pieron (1982) and Galli (1982) employed the ALT-PE instrument to study the effects of teacher/coach expectations on learner involvement. Pieron (1982) compared the ALT-PE of high- and low-achievers in gymnastics and volleyball activities. He found that high-achievers accrued significantly higher amounts of the time-on-task and success rate variables than did low-achievers in both activities. In addition, the data indicated that instructors tended to provide feedback to low-achievers more frequently than they did to their high-achievers. In spite of this additional feedback, the

performance gap between the two ability groups was expected to widen because of the higher success rates and greater time-on-task experienced by the high-achievers.

Galli (1982) conducted a study which examined the differences in ALT-PE between high-skilled and low-skilled male high school basketball players. An N = 1 design was utilized in which a single subject from each ability group was observed for an entire practice session. Twenty practice sessions in all were videotaped: five before the first game, five after wins, five after losses, and five while the team was preparing for postseason competition. Galli found that there were noticeable differences between the ALT-PE of the high-skilled and the low-skilled players. The low-skilled player accrued an average of 30.8% ALT-PE versus 34.4% for the high-skilled player during the same practice sessions. His results indicated that the low-skilled player spent more time waiting to participate and was less actively involved in motor and cognitive situations.

#### Summary

The early research on coaches and their athletes were mostly descriptive studies which focused on describing coaches' personalities and attitudes. Gaylord (1967), Hendry (1968), Lawther (1951), Ogilvie and Tutko (1966), and Yeager (1964) all examined the personalities and attitudes of individuals in coaching. Coaches were described as being enthusiastic, humorous, and understanding on the one hand and dominant and inflexible on the other. Danielson et al. (1975)

and Penman et al. (1974) supported these findings. Hendry (1972) and LaGrand (1971) used a personality inventory and a semantic differential scale to examine coaches' personalities. The use of these tools to study coaches and their athletes was indicative of the systematic research which more and more researchers were conducting.

After 1970 the systematic observation of teaching increased substantially, and some researchers began to utilize similar techniques to observe coaches and their athletes. Kasson (1975) analyzed the behaviors of teacher/coaches by the Mancuso Adaptation for Verbal and Nonverbal Behavior (Mancuso, 1973). Results indicated a tendency for educators to be more verbally oriented when acting as coaches than when acting as teachers. Tharp and Gallimore (1976), Smith et al. (1977), and Crossman (1980) also employed systematic techniques to assess the behaviors of coaches and their athletes.

A large group of studies employed Cheffers' Adaptation of the Flanders' Interaction Analysis System or CAFIAS to observe coaching behaviors. Agnew (1977), Avery (1978), Barr (1978), Hirsch (1978), Proulx (1979), Rotsko (1979), Staurowsky (1979), Hoffman (1981), and Boyes (1981) utilized CAFIAS or its modification, DAC, in various contexts which contributed greatly to coaching literature.

With the conceptualization of Academic Learning Time (ALT) by the researchers of the Far West Laboratory for Research and Development, a new observational system, ALT, was made available. At first it was used solely in the

classroom (Marliave et al., 1972; Marliave, 1979; Ortiz, 1980). Siedentop et al. (1979) modified the ALT observation instrument for use in physical education. This modification, ALT-PE, has been utilized to observe the involvement levels of students and athletes in several studies.

Shute et al. (1982) used ALT-PE to determine how one teacher dealt with various groups of students. Aufderheide et al. (1982) reviewed the effects of individualized instruction on the ALT-PE of handicapped elementary students, and McKenzie (1980) described the ALT-PE of 5- to 7-year old swimmers.

Metzler (1980a) and Godbout et al. (1983) compared the ALT-PE of elementary and secondary students. Metzler (1981) studied the ALT-PE of college students and compared the results to the ALT-PE accrued by elementary and secondary students. As expected, older, more mature students tended to waste less class time and generally exhibited higher ALT-PE levels. Metzler (1980b) examined students' ALT-PE in several different sports activities.

Young (1981) and McKenzie et al. (1982) observed the ALT-PE accrued by students when their teachers employed various instructional strategies. Whaley (1980), Birdwell (1980), Paese (1982), and Wurzer (1982) tried to alter teaching behaviors through various intervention strategies. Generally, the use of strategies which allowed for more teacher feedback and resulted in increased ALT-PE levels were supported. Rate (1981) examined athletes' ALT-PE during the

practice sessions of five different high school sports.

Pieron (1982) and Galli (1982) utilized ALT-PE to study high- and low-skilled individuals. Pieron observed high- and low-achievers in gymnastics and volleyball activities while Galli compared the ALT-PE of high- and low-skilled basketball players.

All of the recent research with the ALT-PE instrument indicates that it is a viable, useful tool for the observation of teachers and coaches. The amount of accrued ALT-PE has been used as an indicator of teacher/coach effectiveness and student/athlete achievement.

## Chapter 3

### METHODS AND PROCEDURES

This chapter describes the selection of subjects, the testing instrument, the method for establishment of interobserver agreement, the procedures, the methods of data collection, the scoring of data, and the treatment of data or the statistical procedures utilized in this investigation. A summary of the methods and procedures utilized is also included.

#### Selection of Subjects

The subjects in this investigation were 40 varsity lacrosse players, 20 male and 20 female, at the same central New York college. The players' coaches, one male and one female, gave the investigator permission to videotape their teams' practice sessions (Appendix A). Each athlete's permission to participate in the investigation was obtained by the use of an informed consent form (Appendix B). The coaches ranked their players from high to low according to overall playing ability. The top 10 ranked and the bottom 10 ranked players on each team were selected for inclusion in this investigation.

#### Testing Instrument

The revised ALT-PE systematic observation system (Siedentop, Tousignant, & Parker, 1982) was used to code the videotapes (Appendix C). The ALT-PE instrument uses a group-

focused context decision and an individually-focused learner decision format. There are three major subdivisions at the context level (general content, subject matter knowledge, subject matter motor) and two major subdivisions at the learner involvement level (not motor engaged and motor engaged). There are 13 categories within the sub-divisions of the context level that describe the nature of the class environment and eight categories within the learner involvement level that describe individual student behavior. In this investigation the interval recording technique was used with a 6-second observe, 6-second record format.

#### Interobserver Agreement

Training for coding of ALT-PE consisted of an introduction and thorough examination of the revised ALT-PE coding manual (Siedentop et al., 1982), learning of the ALT-PE categories and the method of using the coding sheet, and five practice coding sessions using videotapes.

Following the training period and practice sessions, interobserver agreement (IOA) for this investigation was assessed using the scored-interval agreement method (Hawkins & Dotson, 1975). Four randomly selected videotapes, two of the male lacrosse team's practices and two of the female lacrosse team's practices, were coded simultaneously by Dr. Victor H. Mancini, an expert in descriptive-analytic techniques, and the investigator. IOA was calculated on an interval-by-interval basis and was computed by dividing the number of intervals on which there was agreement by the number

of agreements plus disagreements and multiplying the results by 100 (Herson & Barlow, 1976). The formula is given below:

$$\frac{\text{Agreements}}{\text{Agreements} + \text{Disagreements}} \times 100 = \% \text{ of agreement or IOA.}$$

The observers were determined to be in agreement when both observers recorded the target behavior as occurring during the interval. When the observers did not concur, the observers were considered to be in disagreement.

#### Procedure

Each player in this study was videotaped with his or her knowledge and consent during 10 team practice sessions. The coaches wore wireless microphones which allowed them to move freely as they coached.

At the end of the season the coaches ranked their players from high to low according to overall playing ability. For this study the top 10 ranked players and the bottom 10 ranked players on each team were selected.

The videotapes were coded using the ALT-PE instrument by an expert coder, Dr. Victor H. Mancini, and the investigator. During the coding of each practice session, three target players were selected to represent each group: high-skilled male players, low-skilled male players, high-skilled female players, and low-skilled female players. The target players within each group were observed for an entire practice session on an alternating interval basis, using a 6-second observe, 6-second record coding format. A programmed cassette was used to provide verbal cues to observe and record.

### Method of Data Collection

Data for final analysis were obtained from the coding of 10 videotapes of each team's practice sessions. The videotapes were coded by the investigator and Dr. Victor H. Mancini using the ALT-PE system.

### Scoring of Data

The data were scored manually and percentages and ratios for the 21 variables identified by ALT-PE were calculated.

### Treatment of Data

Descriptive statistics were used to determine differences in ALT-PE between male and female high- and low-skilled players during their respective practice sessions.

### Summary

The subjects in this study were 40 varsity lacrosse players at the collegiate level, 20 male and 20 female, from a central New York college. They were randomly selected from a high-skilled or low-skilled group, as determined by their coaches. Ten practice sessions were videotaped during the same season.

Data for analysis were obtained from the coding of the videotapes by the investigator and Dr. Victor H. Mancini using the revised ALT-PE system. During coding of practices, three players were randomly selected to represent each group of athletes during their respective practice sessions: high-skilled males, low-skilled males, high-skilled females, and low-skilled females. The data were scored manually and percentages and ratios for the 21 ALT-PE variables were

calculated. Descriptive statistics were used to determine differences between high- and low-skilled male and female players.

## Chapter 4

### ANALYSIS OF DATA

The results obtained from the comparison of the Academic Learning Time-Physical Education (ALT-PE) of high- and low-skilled male and female collegiate lacrosse players are presented in this chapter. The revised ALT-PE instrument of Siedentop, Tousignant, and Parker (1982) was used to describe the context levels and learner involvement levels of the players. This chapter is divided into the following sections: (a) interobserver agreement, (b) analysis of the data, and (c) summary.

#### Interobserver Agreement

Interobserver agreement (IOA) scores were computed using the scored-interval method (Hawkins & Dotson, 1975). Four randomly selected videotapes, two each from the male and female lacrosse teams' practices, were coded simultaneously by Dr. Victor H. Mancini, an expert in descriptive-analytic studies, and the investigator. IOA scores ranged from 87.0% to 100% which were sufficient to indicate the coders were reliable (Appendix D).

#### Analysis of Data

Percentages were calculated manually for all ALT-PE categories for high- and low-skilled male and female lacrosse players. These calculations were obtained from 3,138 observation intervals of the female lacrosse team's practices

and 3,463 observation intervals of the male lacrosse team's practice sessions. Female lacrosse team practices averaged 62.3 minutes in length while the male lacrosse practices lasted an average of 69.2 minutes.

Visual inspection of the data in Table 1 revealed little difference in the context levels of high- and low-skilled male players, but marked differences were found in the learner involvement levels of these two groups. The amount of time high- and low-skilled male players were involved in various context level activities was similar. Regardless of their ability level, the male lacrosse players spent 25.27% of their time performing general activities. Approximately 14% of this time was devoted to executing warm-up activities. The players were in transition approximately 9% of the time and were involved in performing managerial tasks about 2% of the time. The players received no break or rest period during practice. The coach spent approximately 16% of practice time relating knowledge to his players. Approximately 9% of the time was spent discussing strategy with the team. The players received some information about skill technique (approximately 3.5%) and some background information (approximately 2%) as well. Little time was spent reviewing the rules, and no time was devoted to discussing appropriate social behavior. Approximately 60% of the practice sessions were spent in subject matter motor activity--performing lacrosse skills and playing. The players were engaged in skill practice and drills approximately 26% of the time and spent approximately

Table 1  
 Percent Occurrence of ALT-PE Categories for  
 High- and Low-skilled Players

ALT-PE Categories	High-skilled	Low-skilled
General Content	25.27	25.27
Transition	9.13	8.96
Management	1.76	1.93
Break	.00	.00
Warm-up	14.38	14.38
Subject Matter Knowledge	15.68	15.76
Technique	3.49	3.55
Strategy	9.41	9.42
Rules	.78	.84
Social Behavior	.00	.00
Background	1.99	1.96
Subject Matter Motor	59.05	58.97
Skill Practice	26.48	26.65
Scrimmage/Routine	22.93	22.75
Game	9.64	9.58
Fitness	.00	.00

Table 1 (continued)

ALT-PE Categories	High-skilled	Low-skilled
Not Engaged	48.02	54.29
Interim	.98	1.53
Waiting	3.41	9.27
Off-task	.06	.20
On-task	19.43	20.10
Cognitive	24.14	23.19
Motor Engaged	51.98	45.71
Motor Appropriate	38.38	24.28
Motor Inappropriate	13.37	20.45
Supporting	.23	.98

23% of their time in scrimmages. Ten percent of practice time was devoted to game play. No time was spent on fitness during practice.

Noticeable differences were found in the learner involvement levels of high- and low-skilled male lacrosse players (Table 1). The low-skilled players were inactive or not engaged more often than the high-skilled players (54.29% versus 48.02%). The greatest difference was in the time spent waiting. The low-skilled players spent nearly three times as much time waiting as did the high-skilled players (3.41% for the high-skilled players versus 9.27% for the low-skilled players). Both high- and low-skilled male athletes received similar amounts of information from their coaches (24.14% for the high-skilled players versus 23.19% for the low-skilled players) and spent a similar amount of time performing on-task activities (19.43% for the high-skilled players versus 20.10% for the low-skilled players). Both the high- and low-skilled players exhibited few off-task and interim behaviors.

The high-skilled players were engaged in motor activity 6.27% more of the time than the low-skilled players; the high-skilled players were actively participating 51.98% of the time compared to 45.71% of the time for the low-skilled players. The high-skilled players were appropriately engaged (ALT-PE) 38.38% of the time compared to 24.28% of the time for the low-skilled players. The low-skilled players were not appropriately engaged or unsuccessful in the performance of

motor skills 20.45% of the time compared to 13.37% of the time for the high-skilled players. Little motor supporting behavior was evident. These results led to the rejection of the first major hypothesis which stated that there would be no significant difference between the ALT-PE of high-skilled male and low-skilled male collegiate lacrosse players.

Visual inspection of the data shown in Table 2 revealed little difference in the context levels of high- and low-skilled female players, but significant differences were found in the learner involvement levels of these two groups. The amount of time spent by high- and low-skilled female players in various context level activities was similar. Both groups spent about 27% of their practice time performing general activities. The majority of this time was devoted to warm-up activity (approximately 16%). Approximately 8% of the time was spent in transition while about 3% of the players' time was devoted to managerial tasks. The players received no break time during practice. The coach spent approximately 16.5% of practice time relating knowledge to her players. Much of this time was devoted to discussing strategy (approximately 8%) and technique (5.51%). Little time was spent by the female coach discussing rules, background information, or social behavior with her high- and low-skilled athletes. Approximately 60% of the practice time was spent in subject matter motor activity. The female players spent about 32% of their time in skill practice or drills and approximately 23% of the time in scrimmage or

routine situations. Game play activity occurred 1.72% of the time, and no time was spent on fitness during practice sessions.

Significant differences were evident between the learner involvement levels of high-skilled and low-skilled female lacrosse players (see Table 2). The high-skilled players were not engaged 53.95% of the time while low-skilled females were not engaged 59.59% of the practice time. This difference was due primarily to the time the players spent waiting. The low-skilled players waited much more than the high-skilled players (9.40% versus 4.65%). The female coach gave similar amounts of information to her high- and low-skilled athletes (approximately 26%), and both the high- and low-skilled players spent a similar amount of time (approximately 22.5%) performing on-task activities. Little interim and off-task behavior was recorded for both groups.

The low-skilled players were engaged in motor activity less than the high-skilled players (40.41% versus 46.05%). The largest difference was in the time spent appropriately engaged (ALT-PE). High-skilled females accrued 33.65% ALT-PE while low-skilled females accrued significantly less (21.41%). Low-skilled players spent more time inappropriately engaged (15.72% versus 11.15%). Little time was spent by high- and low-skilled female players in motor supporting behavior. These results led to the rejection of the second major hypothesis which stated that there would be no significant difference between the ALT-PE of high-skilled female and low-skilled female collegiate lacrosse players. The percent

Table 2  
 Percent Occurrence of ALT-PE Categories for  
 High- and Low-skilled Female Players

ALT-PE Categories	High-skilled	Low-skilled
General Content	26.80	26.83
Transition	7.97	7.97
Management	2.77	2.77
Break	.00	.00
Warm-up	16.06	16.09
Subject Matter Knowledge	16.22	16.50
Technique	5.51	5.51
Strategy	7.81	8.06
Rules	.89	.86
Social Behavior	.38	.38
Background	1.63	1.69
Subject Matter Motor	56.98	56.67
Skill Practice	32.19	31.91
Scrimmage/Routine	23.04	23.04
Game	1.72	1.72
Fitness	.00	.00

Table 2 (continued)

ALT-PE Categories	High-skilled	Low-skilled
Not Engaged	53.95	59.59
Interim	.48	.83
Waiting	4.65	9.40
Off-task	.03	.22
On-task	22.37	22.66
Cognitive	26.42	26.48
Motor Engaged	46.05	40.41
Motor Appropriate	33.65	21.41
Motor Inappropriate	11.15	15.72
Supporting	1.24	3.28

occurrence of the ALT-PE categories for high- and low-skilled players are reported in Tables 3 and 4. These tables facilitated visual comparisons between high-skilled males and high-skilled females (see Table 3), and between low-skilled males and low-skilled females (see Table 4).

Visual inspection of Tables 3 and 4 revealed no significant difference in the context levels of the high- and low-skilled male and female players; however, there are marked differences in the groups at the learner involvement levels. All four groups of players spent approximately one-fourth of their time performing general activities. Most of this time was spent warming-up (approximately 14% for high- and low-skilled males and 16% for high- and low-skilled females). Slightly less than 10% of the practice time was devoted to transition activity by all four groups of players. Little time was spent performing managerial tasks, and the players received no break time during the practice sessions. The male and the female coaches spent about 16% of their time relating knowledge to the high- and low-skilled players. Both coaches spent slightly less than 10% of the time discussing strategy. All four groups of players discussed technique with their coaches for a small amount of time (about 3.5% for high- and low-skilled males and 5.5% for the high- and low-skilled females). Virtually no time was spent by the high- and low-skilled male and female athletes discussing rules, social behavior, or background with their coaches. High- and low-skilled male and female players spent nearly 60% of the time

Table 3  
 Percent Occurrence of ALT-PE Categories for  
 High-skilled Male and Female Players

ALT-PE Categories	Male	Female
General Content	25.27	26.80
Transition	9.13	7.97
Management	1.76	2.77
Break	.00	.00
Warm-up	14.38	16.06
Subject Matter Knowledge	15.68	16.22
Technique	3.49	5.51
Strategy	9.42	7.81
Rules	.78	.89
Social Behavior	.00	.38
Background	1.99	1.63
Subject Matter Motor	59.05	56.98
Skill Practice	26.48	32.19
Scrimmage/Routine	22.93	23.04
Game	9.64	1.72
Fitness	.00	.00

Table 3 (continued)

ALT-PE Categories	Male	Female
Not Engaged	48.02	53.95
Interim	.98	.48
Waiting	3.41	4.65
Off-task	.06	.03
On-task	19.43	23.37
Cognitive	24.14	26.42
Motor Engaged	51.98	46.05
Motor Appropriate	38.38	33.65
Motor Inappropriate	13.37	11.15
Supporting	.23	1.24

Table 4  
 Percent Occurrence of ALT-PE Categories for  
 Low-skilled Male and Female Players

ALT-PE Categories	Male	Female
General Content	25.27	26.83
Transition	8.96	7.97
Management	1.93	2.77
Break	.00	.00
Warm-up	14.38	16.09
Subject Matter Knowledge	15.76	16.50
Technique	3.55	5.51
Strategy	9.41	8.06
Rules	.84	.86
Social Behavior	.00	.38
Background	1.96	1.69
Subject Matter Motor	58.97	56.67
Skill Practice	26.65	31.91
Scrimmage/Routine	22.75	23.04
Game	9.58	1.72
Fitness	.00	.00

Table 4 (continued)

ALT-PE Categories	Male	Female
Not Engaged	54.29	59.59
Interim	1.53	.83
Waiting	9.27	9.40
Off-task	.20	.22
On-task	20.10	22.66
Cognitive	23.19	26.48
Motor Engaged	45.71	40.41
Motor Appropriate	24.28	21.41
Motor Inappropriate	20.45	15.72
Supporting	.98	3.28

in subject matter motor activity. High-skilled females received skill practice 32.19% of the time versus 26.48% for the high-skilled males. Low-skilled females received more skill practice time than low-skilled males (31.91% versus 26.65%). All groups of players scrimmaged for about 23% of the practice time. Both the low- and high-skilled male lacrosse players were involved in game play much more than their female counterparts (approximately 10% versus approximately 2%). Neither coach spent any time on fitness activities.

While the data in Tables 3 and 4 revealed similarities between the context levels of the high- and low-skilled male and female lacrosse players, differences were found in their learner involvement levels. Significant differences existed between the learner involvement levels of high-skilled male and female lacrosse players as shown in Table 3. High-skilled female players were not engaged more than high-skilled male players (53.95% versus 48.02%). Close to 25% of the practice time was spent in cognitive activity by both high-skilled groups. High-skilled females spent 3.94% more of their time in on-task behaviors. High-skilled females had to wait about as much as high-skilled males (4.65% versus 3.41%). Interim and off-task behaviors did not account for much time in practice. High-skilled males accrued more motor engaged time when compared to the high-skilled females (51.98% versus 46.05%). A significant difference was evident in the amount of time that high-skilled players were engaged in motor

appropriate activity (ALT-PE) (38.38% for male players versus 33.65% for high-skilled female players). High-skilled players were inappropriately engaged similar amounts of the time (13.37% for high-skilled males versus 11.15% for females). Little practice time was devoted to supporting the motor activities of others by either high-skilled group of players. These differences led to the rejection of the third major hypothesis which stated that there would be no significant difference between the ALT-PE of high-skilled male and high-skilled female collegiate lacrosse players.

Significant differences existed between the learner involvement levels of low-skilled male and female lacrosse players as shown in Table 4. Low-skilled females accrued 5.3% more nonengaged time than low-skilled males. Almost all of this difference occurred in the on-task (22.66% for females versus 20.10% for males) and the cognitive (26.48% for females versus 23.19% for males) categories. Approximately 9% of the practice time for low-skilled players was spent waiting to participate. Percentages for interim and off-task activities were minimal for both low-skilled males and females. Low-skilled males were engaged more than low-skilled females (45.71% versus 40.41%). Low-skilled males also accrued more ALT-PE (24.28% versus 21.41%) and were engaged in more motor inappropriate behavior (20.45% versus 15.72%). Hardly any time was spent by low-skilled males in supporting motor activity while low-skilled females spent only 3.28% of their time in this manner. These results led to the rejection of

the fourth major hypothesis which stated that there would be no significant difference between the ALT-PE of low-skilled male and low-skilled female collegiate lacrosse players.

#### Summary

Interobserver agreement (IOA) scores were calculated using the scored-interval method (Hawkins & Dotson, 1975). Four randomly selected videotapes, two of the male lacrosse team's practices and two of the female lacrosse team's practices, were coded simultaneously by Dr. Victor H. Mancini and the investigator. IOA scores ranged from 87.0% to 100% which were sufficient to indicate the coders were reliable.

Visual comparison of the ALT-PE data for high- and low-skilled male and female collegiate lacrosse players revealed no significant differences in the context levels (see Tables 1, 2, 3, and 4). At the learner involvement levels, however, significant differences were found between high- and low-skilled males, high- and low-skilled females, high-skilled males and females, and low-skilled males and females.

Low-skilled male lacrosse players were engaged in less motor activity of appropriate difficulty (ALT-PE) (24.28% versus 38.38%) than were their high-skilled teammates (Table 1). Much of the low-skilled players' time was spent in inappropriate motor activity and waiting to participate.

Low-skilled females were appropriately engaged (ALT-PE) much less than the high-skilled females (21.41% versus 33.65%) and had to wait more (see Table 2). They also spent more time engaged in motor inappropriate activity than their high-

skilled teammates.

Tables 3 and 4 allowed comparisons to be made between male and female players of similar abilities. The only marked difference found at the context level occurred in the amount of time spent in game playing. Both high- and low-skilled males accrued much more game playing time in practice than did their female counterparts. Significant differences were found at the learner involvement levels. High-skilled male players were motor-engaged more than high-skilled female players (51.98% versus 46.05%) and accumulated more ALT-PE (38.38% versus 33.65% for high-skilled females) (see Table 3). As shown in Table 4, low-skilled males were engaged more than low-skilled females (45.71% versus 40.41%). Also, low-skilled females accrued more ALT-PE (24.28% versus 21.41%).

Visual comparison of the results of this study indicated that significant differences existed between the ALT-PE of high- and low-skilled male and female collegiate lacrosse players. Thus, all four of the major hypotheses were rejected.

## Chapter 5

### DISCUSSION OF RESULTS

In this investigation, the Academic Learning Time-Physical Education (ALT-PE) of high- and low-skilled male and female collegiate lacrosse players were compared. This chapter will discuss the results of this investigation and compare the findings with those of other studies.

Visual inspection of Table 1 revealed no significant differences in the context levels of high- and low-skilled male lacrosse players. These results were predictable when one realizes that the male coach dealt with his team as a single unit. He did not organize his practice sessions in ways that allowed small groups within the team to perform different activities at the same time. Instead, the male team's practice time was organized such that all players of all abilities would be engaged or not engaged in the same manner. For example, when the high-skilled players were warming-up, the low-skilled players were too. When the low-skilled players discussed strategy with the coach, the high-skilled players did also. This method of coaching accounts for the lack of context level differences. The data for high- and low-skilled females showed no significant differences between context levels and indicated that the female coach also dealt with her team as a unit (Table 2).

Although few differences were evident at the context

level, significant differences occurred in the players' learner involvement levels. Table 1 revealed substantial differences between the ALT-PE of high- and low-skilled male lacrosse players. Low-skilled males were appropriately engaged less often (24.28% versus 38.38%), and they accrued more motor inappropriate behavior (20.45% versus 13.37%). In addition, low-skilled males waited nearly three times as much as the high-skilled players (9.27% versus 3.41%). For both the context and learner involvement levels, the female players' data reflected the same relationships between high- and low-skilled athletes that were evident for the male lacrosse team (Table 2). High-skilled female players were engaged in more motor appropriate behavior (33.65% versus 21.4%), while low-skilled players accrued more motor inappropriate time (15.72% versus 11.15%). Low-skilled females waited twice as much (9.40% versus 4.65%) as their high-skilled teammates. The findings indicated that the male and female coaches treated their high- and low-skilled players differently.

There are two plausible explanations for the low-skilled male and female players' accrual of less ALT-PE during practice. It is possible that the long periods of waiting may be responsible for the low-skilled players' lower levels of success (motor appropriate and motor inappropriate times). Because they waited more, low-skilled male and female players probably received less trials during skill-related activities, and, therefore, they received fewer opportunities to improve

their skills. This would account for their lower ALT-PE levels and motor-engaged times. Another possible explanation for these results is directly related to the ability levels of the high-skilled players. Since high-skilled male and female players were, by definition, more skilled, it is logical that they would be more successful than low-skilled players (as evidenced by their higher ALT-PE levels). It may be reasoned that the coaches designed their practices with their high-skilled players in mind. If the coaches geared their practice activities toward their high-skilled athletes, or "starters," the results found in Tables 1 and 2 are predictable.

When the data for males and females were compared (Tables 3 and 4), the context levels, especially the percentages for general content, subject matter knowledge, and subject matter motor, were similar. It seems remarkable that two coaches would conduct such similar practice sessions on a regular basis. Both coaches devoted about 60% of their practice time to motor activity. Both coaches spent 16% of their time in subject matter knowledge and about 26% of the time in general content activity. Both groups of players spent about 8% of their time in transition (organizing and moving from place to place). Approximately 50% of the practice time was devoted to scrimmage and skill practice for both teams. The largest differences at the context level were in accrued time during skill practice and game play. Males accrued about 8% more time in game play and approximately 5.5% less time in

skill practice activity. The male coach allowed his players to compete or scrimmage without his intervention more than the female coach. The female coach utilized more drills than the male coach.

The reasons for such similarities between coaches' practice sessions may only be speculated. Lacrosse is a unique game, if only for the reasons that it is played by relatively few people in very few parts of the country. Perhaps the similarities between the male and the female coaches arose from a common coaching philosophy which has traditionally been associated with the sport of lacrosse. Perhaps the techniques used by the coaches were developed in the same area or by the same people. It is likely that two individuals, coaching at the same institution, might employ similar methods.

Another factor, which may have resulted in the coaches' devoting similar amounts of time to subject matter knowledge, is the inclement weather with which all spring coaches in the central New York area must deal. Perhaps the male and female coaches in this study spent time relating knowledge to their players in classrooms or other indoor settings and designed their outdoor practices to take advantage of the good weather. This would account for the little time spent in the discussion of strategies, techniques, and rules.

The findings for high-skilled players (Table 3) and low-skilled players (Table 4) indicated significant differences existed at the learner involvement levels. These results

revealed that high-skilled male lacrosse players accrued more motor-engaged time than high-skilled females (51.98% versus 46.05%). Male players at the low-skilled level were also more motor-engaged than their female counterparts (45.71% versus 40.41%). A possible explanation for the males' higher levels prevailed in the male coach's practice strategy. The male coach allowed his high- and low-skilled players to compete or participate in game play on their own much more than did the female coach (approximately 10% versus approximately 2%). This could account for the higher motor-engaged levels of the male players.

At the learner involvement level, high-skilled male lacrosse players were more successful (ALT-PE) than high-skilled females (38.38% versus 33.65%). Low-skilled male players were also more successful than their female counterparts (24.28% versus 21.41%). One possible explanation for these results was the different lacrosse sticks used by male and female lacrosse players. Male players' lacrosse sticks are able to be shaped so that a "pocket" can be formed which will keep the ball stationary and provide better control. Female players' lacrosse sticks, on the other hand, are often made of materials which are less conducive to good ball control. Also, it is illegal for females' lacrosse sticks to have a "pocket" thus effective ball control is more difficult to achieve for female lacrosse players. Because of these differences in equipment female lacrosse players might drop balls more or miss more passes than male lacrosse players.

This could explain the high- and low-skilled females' lower success levels.

The original ALT-PE instrument of Siedentop, Birdwell, and Metzler (1979) has been used in nearly all of the ALT-PE studies to date. The revised ALT-PE instrument of Siedentop, Tousignant, and Parker (1982), which was utilized in this study, is similar to the original system in many ways. However, because of some changes in categories and major subdivisions direct comparisons between this study and studies using the original instrument should be made prudently. With this in mind, the remainder of this chapter will discuss this investigation's results in comparison to the findings of related studies.

Shute, Dodds, Placek, Rife, and Silverman (1982) described ALT-PE levels in one instructor's elementary physical education classes. Two of the variables examined were the sex of the children and their skill levels. Shute et al. (1982) found no significant differences in the instructor's treatment of the boys and girls based on sex or different ability levels. These results were in partial agreement with those of the present study. Although few differences existed between the ALT-PE levels of males and females, there were significant differences between the ALT-PE of players of different abilities.

Metzler (1981) examined the ALT-PE of college students in physical education settings. An average of 45% ALT-PE was accrued by the students. This indicated both high levels of

involvement and success. These results were very similar to the ALT-PE experienced by the high- and low-skilled male lacrosse players in this investigation (51.98% versus 45.71%). Also, high- and low-skilled female players accrued similar amounts of ALT-PE (46.05% versus 40.41%). The large percentages obtained for ALT-PE indicated high levels of involvement and success on the part of college-aged individuals.

Metzler (1980b) and Rate (1981) observed the ALT-PE levels associated with different sports activities. Metzler (1980b) found that volleyball and soccer activities exhibited the highest ALT-PE percentages (59.4% and 40.3%, respectively). The task demands of lacrosse are similar to those of soccer. Thus, similar levels of ALT-PE could be expected to be associated with lacrosse and soccer. The percentages for ALT-PE found in this investigation were similar to the ALT-PE percentages reported by Metzler for soccer.

Rate (1981) observed the ALT-PE of athletes while they were practicing basketball, wrestling, gymnastics, tennis, and baseball. Results indicated that approximately 90% of the practice time was spent in content-PE. The average amount of ALT-PE for all sports was 49.3%. Although the revised ALT-PE system did not have a category for content-PE, the percentages obtained for subject matter knowledge and subject matter motor in this investigation may be combined to provide an estimate of the time spent in content-PE activities. Both the male and female lacrosse teams spent approximately

75% of their time in content-PE or lacrosse-related activities. This was less than the 90% reported by Rate. However, the average ALT-PE experienced by players in this investigation was 46.03%. This compared favorably with the average ALT-PE of 49.3% reported by Rate.

Pieron (1982) and Galli (1982) employed ALT-PE to study the effects of teacher/coach expectations on learner involvement levels. Pieron (1982) found that high-achievers accrued significantly greater amounts of ALT-PE than did low-achievers when observed in gymnastics and volleyball activities. As indicated by Tables 1 and 2, both male and female high-skilled lacrosse players accrued substantially more ALT-PE than did their low-skilled teammates. The results of the present investigation were congruent with the findings of Pieron (1982).

Galli (1982) conducted the only study to date which examined the ALT-PE of high- and low-skilled athletes. His results indicated that the low-skilled player accrued less ALT-PE than the high-skilled player and spent much more time waiting to participate. These results were in agreement with those of the present investigation.

The results of this investigation can also be compared to those of Hoffman (1981) who used the Dyadic Adaptation of Cheffers' Adaptation of Flanders' Interaction Analysis System (DAC) to analyze coaches' interactions with their athletes of different abilities. Hoffman utilized the same population as the current investigator, and data for both studies were

collected under the same circumstances. Even though many likenesses exist, no direct relationships can be established between Hoffman and the present investigation because of the use of different observation instruments. Hoffman found that the male and the female coaches interacted differently with their athletes of different abilities. The male and female coaches were both supportive and informative in their interactions with their high-skilled players. The male coach tended to be more critical of, gave more directions to, and asked more questions of his low-skilled players than of his high-skilled players. The female coach tended to be less critical with her low-skilled players. The findings of the present study paralleled Hoffman's results in the fact that players labeled high-skilled by their coaches appeared to enjoy more advantageous conditions than their low-skilled teammates. Hoffman found that the high-skilled players received more support and information from their coaches. The results of the present study indicated that high-skilled players experienced more motor involvement, were more successful, and had to wait less than their low-skilled teammates. In both cases the coaches favored their high-skilled athletes, either through their interactions with them or the opportunities they provided for them during practice sessions.

Boyes (1981) used DAC to observe the interaction patterns of college football coaches with their starting and their non-starting players. Results indicated only minor differences

in coaches' behaviors toward athletes of different abilities. Since only minor differences were found, few similarities existed between Boyes (1981) and the present investigation.

#### Summary

Very few differences were found in the context levels of the high- and low-skilled male and female lacrosse players. This may be attributed to the coaching methods of the male and female coaches. Most of the significant differences between high- and low-skilled male and female collegiate lacrosse players existed at the learner involvement level. These results led to the rejection of all four major hypotheses.

A number of possible explanations for trends in the data existed. The fact that the male and female coaches conducted similar practice sessions may be explained by common coaching philosophies and the need to make full use of outdoor facilities whenever possible because of inclement weather. The high-skilled players were more involved and experienced greater success during practices. The low-skilled players' low success levels (ALT-PE) may be related to the fact that they waited more. While waiting, low-skilled male and female players received less trials and, therefore, received fewer opportunities to improve their skills. It was likely that the superior ability of the high-skilled athletes contributed to their successful skill performance.

Males of both abilities were motor-engaged more than females of similar ability levels. These results might be

explained by the male coach's use of more game play. The higher success levels (ALT-PE) of high- and low-skilled male players might be attributed to the males' use of lacrosse sticks which allowed better ball control.

The findings of this investigation were congruent with the findings of other researchers (Galli, 1982; Hoffman, 1981; Metzler, 1980b; Metzler, 1981; Pieron, 1982; Rate, 1981; Shute et al., 1982). The results of this investigation supported the contention that coaches treat individuals differently based on their skill abilities.

## Chapter 6

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS FOR FURTHER STUDY

#### Summary

The purpose of this investigation was to observe the Academic Learning Time-Physical Education (ALT-PE) of high- and low-skilled male and female collegiate varsity lacrosse players. Forty varsity lacrosse players, 20 male and 20 female, at the same central New York college, served as subjects. The players' coaches, one male and one female, gave the investigator permission to videotape their teams' practice sessions 10 times during the course of the 1981 season. Following the season, each coach ranked his/her players from high to low according to overall playing ability. The top 10 ranked players and bottom 10 ranked players were selected for participation in this study. The 20 videotapes of the practice sessions were coded using the revised Academic Learning Time-Physical Education instrument of Siedentop, Tousignant, and Parker (1982). Three target players were randomly selected during each practice session to represent each group of subjects: high-skilled males, low-skilled males, high-skilled females, and low-skilled females.

The ALT-PE data were manually scored and percentages calculated for each ALT-PE category. Descriptive statistics were used to analyze the data.

Visual inspection of data revealed few differences in

the context levels of high- and low-skilled male and female collegiate lacrosse players. However, significant differences were evident in the learner involvement levels. High-skilled male and female players were motor-engaged more, accrued more ALT-PE, spent less time inappropriately engaged, and waited much less than their low-skilled teammates (see Tables 1 and 2). High-skilled male players were on task less, motor-engaged more, and accrued more ALT-PE than the high-skilled females (see Table 3). Low-skilled male players were motor-engaged more, received less information, accrued more ALT-PE, and spent less time inappropriately engaged than the low-skilled female players (see Table 4).

The following hypotheses were rejected:

1. There would be no significant difference between the ALT-PE of high-skilled male and low-skilled male collegiate lacrosse players.
2. There would be no significant difference between the ALT-PE of high-skilled female and low-skilled female collegiate lacrosse players.
3. There would be no significant difference between the ALT-PE of high-skilled male and high-skilled female collegiate lacrosse players.
4. There would be no significant difference between the ALT-PE of low-skilled male and low-skilled female collegiate lacrosse players.

### Conclusions

The findings of this study led to the following conclusions concerning the ALT-PE accrued by high- and low-skilled male and female collegiate lacrosse players:

1. High-skilled male and female lacrosse players had more opportunity to actively perform lacrosse skills than their low-skilled teammates.
2. High-skilled male and female lacrosse players were more successful and effective (ALT-PE) in performing lacrosse skills than their low-skilled teammates.
3. High- and low-skilled males spent much more time in game play than high- and low-skilled female players.
4. Low-skilled males and females spent more time waiting for their turn to participate than their high-skilled counterparts.
5. While practicing, low-skilled male and female players were less successful in performing the lacrosse skills compared to their high-skilled teammates.
6. High- and low-skilled male lacrosse players spent more time actively participating during practices than the high- and low-skilled female players.
7. High- and low-skilled male lacrosse players were more successful and effective in performing lacrosse skills than high- and low-skilled female players.
8. Both the male and female coaches treated their high- and low-skilled players differently.

9. Overall, the male and female coaches tended to organize their practices similarly, devoting approximately the same amount of time to general activities, to relating knowledge about lacrosse, and to motor activity.

#### Recommendations for Further Study

The following recommendations are suggested for further study:

1. Follow-up studies that would examine the effects of intervention on lacrosse players' ALT-PE.
2. Follow-up studies that would examine the effects of instruction and supervision in interaction analysis on the ALT-PE of lacrosse players.
3. A study to determine if the ALT-PE of high- and low-skilled lacrosse players altered during the course of a season.
4. A study to determine if the players of successful and less successful coaches have different amounts of ALT-PE in practice.

Appendix A  
INFORMED CONSENT FORM  
COACH'S COPY

The purpose of this investigation is to observe the Academic Learning Time-Physical Education (ALT-PE) of high- and low-skilled lacrosse players. ALT-PE is that portion of practice that the lacrosse players spend in motor activity that is appropriate for their skill level.

The subjects are 40 collegiate lacrosse players, 20 male and 20 female. Subjects will be videotaped for 10 entire practice sessions during the course of the 1981 lacrosse season. The coach will be asked to wear a wireless microphone and will be filmed from an observation tower. The normal actions of the players and their coach will not be interrupted. The videotapes will be coded using the ALT-PE instrument. At the end of the season the coach will be asked to rank his/her players from high to low according to overall playing ability.

It is assured that the names in this study will be kept strictly confidential. Taping is solely for the purpose of this study and the tapes will only be available to the researcher and the coaches involved. If you do not have any questions, and you are willing to participate in this investigation, please sign your name in the space below. Thank you.

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Signature

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Date

Appendix B  
INFORMED CONSENT FORM  
ATHLETE'S COPY

The study in which you are asked to participate is observing the Academic Learning Time-Physical Education (ALT-PE) of collegiate lacrosse players. You will be videotaped 10 times during the 1981 season. The videotaping will in no way interfere with your normal actions.

It is assured that the names in this study will be kept strictly confidential. If you do not have any questions and you are willing to participate in this study, please sign your name below. Thank you.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

Appendix C  
THE ALT-PE CATEGORIES<sup>1</sup>

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Context Level

General Content Categories--refers to class time when students are not intended to be involved in physical education activities.

Transition (T). Time devoted to managerial and organizational activities related to instruction such as team selection, changing equipment, moving from one space to another, changing stations, teacher explanation of an organizational arrangement, and changing activities within a lesson.

Management (M). Time devoted to class business that is unrelated to instructional activity such as taking attendance, discussing a field trip, lecturing about appropriate behavior in the gymnasium, or collecting money for the yearbook.

Break (B). Time devoted to rest and/or discussion of nonsubject matter related issues such as getting a drink of water, talking about last night's ball game, telling jokes, celebrating the birthday of a class member, or discussing the results of a student election.

Warm Up (WU). Time devoted to routine execution of physical activities whose purpose is to prepare the individual for engaging in further activity, but not designed to alter the state of the individual on a long

## Appendix C (continued)

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General Content Categories (continued)

term basis, such as a period of light exercises to begin a class, stretching exercises prior to a lesson, or a cooling down activity to terminate a lesson.

Subject Matter Knowledge Categories--refers to class time when the primary focus is on knowledge related to physical education content.

Technique (TN). Time devoted to transmitting information concerning the physical form (topography) of a motor skill such as listening to a lecture, watching a demonstration, or watching a film.

Strategy (ST). Time devoted to transmitting information concerning plans of action for performing either individually or as a group such as explanation of a zone defense, demonstration of an individual move, or discussion of how best to move the ball down a field.

Rules (R). Time devoted to transmitting information about regulations which govern activity related to the subject matter such as explanation of the rules of a game, demonstration of a specific rule violation, or viewing a film depicting the rules of volleyball (time devoted to transmitting information about rules governing general student behavior in physical education are coded management).

## Appendix C (continued)

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Subject Matter Knowledge Categories (continued)

Social Behavior (SB). Time devoted to transmitting information about appropriate and inappropriate ways of behaving within the context of the activity such as explanation of what constitutes sportsmanship in soccer, discussion of the ethics of reporting one's own violations in a game, or explanations of proper ways to respond to officials in a game.

Background (BK). Time devoted to transmitting information about a subject matter activity such as its history, traditions, rituals, heroes, heroines, records, importance in later life, or relationship to fitness.

Subject Matter Motor Categories--refers to class time when the primary focus is on motor involvement in physical education activities.

Skill Practice (P). Time devoted to practice of skills or chains of skills outside the applied context with the primary goal of skill development, such as a circle drill in passing a volleyball, one against one practice of dribbling a basketball, exploration of movement forms, practicing the Schottische step, or practicing a particular skill on a balance beam.

## Appendix C (continued)

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Subject Matter Motor Categories (continued)

Scrimmage/routine (S). Time devoted to refinement and extension of skills in an applied setting (in a setting which is like or simulates the setting in which the skill is actually used) and during which there is frequent instruction and feedback for the participants--such as, a half court five on five basketball activity, the practice of a complete free exercise routine, six against six volleyball (all with instructions, suggestions, and feedback during the scrimmage).

Game (G). Time devoted to the application of skills in a game or competitive setting when the participants perform without intervention from the instructor/coach--such as a volleyball game, a complete balance beam routine, the performance of a folk dance, or running a half-mile race.

Fitness (F). Time devoted to activities whose major purpose is to alter the physical state of the individual in terms of strength, cardiovascular endurance, or flexibility such as aerobic dance, distance running, weight lifting, or agility training (the activities should be of sufficient intensity, frequency, and duration so as to alter the state of the individual).

## Appendix C (continued)

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Learner Involvement Level

Not Motor Engaged Categories--refers to all involvement other than motor involvement with subject matter oriented motor activities.

Interim (I). The student is engaged in a noninstructional aspect of an ongoing activity such as retrieving balls, fixing equipment, retrieving arrows, or changing sides of a court in a tennis match.

Waiting (W). Student has completed a task and is awaiting the next instructions or opportunity to respond such as waiting in line for a turn, having arrived at an assigned space waiting for the next teacher direction, standing on a sideline waiting to get in a game, or having organized into the appropriate formation waiting for an activity to begin.

Off-task (OF). The student is either not engaged in an activity he/she should be engaged in or is engaged in activity other than the one he/she should be engaged in--behavior disruptions, misbehavior, and general off-task behavior, such as talking when a teacher is explaining a skill, misusing equipment, fooling around, fighting, disrupting a drill through inappropriate behavior.

On-task (ON). The student is appropriately engaged carrying out an assigned non-subject matter task (a management task, a transition task, a warm up task) such

## Appendix C (continued)

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Not Motor Engaged Categories (continued)

as moving into squads, helping to place equipment, counting off, doing warm up exercises, or moving from the gym to a playing field.

Cognitive (C). The student is appropriately involved in a cognitive task such as listening to a teacher describe a game, listening to verbal instructions about how to organize, watching a demonstration, participating in a discussion or watching a film.

Motor Engaged Categories--refers to motor involvement with subject matter oriented motor activities.

Motor appropriate (MA). The student is engaged in a subject matter motor activity in such a way as to produce a high degree of success.

Motor inappropriate (MI). The student is engaged in a subject matter oriented motor activity but the activity-task is either too difficult for the individual's capabilities or the task is so easy that practicing it could not contribute to lesson goals.

Supporting (MS). The student is engaged in subject matter motor activity the purpose of which is to assist others learn or perform the activity such as spotting in gymnastics, feeding balls to a hitter in a tennis lesson, throwing a volleyball to a partner who is practicing set up passing, or clapping a rhythm for a group of

## Appendix C (continued)

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Motor Engaged Categories (continued)

students who are practicing a movement.

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<sup>1</sup>Cited from Siedentop, Tousignant, and Parker (1982, pp. 11-15).

Appendix D  
 INTEROBSERVER AGREEMENT PERCENTAGES FOR  
 FOUR RANDOMLY SELECTED VIDEOTAPES

	Tape 1	Tape 2	Tape 3	Tape 4
GENERAL CONTENT	94.0	90.3	87.6	93.2
Transition	93.1	89.2	90.0	92.3
Management	100.0	100.0	91.6	100.0
Break	----	----	----	----
Warm Up	94.3	89.8	89.2	92.8
SUBJECT MATTER KNOWLEDGE	92.3	91.6	88.2	93.7
Technique	88.9	88.8	88.2	93.3
Strategy	90.9	92.8	88.1	92.3
Rules	----	----	----	----
Social Behavior	----	----	----	----
Background	100.0	----	----	95.0
SUBJECT MATTER MOTOR	97.1	93.0	87.9	94.2
Skill Practice	92.4	92.5	87.7	93.5
Scrimmage/Routine	88.6	93.9	88.4	95.5
Game	93.9	----	----	----
Fitness	----	----	----	----

## Appendix D (continued)

	Tape 1	Tape 2	Tape 3	Tape 4
NOT MOTOR ENGAGED	96.2	87.5	96.7	97.2
Interim	100.0	100.0	100.0	100.0
Waiting	93.1	88.8	97.4	92.5
Off-task	100.0	100.0	100.0	----
On-task	91.7	87.0	98.1	98.3
Cognitive	96.8	87.3	95.3	98.7
MOTOR ENGAGED	95.7	91.5	90.6	93.4
Motor Appropriate	95.3	92.1	91.3	93.2
Motor Inappropriate	96.5	89.3	89.6	93.4
Supporting	----	100.0	----	----

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