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A COMPARISON OF THE ACADEMIC LEARNING TIME-PHYSICAL
EDUCATION OF HIGH-SKILLED AND LOW-SKILLED FEMALE
INTERCOLLEGIATE SOCCER PLAYERS

by

Cheri L. Goetcheus

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

May 1988

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 female intercollegiate soccer players. Twelve female soccer players at the same college in central New York served as subjects. The head coach, a female, was asked to rank her players from high to low according to overall playing ability. The top six ranked players were selected to represent the high-skilled group and the bottom six ranked players were selected to represent the low-skilled group. The coach wore a wireless microphone and was videotaped along with her team 12 times during the 1984 season. The videotape of each practice session was coded using the revised ALT-PE instrument of Siedentop, Tousignant, and Parker (1982). During the coding of each practice session, three target players were selected to represent each group. 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 the 21 ALT-PE categories. Visual analysis of the data revealed no significant differences in the context levels of high- and low-skilled players. However, significant differences were found in the learner involvement levels, particularly the motor appropriate engaged time (ALT-PE). High-skilled players were more frequently engaged in motor activity, accrued more ALT-PE, spent less time inappropriately engaged, and waited much less than their low-skilled teammates. The differences in accrued ALT-PE between high-skilled and low-skilled female soccer players led to the rejection of the null hypothesis that

stated there would be no significant differences in accrued ALT-PE between high-skilled and low-skilled female intercollegiate soccer players.

A COMPARISON OF THE ACADEMIC LEARNING TIME-PHYSICAL
EDUCATION OF HIGH-SKILLED AND LOW-SKILLED FEMALE
INTERCOLLEGIATE SOCCER PLAYERS

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

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

by
Cheri L. Goetcheus

May 1988

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

CERTIFICATE OF APPROVAL

MASTER OF SCIENCE THESIS

This is to certify that the Master of Science Thesis of
Cheri L. Goetcheus

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 has been approved.

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Education: _____

Dean of Graduate
Studies: _____

Date: _____

3/20/88

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Chapter 1

INTRODUCTION

In the past decade there has been increasing concern about teacher effectiveness (Berliner & Rosenshine, 1977; Cruickshank, 1976) and the degree to which a student is involved in learning, as measured by time (Carroll, 1963). In the classroom, as well as in the gymnasium and on the athletic fields, researchers are interested in the concept that what teachers/coaches do relates to what their students/athletes achieve (Locke, 1977). Thus physical educators and coaches must be concerned with the structuring of their environment in order to present each student or athlete the most opportune environment for achievement.

Investigators have found that within the classroom and gymnasium definite patterns of behavior, performance expectations, and systems emerge, which separate those individuals doing well from those individuals doing poorly (Rist, 1970). Rosenthal and Jacobson (1968) stated that teachers give differential treatment to students based on their expectations of these students. The teachers' expectations for student achievement function as self-fulfilling prophecies. A self-fulfilling prophecy is an expectation which initiates a series of events that causes the original expectation to come true (Martinek & Johnson, 1979). In other words, students may live up, or down, to their teachers' expectations of them (Rosenthal, 1973). Therefore, the self-fulfilling prophecy can function in a positive or negative direction.

In the past 20 years various interaction analysis (IA)

systems have been developed and utilized by physical educators to examine teacher-student and coach-athlete interactions. Cheffers (1972) developed the Cheffers' Adaptation of the Flanders' Interaction Analysis System (CAFIAS) to examine teachers' and students' behaviors and their interaction patterns. This IA system is one of the most popularly used systems in physical education. However, CAFIAS is difficult to use for those researchers striving to investigate the influence of a teacher's expectations on a specific student's achievement because it centers on the whole class, obscuring the teacher's interactions with individual students. Allard (1979) stated that many studies have analyzed data on the entire class/team rather than interactions between a teacher/coach and an individual student/athlete. IA systems that look at an entire class/team are too general to offer information about individual students/athletes in physical education and athletics (Allard, 1979). To remedy this shortcoming, Martinek and Mancini (1979) developed the Dyadic Adaptation of CAFIAS (DAC), which provides a method for coding and analyzing interactions that occur between a teacher/coach and an individual or a small group of students/athletes. A number of researchers have used DAC (Devlin, 1979; Hoffman, 1981; Martinek & Mancini, 1979; Reisenweaver, 1980; Streeter, 1980) to investigate the effects of teachers'/coaches' expectations in the physical education/athletic setting.

Academic Learning Time-Physical Education (ALT-PE) is another systematic observation instrument being used in physical education teaching and coaching situations with increasing frequency (Siedentop, Birdwell, & Metzler, 1979; Siedentop,

Tousignant, & Parker, 1982). The ALT-PE instrument has its foundation in Academic Learning Time (ALT). ALT is defined as "the amount of time a student is engaged in an appropriate task that can be performed with high success" (Siedentop et al., 1979, p. 1). Time-on-task, which has been seriously neglected in teacher effectiveness research in the past (Metzler, 1979), is a major aspect of ALT. Teachers influence student time-on-task, which may affect overall student performance (Berliner, 1976). Siedentop et al. (1979) used ALT as a basis to develop the ALT-PE observational system, which provided a measure of ALT while considering characteristics of the physical education setting. ALT-PE focuses on teacher effectiveness and the amount of time a student is engaged in activity in the gymnasium and on the athletic fields (Siedentop et al., 1979). Several researchers (Aufderheide, Knowles, & McKenzie, 1980; Metzler, 1979, 1980; Shute, Dodds, Placek, Rife, & Silverman, 1982) have used ALT-PE in a diversity of physical education settings.

Five years after its development Siedentop et al. (1982) modified the ALT-PE instrument to make it easier to use. The revised ALT-PE instrument consists of a two-level, hierarchical decision-making system. The first level requires a decision on the context of the environment. For each observation, a decision is made as to whether the class/team is engaged in general content activities or in subject-matter content activities. The context decision focuses on observations of the class/team as a whole group. The second level of decision-making involves decisions concerning the involvement of the individual learners. The learner involvement level has two

subdivisions, motor engaged and not motor engaged. At these two subdivisions, the individual student's/athlete's activities is classified into one or the other category. All learner involvement decisions are determined by observation of an individual target student/athlete. ALT-PE can be used to gather information concerning how much time an individual is involved in a task and able to perform that task effectively and successfully (Siedentop et al., 1982).

Numerous studies (Murphy, 1984; Murray, 1984; Shields, 1984; Thomas, Mancini, & Wuest, 1984; van der Mars, Mancini, Wuest, & Galli, 1984; Wuest, Mancini, Terrillion, & van der Mars, 1984) using the ALT-PE instrument have concluded that this observation system can be used to collect reliable data and give valid information about athletic achievement of different ability athletes. These researchers studied the activities of high- and low-skilled players of interscholastic basketball, intercollegiate basketball, intercollegiate soccer, intercollegiate football, intercollegiate volleyball, and intercollegiate lacrosse teams. At the context level, no differences were found between the high-skilled players and their lesser skilled teammates. However, at the learner involvement level several significant differences were identified. The high-skilled players were engaged in motor activity more often, accrued more ALT-PE, and spent less time waiting than their lesser skilled teammates.

Recently studies using the ALT-PE instrument and focusing upon the effects of coaches' expectations on their athletes of different skill levels have increased in number. However, thus far only one of the studies has worked with female collegiate

varsity soccer players. It was the purpose of the investigator to focus on employing the ALT-PE instrument to examine the actions of an intercollegiate varsity soccer coach with her athletes of differing abilities.

Scope of Problem

The purpose of this study was to compare the amount of quality soccer practice time experienced by high-skilled and low-skilled female soccer athletes. Subjects were a female varsity soccer coach and 12 female varsity soccer players from a NCAA Division III college in central New York State.

At the end of the season, the coach ranked her athletes from high-skilled to low-skilled, according to overall soccer ability. For this study, only the top six ranked and the bottom six ranked athletes were selected as target players. These athletes were observed for 12 practice sessions, and the videotapes were coded using the revised ALT-PE observational system (Siedentop et al., 1982).

Statement of Problem

The coaching activities of a female collegiate varsity soccer coach and the involvement of her athletes during practice sessions were investigated to determine if differences existed in the accrual of ALT-PE between high-skilled athletes and low-skilled athletes.

Null Hypothesis

There will be no significant differences in the ALT-PE of female varsity soccer players with high skill ability and female varsity soccer players with low skill ability.

Assumptions of Study

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

1. The coach's and athletes' behaviors were observable and measurable.
2. The coding of 12 practice sessions would be sufficient to produce valid data on the athletes' behaviors.
3. The practice sessions were representative of the total soccer season.
4. The coach's rankings of her athletes provided valid data on the relative skill abilities of her athletes.
5. The revised ALT-PE observation instrument provided a valid and accurate view of the athletes' involvement in the team setting.
6. The coach's and athletes' behaviors were not affected by the presence of a video camera at the practice sessions.

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 academic task with a high rate of success (Marliave, Fisher, & Dishaw, 1972).
2. Academic Learning Time-Physical Education (ALT-PE) is the amount of time a student/athlete spends engaged in a relevant physical education or sport-specific task with a high degree of success (Siedentop et al., 1982).
3. Academic Learning Time-Physical Education-Motor (ALT-PE(M)) is the amount of ALT-PE a student/athlete accrues

while engaged in direct motor responses only (Siedentop et al., 1979).

4. Allocated Time is the amount of time apportioned for a specific learning time (Marliave, 1977).

5. Engaged Time is the proportion of allocated time in which the students/athletes are actively involved (Marliave, 1977).

6. Coach is the individual who directed and was primarily responsible for the female athletes on the varsity soccer team at the central New York state Division III college in this study.

7. High-skilled Athlete is an athlete whose skill ability, as perceived by the coach, ranked her in the top 33% of the team.

8. Low-skilled Athlete is an athlete whose skill ability, as perceived by the coach, ranked her in the bottom 33% of the team.

Delimitations of Study

The following were the delimitations of the study:

1. Only one intercollegiate varsity soccer coach from the central New York area was used in the study.

2. Twelve intercollegiate female varsity soccer players, six high-skilled and six low-skilled, from the central New York area were the only subjects in this study.

3. ALT-PE was the only systematic observation system utilized in this study.

4. The coach's ranking of skill ability was the only procedure used in this investigation to rank players into high-skill or low-skill classification.

Limitations of Study

The following were the limitations of the study:

1. The findings may only be valid when the ALT-PE instrument is used.
2. Only three subjects from each skill level were observed in each practice session.
3. The findings may only be valid for the female soccer players and coaches similar to those in this study.

Chapter 2

REVIEW OF RELATED LITERATURE

The review of literature relevant to this study focuses on the following areas: (a) systematic observation in coaching, (b) the development of Academic Learning Time-Physical Education (ALT-PE), (c) studies involving ALT-PE, and (d) summary.

Systematic Observation in Coaching

Prior to 1970, few studies had been directed toward the area of systematic observation in coaching; however, within the past 10 years, there has been an increase in this area of research. Traditionally, coaching and coaching behavior studies have been conducted from assumptions, traditions, and opinions (Cratty, 1973). Instruments used in these studies consisted of questionnaires, surveys, and personality trait inventories. Accordingly, methods of coaching have basically been evaluated on opinions of influential, successful, or established coaches rather than by systematic observations (Percival, 1974). A number of studies have utilized systematic observation to describe or to measure changes in coaching behavior.

LaGrand (1970) evaluated coaches' behavioral characteristics as perceived by their athletes. A semantic differential scale, measuring coaches' behavioral characteristics, was administered to 304 male collegiate athletes. LaGrand discovered significant differences in the behavioral characteristics of coaches of different sports.

Penman, Hastad, and Cords (1974) utilized a questionnaire to study the success of 30 male high school basketball and football coaches. Researchers concluded that coaches who

displayed more authoritarian characteristics had greater coaching success.

Hendry (1973) compared the behaviors of teachers and coaches along a personality and social orientation framework. Forty-eight male and female physical education teachers and 63 male and female collegiate coaches were given a personality inventory. Results indicated that teachers possessed qualities of overt sociability, high aspirations, and desire; whereas, coaches were more organized and controlled but with more restrictive ideas. Hendry also described six female coaches in this investigation as self-contained, traditional, and controlled.

Kasson (1975) investigated teacher/coach behaviors in university physical education classes and athletic practice sessions. Coaching subject matter included baseball, wrestling, and gymnastics. The Mancuso Adaptation for Verbal and Nonverbal Behaviors (Mancuso, 1972) was the instrument used to record all behaviors. Kasson discovered that athletic coaches were not any more direct in the coaching of athletics than in the teaching of similar physical education classes.

Danielson, Zelhart, and Drake (1975) administered the Coach Behavior Description Questionnaire to investigate the behaviors of ice hockey coaches as perceived by youth ice hockey players. Investigators concluded that the most commonly perceived coaching behaviors were communicative rather than dominating in nature.

Several researchers have communicated a need for a more systematic approach to analyzing the coaching environment. Tharp and Gallimore (1976) believed that the most effective and efficient means of observation and analysis in the coaching

environment was through direct observation. Tharp and Gallimore analyzed the coaching behavior of UCLA's John Wooden during practice sessions. Results from this study indicated that over 75% of Coach Wooden's teaching acts were information-oriented and over 50% were instructionally-oriented.

A study conducted by Bain (1978) investigated differences between male and female physical education teachers and between male and female teachers and coaches. Subjects were 10 male and female physical educators and 10 male and female coaches from the Houston metropolitan area public schools. The systematic observation instrument used to collect data was the 1976 revised Implicit Values Instrument for Physical Education. Results indicated female subjects scored higher than male subjects on privacy and instructional achievement. Coaches also scored higher on privacy, instructional achievement, and specificity than teachers; however, teachers scored higher than coaches on the universalism dimension--the obligation to treat all students/athletes similarly.

Smith, Smoll, and Hunt (1977) developed the Coaching Behavior Assessment System (CBAS), which has been used to examine behaviors in athletics in a naturalistic setting. The CBAS instrument was comprised of 12 behavioral categories derived from content analysis of coaching behaviors during practice sessions and games. Reactive behaviors (responses to an immediate preceding event) and spontaneous behaviors (initiated by the coach/instructor in the absence of a precedent) were the two major behavior classes studied with this system. Conclusions of this study indicated that CBAS had its greatest use in team

sports of baseball and volleyball in which development of game play is quite predictable and the source of interaction can be readily identified. The team activities of hockey, basketball, and other similar sports were difficult to code because the observer had difficulty identifying events to which the coach was responding.

Finally, Langsdorf (1980) developed an event-recording instrument to observe the coaching behavior and coaching environment of a successful university football coach. Four nonverbal and 10 verbal coaching behaviors were observed and recorded during 18 practices. Data were compared to Tharp and Gallimore's (1976) study. The researchers concluded that there were important similarities in both coaches' behaviors. Most frequently occurring behavior categories were instruction, hustle, and scold/reinstruction for the investigated football coach.

Recently several coaching studies have used Cheffers' Adaptation of Flanders' Interaction Analysis System (CAFIAS) and the Dyadic Adaptation of CAFIAS (DAC) as observation instruments. In a study similar to Kasson (1975), Agnew (1977) investigated the behavior patterns of female secondary school physical education teachers/coaches, comparing their teaching and coaching patterns. Twenty subjects were observed and coded using CAFIAS within their teaching and coaching environments. Results showed that interactions between athletes and coaches were more evident than pupil-teacher interaction. Pupil-initiated behavior, praise, and acceptance were greater in the coaching environment than within the classroom environment.

Barr (1978) investigated the effect of instruction in interaction analysis (IA), specifically CAFIAS, on the coaching behavior of secondary school team coaches. Findings indicated significant differences between the group trained in IA and the control group which received no IA training. Coaches instructed in CAFIAS showed an increase in praise, questioning, acceptance, and allowed more athlete-initiated behavior.

Avery (1978) used the Coaches' Performance Criteria Questionnaire (CPCQ) in conjunction with CAFIAS to investigate the interaction patterns of effective and less effective secondary school coaches during practice sessions. Thirty coaches were videotaped and coded using CAFIAS to determine differences of interaction patterns between the two groups. Results indicated more indirect behaviors were exhibited by effective coaches than by less effective coaches. Similar studies were done by Rotsko (1979) and Kenyon (1981). Rotsko (1979) also used the CPCQ but restricted his study to 10 male high school varsity basketball coaches. Each coach was videotaped during four practice sessions, and tapes were coded using CAFIAS. Conclusions obtained by Rotsko concurred with results found by Avery (1978). Successful coaches used more verbal and nonverbal praise and acceptance; whereas, more verbal criticism was used by less successful coaches. Kenyon (1981) studied 30 secondary school coaches, separating them into two groups: coaches trained to teach physical education and coaches trained to teach other academic disciplines. Results concluded that there were significant differences between the two groups of coaches. Coaches trained to teach physical education showed

more indirect behaviors, especially coach-suggested verbal and nonverbal athlete-initiated behaviors. Coaches trained to teach other academic subject areas showed more direct coaching behaviors and did not allow much athlete freedom in relation to interpretive responses. Hirsch (1978), Proulx (1979), and Staurowsky (1979) used the Group Environment Scale (GES) (Moos, Insel, & Humphrey, 1974) to categorize teams as satisfied or less satisfied with their environment. Significant differences in CAFIAS variables were found between the coaches of teams in the two groups studied. Researchers concluded that coaches generally perceived their environment as being closer to ideal than did their athletes in the same environment. Coaches in more satisfactory environments had more control, provided more organization, tended to be more supportive, and used more verbal and nonverbal praise. Coaches in less satisfactory environments exhibited more verbal criticism.

Boyes (1981) and Hoffman (1981) used the Dyadic Adaptation of CAFIAS (DAC) (Martinek & Mancini, 1979) to investigate interaction patterns between football and lacrosse coaches and their athletes, respectively. Boyes (1981) studied the interaction patterns of a head football coach and his assistants with their starting and nonstarting players. Results indicated minor differences in coaches' behaviors and interaction with starting and nonstarting players. Starters received more acceptance and praise while nonstarters received more directions from their coaches. Hoffman (1981) studied a male and a female lacrosse coach trying to describe the coaching behaviors of those coaches toward their high-skilled and low-skilled athletes.

Hoffman concluded that both coaches interacted with these skill groups differently. The male coach was direct, gave more criticism, and asked more questions of the low-skilled athletes; whereas, he was more informative and supportive in his interactions with high-skilled athletes. The female coach displayed similar behaviors as the male coach in interacting with high-skilled athletes. The female coach gave more information and directions to the low-skilled athletes than the high-skilled athletes. High-skilled athletes exhibited more interpretive and self-initiated behaviors than low-skilled athletes. The low-skilled athletes exhibited more predictable behaviors than the high-skilled athletes.

Development of Academic Learning Time-Physical Education

The California Commission for Teacher Licensing and Preparation began a multi-year investigation in 1972 to study the instruction of mathematics and reading in the classroom. This research project was titled the Beginning Teacher Evaluation Study (BTES). The commission attempted to identify which teacher classroom behaviors were related to student academic learning (Fisher et al., 1972) and teacher effectiveness (Marliave, 1977). Process-product research paradigms became popular and were prominent at this time; however, researchers believed it was unrealistic to expect teacher processes at the time of instruction to influence student achievement directly on test items given many months later.

Berliner (1976) recommended substitution of the correlation approach in process-product studies. Fisher (1978) acknowledged student achievement as a variable of student learning and teacher

effectiveness but suggested there were more on-going measures of learning which were more direct and immediate. After much debate and research, the amount of time students spent successfully engaged in relevant academic learning material was selected as the observable measure; this was termed academic learning time (ALT). The researcher concluded that the proportion of time students are engaged at a high success rate is positively associated with student learning (Fisher, 1978).

The Far West Laboratory conducted BTES research in three phases. Phase I, the planning phase, was conducted in 1972-73. Phase II, a field study in 1973-74, saw the development of an observation instrument which generated hypothesis for further study. Phase III, from 1974 to 1978, was conducted using a variety of instruments developed in the earlier phase. During this phase, researchers observed 25 second grade and 21 fifth grade elementary classes. All 139 second grade and 122 fifth grade students were observed for an entire day, once a week throughout that period.

Data concerning teaching behaviors, classroom environment, student ALT, and student achievement were collected (Fisher et al., 1978). Findings for the three phases disclosed time variables to be the common denominator for analyzing and measuring classroom interaction (Marliave, Fisher, & Dishaw, 1978). In addition, Berliner (1976) reported that time-on-task can provide an actual measure of student achievement. This time-on-task concept evolved and has become known as the ALT model.

BTES researchers determined four variables comprised the

ALT model: allocated time, engaged time, student success rate, and task relevancy. The student's comprehension of class tasks was described in terms of low, medium, and high success rates. Task relevancy was another important factor in the ALT model. A task that is too easy or too difficult for a student hinders the learning process. However, Fisher et al. (1972) stated that tasks that challenge the student's ability greatly enhance the learning process.

Marliave (1978) described the major strength of ALT as its focus on individual students and their continual behaviors. The researcher concluded that the absence of ALT restricted learning, with engagement rate and error rate as possible contributory causes.

At the annual meeting of the American Educational Research Association in Toronto in 1978, the idea of ALT-PE was born. BTES research results and the logic of the ALT model were impressive to the physical education researcher searching for a standard variable by which effective teaching in physical education might possibly be studied (Siedentop, et al., 1979). Subsequently, the concept of ALT was modified by Siedentop et al. (1979) to allow for coding of physical activity. At the annual meeting of the American Alliance for Health, Physical Education, and Recreation (AAHPER), Siedentop et al. (1979) presented a series of papers in attempts to explain the ALT-PE model, the coding format, and coding conventions. This modification, ALT-PE, was defined as the amount of ALT accrued by a student while in a physical education setting (Metzler, 1980).

ALT-PE was an attempt to estimate teacher effectiveness in a physical education setting in the absence of valid and reliable student performance data. ALT-PE was also assumed to be consistently and strongly related to student achievement in physical education. The determinant variables of ALT-PE provided a sound theoretical perspective from which to analyze the students' opportunities to acquire the skills and knowledge of motor play activities (Metzler, 1982).

The original ALT-PE model was an achievement-centered model, designed to help teachers prepare instruction in order to give students greater opportunity to learn motor skills. Metzler (1982) stated that ALT-PE's greatest strength was its ability to provide a logical blueprint for planning instructional behaviors and decisions in the physical education setting, thus making it a reliable indicator of teaching effectiveness.

A number of studies were completed utilizing the early ALT-PE model. Because the idea of ALT-PE spread rapidly and widely among researchers in physical education, ALT-PE symposia were held at the 1980 and 1981 American Alliance for Health, Physical Education, Recreation, and Dance (AAHPERD) conventions. During the initial ALT-PE effort, questions rose as to the manner in which this observational system was conceptualized and operationalized. With further research in education and physical education, the awareness of ALT and its relationship to achievement increased. By the spring of 1981, it became apparent that a revision in the ALT system was timely and necessary (Siedentop et al., 1982).

The original ALT-PE (Siedentop et al., 1979) instrument

consisted of four major decision levels: (a) setting, with 6 subcategories; (b) content (general physical education) with 13 subcategories; (c) learner moves, with 6 subcategories; and (d) task difficulty, with 3 subcategories. A total of 28 subcategories were used to explain the major categories. Finally, a subvariable of general ALT-PE, labeled ALT-PE(M), was included to identify when the target student was engaged in a relevant motor task with an easy level of difficulty (Metzler, 1980).

Siedentop et al. in 1982 developed a revision to the ALT-PE system. The revised ALT-PE instrument is a two-level, hierarchical system. The first level of the system required a decision on the content of the setting under observation and provided information concerning the context within which specific individual student behavior was occurring (Siedentop et al., 1982). Three major subdivisions at the context level--general content, subject matter knowledge, and subject matter motor--and 13 subcategories describe the activities which occurred during class or practice. The second level of decision-making involved observations of individual learner involvement and described the nature of learner activities within the context of a class or practice. Two major subdivisions at the learner involvement--not motor engaged and motor engaged--and eight subcategories describe individual student behavior (Siedentop et al., 1982). With the simplification in coding procedures, the revised ALT-PE model provided another way to measure ALT.

Studies Involving ALT-PE

To apply the BTES research findings and to utilize ALT in the physical education and coaching realm, Siedentop et al. (1979) developed an instrument to measure ALT in physical education and athletic settings. The ALT-PE instrument has been used by many researchers in both descriptive-analytic and experimental studies to describe elementary and secondary classes and the involvement and ALT-PE of different subgroups. These subgroups include males and females, mainstreamed and nonmainstreamed students, and students/athletes of different skill abilities.

Metzler (1979) used the ALT-PE instrument to measure the amount of ALT-PE accrued by students in a variety of physical education settings. A total of 33 elementary, junior high, and high school classes were observed from three to seven times each. Observations included a variety of different physical education activities. Prior to data collection, coder interobserver reliability was insured through a rigorous training program. Descriptive statistics were used to analyze each level of the instrument, allocated time, ALT-PE, and ALT-PE(M). 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. Metzler concluded that direct and task categories accounted for 99% of the time in setting. He also found that elementary students were engaged 11.8% more than secondary students.

Analyzing the same data, Metzler (1980) determined ALT-PE and ALT-PE(M) according to physical education focus.

Thirteen different activities were observed, but only five activities were observed in more than one educational level, which made comparisons difficult. ALT-PE ranged from 59% in elementary volleyball classes to only 12.3% in high school gymnastics classes. However, the amount of ALT-PE observed and recorded as ALT-PE(M) averaged 7.5%. The range was 24% for games at the elementary level to 3% for junior and senior high tennis classes.

Aufderheide et al. (1980) compared the ALT-PE of mainstreamed handicapped and regular students in physical education activities in Texas elementary schools. Subjects included 60 regular and 60 mainstreamed handicapped students. After teachers were classified as users or nonusers of individualized instruction in mainstreamed classes, one handicapped and one regular student in each class were observed using the ALT-PE instrument. Analysis of variance was used in data analysis. Findings revealed that students within classes of users of individualized instruction were engaged in a significantly greater amount of ALT-PE than were the students of nonusers. There were no significant differences in the amount of ALT-PE engaged in by mainstreamed handicapped and regular students.

McKenzie (1980) conducted a second study to investigate the variability in ALT-PE within and between beginning 5-7 year-old swimmers, the effect of posting skill achievement on the ALT-PE of the swimmers, and the effect of 1-min time-out contingencies on disruptive behavior. Data were collected over 26 days of summer vacation from three swim classes. Subjects were subdivided into high, medium, and low skill levels on the

basis of a pretest. In each of two classes, one child from each subgroup was selected for observation. Two subjects who exhibited high levels of disruptive behavior were selected from the third class. Extreme ALT-PE variability from 3% to 42%, with a mean of 16.9%, was exhibited. McKenzie also found that the ALT-PE increased for half of the subjects as a result of the skill achievement postings and that disruptive behavior could be reduced by the contingency program.

At the Ohio State University, Whaley (1980) conducted the first intervention study that evaluated the effects of daily monitoring and feedback on ALT-PE. Subjects were students from three high school and one middle school physical education classes in the Columbus, Ohio school system. A multiple-baseline design across settings was instituted with ALT-PE recorded each day for 6 weeks. The intervention consisted of daily feedback to the teacher about the content-PE, engaged time, motor response time, ALT-PE and ALT-PE(M). A second intervention was directed at students who were presented with daily postings of the percentage of intervals of motor response for the class. The major conclusion was that the daily monitoring and feedback had no effect on any of the dependent variables measured.

Paese (1982) used the ALT-PE instrument to assess the effect of feedback on ALT-PE and ALT-PE(M) of two student teachers at the secondary level. Subjects were observed 13 times, with each observation lasting 40 min. Teachers received both verbal and written feedback after each observation period. Teachers were also told they could decrease management time and increase students' motor responses. A multiple-

baseline across two subjects was used as the experimental design for the study. During feedback intervention, there was an increase in motor engagement from an average of 18.5% during baseline to 43% after intervention and in ALT-PE(M) from 7.5% to 19%. The researcher concluded that the increase of ALT-PE(M) had a direct effect on decreasing inappropriate behavior during class and that student teachers when provided with supervisory feedback can improve the amount of ALT-PE(M) in their class.

Attempts to increase ALT-PE in a school physical education setting have been made by use of an inservice education effort with teachers. Beamer (1983) observed two physical educators and nine physical education students in two middle schools. In cooperation with the teacher, an intervention program intended to give more feedback to low-skilled students, to get classes into activity more quickly, and to increase large group monitoring was agreed upon. Results indicated that content-PE activities averaged 60%, and ALT-PE averaged 15%. Interventions were successful in one school but not in the other. ALT-PE was found to be affected by the nature of the activity, the amount of activity time available, and the efficient use of activity time.

Studies have attempted to examine the effects of employing different instructional strategies on teachers' and students' behaviors. An instructional strategy traditionally has been defined as the vehicle or delivery system by which sequenced information is imparted to the learner by the instructor or some other informational providing source (Paese, 1982).

McKenzie, Clark, and McKenzie (1982) measured the effect of six instructional strategies: teacher-paced drilling, machine-paced drilling, student-paced drilling, task cards, sparring, and bouting during university fencing classes. Utilizing ALT-PE and the Teacher Behavior Observational System, 56 classes taught by the same instructor were observed. ALT-PE(M) rates during active learning periods ranged from 26.9% for bouting to 97.9% for machine-paced drilling. Similar differences were also evident relative to teacher feedback. Feedback ranged from 18.7% for teacher-paced drilling compared to 54.8% for student-paced drilling. McKenzie et al. (1982) proposed that these findings reflect the importance of examining various instructional strategies available.

Researchers have also used the ALT-PE instrument to compare the ALT-PE accrued by low- and high-skilled students. Pieron (1982) compared the ALT-PE of high- and low-achievers in volleyball and gymnastics activities. He discovered that high-achievers experienced significantly higher amounts of the time-on-task and success rate variables than low-achievers did in both activities. The data also suggested that instructors tended to provide feedback to low-achievers more frequently than they did to high-achievers. In spite of this extra feedback, the performance gap between the two ability groups was expected to widen because of greater time-on-task and higher success rates by the high-achievers.

Shute et al. (1982) conducted a descriptive study to examine the accrued ALT-PE of low-, medium-, and high-skilled students in elementary movement education classes taught by a

single physical education teacher. Students rated by their teacher as low-, medium-, and high-skilled were engaged in content-PE activities similar percentages of time, 80%, 78%, and 78%, respectively. Low-skilled students were engaged in a motor response at an easy difficulty level 13% of class time, and high-skilled students were engaged 16% of the time. No significant differences were discovered among the skill groups in other ALT-PE categories. This particular physical educator created a learning environment in which all students found similar amounts of success even though skill levels varied.

Smith (1983) examined the ALT-PE accrual of high- and low-skilled secondary students in a male and female physical educators' classes. The researcher found that both male and female high-skilled students spent more time engaged in motor activities and accrued more ALT-PE than their low-skilled classmates. Ryan (1983) used the ALT-PE and DAC observation instruments concurrently to describe a male elementary physical educator's interactions with his high-, average-, and low-skilled students. Ryan found that the teacher gave his high-skilled students more praise, acceptance, and information. The average- and low-skilled students received more directions and criticism than the high-skilled students. High-skilled students spent more time motor engaged and accrued more ALT-PE than their average- and low-skilled peers.

Recently, studies have used the ALT-PE instrument to observe coaches and their athletes. Rate's (1981) descriptive-analytic study was the first to use ALT-PE in an interscholastic

athletic environment. The ALT-PE of physical education students in the same central Ohio area was also compared. Rate compared the ALT-PE of 46 secondary interscholastic teams. Representation was from five different sports: baseball, basketball, gymnastics, tennis, and wrestling. Rate slightly modified the ALT-PE instrument by adding a fifth level to identify coaches' behaviors. Findings indicated that instruction was conducted in two styles only--direct and task, with 75% of instruction being direct. Basketball (86% of practice time) and wrestling (87.1%) practices were conducted in a direct manner, while gymnastics (19%) and tennis (11.1%) were more task-oriented. Over 90% of practice time was spent in content-PE time. Skill practice and scrimmage time accounted for 85% of the content-PE with other significant contributions to this level being game play (1.9%), fitness activities (3.8%), and theoretical discussion/knowledge (7.1%). ALT-PE averaged 51.4% and ranged from 27.2% for a girl's junior varsity basketball team to 68.9% for a boy's varsity basketball practice. ALT-PE(M) percentages showed that basketball players were involved in sport-specific activities of an easy difficulty level for 34.3% of the intervals coded. Coaches spent equal amounts of time in silent monitoring, management, and instruction. Considerable differences were discovered between the physical education classes and athletic settings in the same sport. Rate credited this higher level of ALT-PE in the athletic setting to different group sizes, greater level of motivation, greater availability of equipment, and the use of scrimmage techniques.

Van der Mars et al. (1984), following one of Rate's (1981) recommendations, compared the ALT-PE of high-skilled and low-

skilled male high school basketball players. An $N = 1$ design was used in which one subject from each ability group was observed for an entire practice session. A total of 20 practice sessions were videotaped, five prior to the first game, five after wins, five after losses, and five while the team was preparing for postseason competition. Van der Mars et al. (1984) found several differences between the ALT-PE of high- and low-skilled players. The high-skilled player accrued a greater amount of ALT-PE (34.3%) than the low-skilled player (30.8%) during the same practice session. Results indicated that the high-skilled player spent less time waiting and was more actively involved in motor and cognitive situations; however, no difference was found between players in the percentage of intervals coded as successful motor engagement, ALT-PE(M).

A study comparing the ALT-PE of high-skilled and low-skilled male and female collegiate lacrosse players was conducted by Thomas et al. (1984). Forty varsity lacrosse players, 20 males and 20 females, at a central New York area college served as subjects. Each coach was videotaped 10 times during the season with his/her respective teams. Three target players were selected to represent each group of subjects: high-skilled females, low-skilled females, high-skilled males, and low-skilled male lacrosse players. These target players were observed and coded for an entire practice session on an alternating interval basis. Results indicated that while there was little difference observed at the context level between the teams and between players of different ability levels, significant differences were discovered at the learner involvement level. High-skilled

male and female lacrosse athletes were motor engaged more often, accrued more ALT-PE, and spent less time waiting than their low-skilled teammates. High- and low-skilled male lacrosse athletes spent more time in game play, were motor engaged more, and experienced more ALT-PE than their high- and low-skilled female counterparts.

More recent studies at Ithaca College have also looked at the ALT-PE of different skilled athletes. Wuest et al. (1984) performed a study to compare the ALT-PE of high-, average-, and low-skilled female intercollegiate volleyball players during a season. Subjects were a female intercollegiate volleyball coach and her 12-player volleyball team. Eighteen practice sessions were videotaped and coded using the revised ALT-PE instrument (Siedentop et al., 1982). Wuest et al. (1984) discovered that low-skilled and average-skilled athletes were provided with fewer opportunities to actively participate during practices, spent greater amounts of time waiting, experienced less success, and experienced less ALT-PE than high-skilled athletes.

Murphy (1984) compared the ALT-PE of high-, average-, and low-skilled basketball players throughout various phases of a basketball season. Subjects were one male collegiate varsity basketball coach from a small college in central New York and his basketball team. Visual analysis of data revealed no significant differences in the context levels of high-, average-, and low-skilled basketball players; however, major differences were obvious in the learner involvement levels. High-skilled basketball players accrued more ALT-PE, were motor engaged more,

spent less time inappropriately motor engaged, and waited less than their average-, and low-skilled teammates. In total, high-, average-, and low-skilled players spent 81% of all practice time in basketball-related activities.

A study comparing the ALT-PE of high-skilled and low-skilled collegiate junior varsity football players was conducted by Murray (1984). Twelve junior varsity football players and their positional coach from a Division III college in central New York served as subjects. The revised ALT-PE instrument was utilized. Results revealed that there were no differences in the context levels for low- and high-skilled players. High-skilled players had greater opportunities to actively perform football skills, were more successful and effective (ALT-PE) in performing these football skills, and spent less time waiting than their low-skilled teammates.

Finally, Shields (1984) looked at the ALT-PE of high-skilled and low-skilled female collegiate soccer players. Subjects were 24 female varsity soccer players from a southeastern Connecticut college. Shields's findings were congruent to those found in similar studies. Overall, the coach devoted the same amount of time to general noninstructional activities, and both high- and low-skilled players received the same amount of soccer-related information and motor activity. However, significant differences were found in the involvement of the high- and low-skilled players during these activities. High-skilled soccer players had more opportunity to actively perform soccer skills and were more successful and effective (ALT-PE) in performing those skills than their low-skilled counterparts. Low-skilled players spent

more time waiting than their high-skilled teammates.

Summary

This chapter examined the literature relevant to the systematic observation of the behaviors of the coach and athlete, the development of the ALT-PE instrument, and studies using the ALT-PE instrument. A number of instruments were identified, and some of the research conducted using these instruments was discussed.

Within the last 15 years, the systematic observation of coaching began to increase substantially, and a few investigators began to use these techniques to observe coaches and their athletes. In some instances, researchers developed their own instruments if an existing one was not available for their study. Kasson (1975) examined the behaviors of teachers/coaches with the Mancuso Adaptation for Verbal and Nonverbal Behavior (Mancuso, 1972). Tharp and Gallimore (1976), Smith et al. (1977), Langsdorf (1980), and Rate (1981) also used systematic observation methods to assess the behaviors of coaches and their athletes.

Several researchers utilized CAFIAS to observe coaching behaviors. Agnew (1977), Avery (1978), Barr (1978), Boyes (1981), Hirsch (1978), Hoffman (1981), Proulx (1979), and Rotsko (1979) used CAFIAS or its modification, DAC, in various contexts which made significant contributions to coaching literature.

ALT, a new observation system, was conceptualized by researchers at the Far West Laboratory for Research and Development. After limited use in the classroom environment

(Fisher et al., 1972; Marliave et al., 1972) Siedentop et al. (1979) modified the ALT observation instrument for use in the physical education environment. This modification, ALT-PE, is an orderly procedure for recording student/athlete participation in the physical education environment and describing teacher/coach effectiveness (Siedentop et al., 1979).

Aufderheide et al. (1980) and Metzler (1980) used ALT-PE to compare several levels of ALT-PE in elementary and secondary physical education classes. Metzler (1980) also examined students' ALT-PE in different sport activities.

Beamer (1983), Paese (1982), and Whaley (1980) tried to alter teaching behaviors through the use of different intervention strategies. Metzler (1980) and McKenzie et al. (1982) observed the ALT-PE accumulated by students when their instructors utilized various instructional strategies.

Pieron (1982), Ryan (1983), Shute et al. (1982), and Smith (1983) utilized the ALT-PE instrument to investigate the ALT-PE accrued by low-skilled and high-skilled students. Pieron (1982), Ryan (1983), and Smith (1983) established that high-achievers accrued significantly higher amounts of ALT-PE than did low-achievers. In contrast, Shute et al. (1982) found that the observed teacher created a learning environment where all students found similar amounts of success even when skill levels varied.

Another group of investigators (Murphy, 1984; Murray, 1984; Rate, 1981; Shields, 1984; Thomas et al., 1984; van der Mars et al., 1984; Wuest et al., 1984) used the ALT-PE system to investigate athletes' opportunities and success in the

athletic environment. Studies comparing the ALT-PE of athletes with different skill levels were conducted by Murphy (1984), Murray (1984), Shields (1984), Thomas et al. (1984), and Wuest et al. (1984). Results from these studies indicated that high-skilled athletes accumulated more ALT-PE than low-skilled athletes.

The ALT-PE observation instrument has been utilized to answer a diversity of questions during the past 8 years since its development in 1979. Recent research using ALT-PE indicates it is an effective, reliable, and valid tool for observation of teachers and coaches. Amounts of accrued ALT-PE are 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 of establishment of intraobserver agreement, the procedures, the method of data collection, the scoring of data, and the treatment of data. A summary of the methods and procedures utilized is also included.

Selection of Subjects

The subjects in this investigation consisted of 12 varsity female soccer players and their coach from a NCAA Division III college in central New York. The players' assistant coach, who was also the investigator, had practice sessions videotaped by a student manager involved with the soccer team. An informed consent form (Appendix A) was used in this investigation to obtain each athlete's permission to participate. The coach ranked her players from high to low according to overall playing ability at the end of the season. The top six players were classified as high-skilled, and the bottom six ranked players were classified as low-skilled players for this investigation.

Testing Instrument

The revised ALT-PE systematic observation system (Siedentop et al., 1982) was used to code the practice videotapes. 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, and subject matter motor) and two major subdivisions at the learner involvement

level (not motor engaged and motor engaged). There are 13 categories within the subdivisions of the context level that describe the nature of the class/practice environment and eight categories within the learner involvement level that describe the individual student/athlete behavior. The interval recording technique used in this investigation was a 6-s observe, 6-s record format.

Intraobserver Agreement

The scored-interval agreement method (Hawkins & Dotson, 1975) was used to assess intraobserver agreement (IOA). Four videotapes were randomly selected and coded by Dr. Victor H. Mancini, an expert in descriptive-analytic techniques. 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 intervals on which there was agreement and disagreement and multiplying the result by 100 (Herson & Barlow, 1976). The formula is given below:

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

When the target behavior was recorded as occurring during the same interval of both coding sessions, it was determined to be in agreement. Disagreement was recorded when the behavior recorded during the same interval did not occur for both coding sessions.

Procedures

Each player in this study was videotaped with her knowledge and consent during the 12 practice sessions. Videotapes began after warm-up activities had finished. The coach wore a wireless

microphone which did not interfere with her coaching actions.

At the end of the season, the coach was asked to rank her players from high to low according to overall playing ability. For this study the top six ranked players were selected to represent the high-skilled group, and the bottom six ranked players were selected to represent the low-skilled group.

The videotapes were coded using the revised ALT-PE instrument by an expert coder, Dr. Victor H. Mancini. During the coding of each practice session, three target players were selected to represent each group: high-skilled and low-skilled. The target players representing each group were observed for an entire practice session on an alternating interval basis, using a 6-s observe, 6-s record coding format. In each interval, both a high-skilled and a low-skilled player were coded. 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 12 videotapes of the team's practice sessions. The videotapes were coded by an expert coder, Dr. Victor H. Mancini, using the revised ALT-PE system.

Scoring of Data

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

Treatment of Data

Descriptive statistics were calculated for each ALT-PE variable. The percentages and ratios of the ALT-PE variables were visually compared to determine differences in involvement

and the ALT-PE between high-skilled and low-skilled female varsity soccer players during their practice sessions.

Summary

The subjects in this study were 12 female intercollegiate varsity soccer players from a central New York college. At the end of the season the coach ranked her players from high to low according to overall playing ability. The top six ranked players were considered high-skilled, and the bottom six ranked players were considered low-skilled for this investigation. Twelve practice sessions were videotaped during the same season.

The videotapes were coded using the revised ALT-PE system by Dr. Victor H. Mancini, an expert in descriptive-analytic techniques. During the coding of practices, three players were randomly selected to represent each group of athletes. IOA was calculated on a scored-interval basis using the formula prescribed by Herson and Barlow (1976). The data were scored manually, and percentages and ratios for the 21 ALT-PE variables were calculated. Visual comparisons were used to determine differences between high-skilled and low-skilled players.

Chapter 4

ANALYSIS OF DATA

The results obtained when comparing the Academic Learning Time-Physical Education (ALT-PE) of high- and low-skilled female intercollegiate soccer 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) intraobserver agreement, (b) ALT-PE results, (c) ALT-PE variables day-to-day, and (d) summary.

Intraobserver Agreement

Intraobserver agreement (IOA) scores were computed using the scored-interval method (Hawkins & Dotson, 1975). Four randomly selected videotapes were coded during two independent coding sessions by Dr. Victor H. Mancini, an expert in descriptive-analytic studies. IOA scores ranged from 93.7% to 100% which were sufficient to indicate the coder was reliable.

ALT-PE Results

The percentages for the ALT-PE categories of high-skilled and low-skilled female intercollegiate soccer players are summarized in Table 1. These calculations were obtained from 4072 observation intervals of the high- and low-skilled soccer players in practice sessions.

Visual comparisons of the data in Table 1 revealed no significant differences in the context levels of high- and low-skilled soccer players, but marked differences were found in the learner involvement levels of these two groups. The amount

Table 1

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

| ALT-PE Categories | High-skilled | Low-skilled |
|--------------------------|-------------------|-------------|
| General Content | 9.5 | 9.4 |
| Transition | 4.9 | 4.9 |
| Management | 3.2 | 3.2 |
| Break | 1.4 | 1.4 |
| Warm-up ^a | ---- ^b | ---- |
| Subject Matter Knowledge | 16.0 | 16.1 |
| Technique | 5.9 | 5.9 |
| Strategy | 7.2 | 7.3 |
| Rules | ---- | ---- |
| Social Behavior | ---- | ---- |
| Background | 2.9 | 2.9 |
| Subject Matter Motor | 74.5 | 74.5 |
| Skill Practice | 31.1 | 31.2 |
| Scrimmage/Routine | 26.6 | 26.6 |
| Game | 8.3 | 8.2 |
| Fitness | 8.5 | 8.6 |

(Table continued)

| ALT-PE Categories | High-skilled | Low-skilled |
|---------------------|--------------|-------------|
| Not Motor Engaged | 43.6 | 52.7 |
| Interim | 1.3 | 2.0 |
| Waiting | 17.7 | 23.4 |
| Off-task | 0.3 | 0.6 |
| On-task | 5.3 | 4.9 |
| Cognitive | 20.1 | 21.9 |
| Motor Engaged | 55.4 | 47.3 |
| Motor Appropriate | 36.9 | 26.6 |
| Motor Inappropriate | 16.0 | 16.5 |
| Motor Supporting | 2.6 | 4.1 |

Note. Due to rounding, some subcategories do not sum to exactly the same value as the categories.

^aVideotaping began after warm-up activities had finished.

^bThe dashes (----) indicate no behaviors were recorded for that category.

of time high- and low-skilled soccer players were involved in various context level activities was similar. Regardless of their ability, the players spent over 9% of their time performing general, noninstructional activities. Players were in transition approximately 4.9% of the time and were involved in performing managerial tasks 3.2% of the time. Videotaping began after warm-up activities had been completed; thus, no values for the warm-up category were recorded. Players received a break or rest 1.4% of the practice time. The coach spent approximately 16% of practice time relating knowledge to her players, with about 7% of the time spent discussing strategy with her team. The players received information about skill techniques (5.9%) and some background information (2.9%) as well. No time was devoted to reviewing rules or discussing appropriate social behavior. Approximately 75% of the practice sessions were spent in subject matter motor--performing soccer skills and playing. The players were engaged in skill practice and drills approximately 31% of the time and spent 26.6% of their time scrimmaging, receiving frequent feedback from the coach. Game play represented approximately 8.3% of the practice time, and about 9% of the time was spent in fitness activities.

Noticeable differences were found in the learner involvement levels of high- and low-skilled female intercollegiate soccer players (Table 1). The low-skilled players were inactive or not engaged more often than the high-skilled players (52.7% versus 43.6%). The greatest difference was in the time spent waiting. Low-skilled players spent 23.4% of their time waiting, while high-skilled players waited only

17.7% of the time. There was little difference in the amount of time the high- and low-skilled players spent in on-task activities or listening to information from the coach. Both high- and low-skilled players spent about 5% of their time performing on-task activities. Both low- and high-skilled players exhibited few off-task and interim behaviors (about 2%).

The high-skilled players were engaged in motor activity 8.15% more of the time than the low-skilled players; the high-skilled players were actively participating 55.4% of the time compared to 47.3% of the time for the low-skilled players. The high-skilled players were appropriately engaged (ALT-PE) 36.9% of the time compared to 26.6% of the time for the low-skilled players. The high-skilled players were not appropriately engaged or unsuccessful in the performance of motor skills 16.0% of the time compared to 16.5% of the time for the low-skilled players. The amount of time spent in motor supporting behavior was higher for the low-skilled players than for the high-skilled players (4.1% versus 2.6%).

The ALT-PE/engaged ratio reflects the appropriateness of the instructional design. This ratio indicates the time the players were successful while actively involved (motor appropriate/total motor engaged). The ALT-PE/engaged ratio was 66.6% for the high-skilled player versus 56.3% for the low-skilled players.

ALT-PE Variables Day-to-Day

Selected ALT-PE variables of high- and low-skilled athletes were compared on a day-to-day basis. These comparisons

are presented in the following section.

The total time both skill groups were involved in motor activity during practice sessions varied considerably throughout the 12 videotaped practice sessions observed (Figure 1). The players were engaged in motor activity only 30 min during Practice 1 compared to 105 min during Practice 5.

The percentages for the three context level subdivisions --general content, subject matter knowledge, and subject matter motor--are shown in Figure 2. Because both high- and low-skilled athletes were involved in the same practice sessions and were participating in the same drills, the context level percentages were very similar; thus, the percentages shown represent the average percentage for both groups.

General content, that is the amount of time spent in transition, management, and breaks, was similar for both high- and low-skilled athletes (Figure 2). A gradual increase occurred during the first five practice sessions followed by a gradual decrease until Practice 9, when both skill groups demonstrated a steady increase in general content.

No significant differences among the high-skilled and low-skilled athletes on a day-to-day basis were found in the amount of time spent learning subject-related knowledge (Figure 2). Technique, strategies, and background information was given intermittently to both groups throughout the 12 practice sessions observed.

Subject matter motor or the amount of time athletes spent in scrimmage, practicing skills, fitness, and game play was very similar for both skill groups (Figure 2). Subject matter

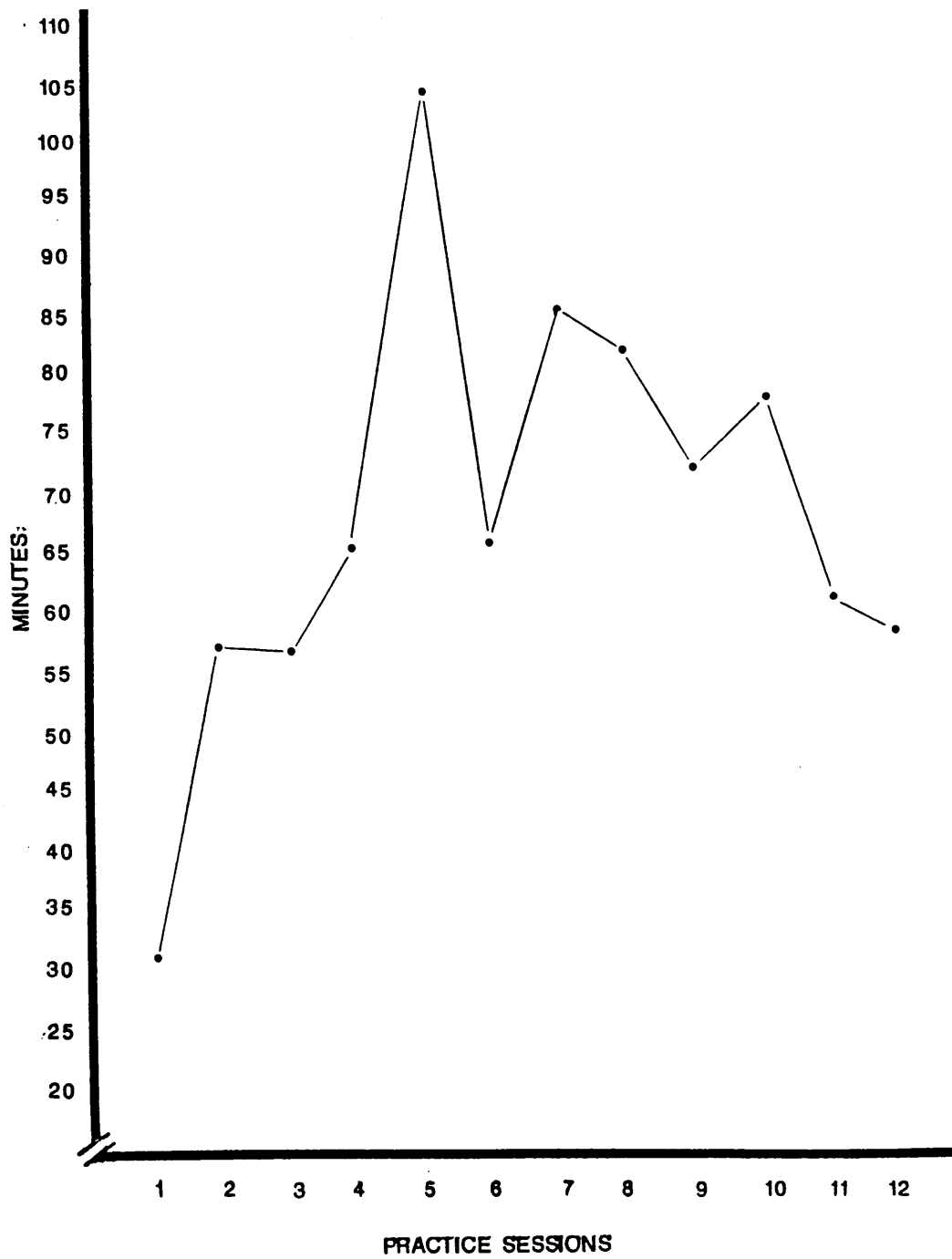


Figure 1. Total time for high-skilled and low-skilled athletes on a day-to-day basis.

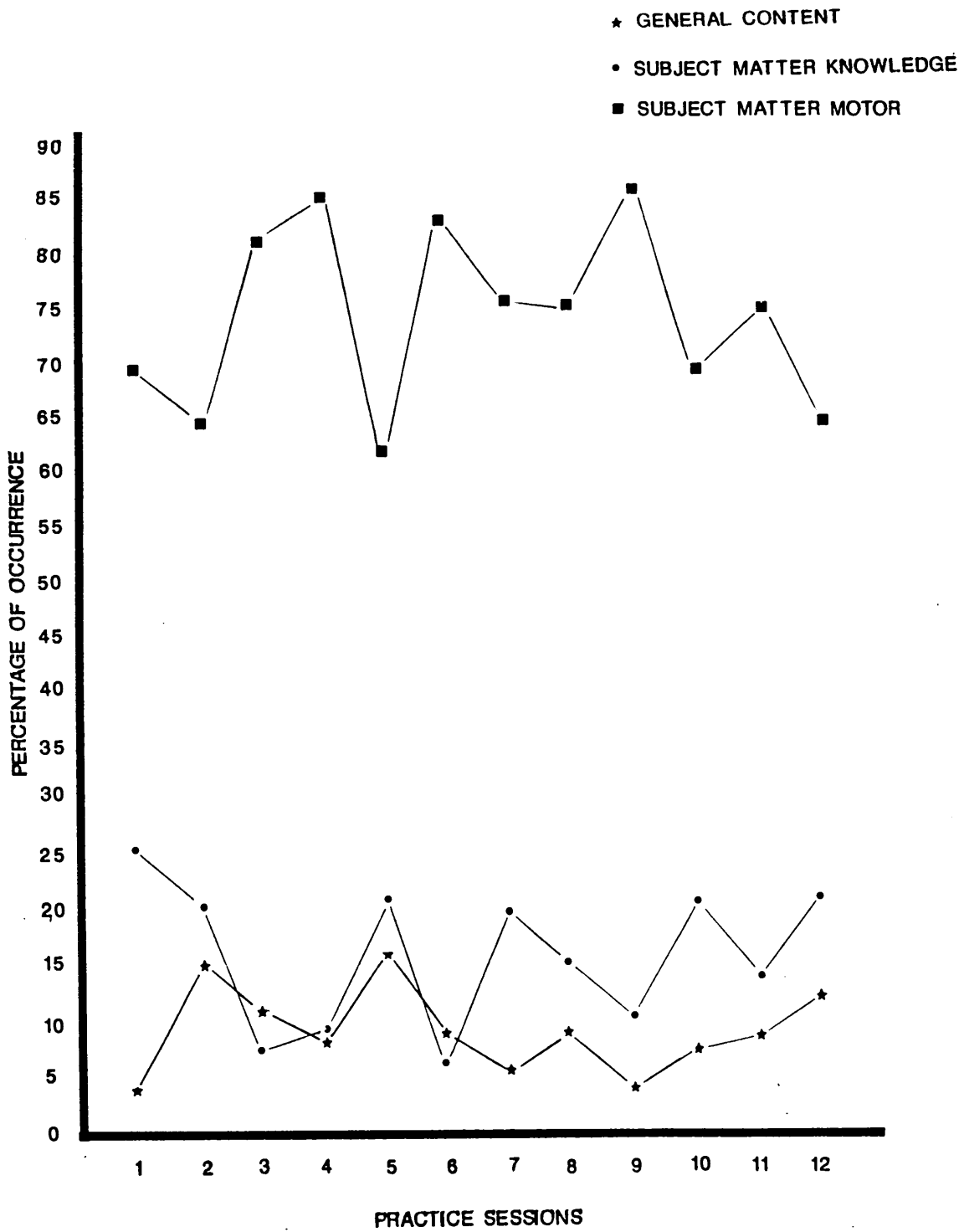


Figure 2. Context level percentages for the high-skilled and low-skilled athletes on a day-to-day basis.

motor activities occupied the majority of time in all practices, and ranged from a low of 60% on Day 5 to a high of 84% on Day 9.

The female intercollegiate soccer coach's high- and low-skilled athletes' daily not-motor engaged percentages were compared as shown in Figure 3. The amount of time low-skilled athletes were not engaged in performing motor skills on a day-to-day basis was, on the average, 9.1% higher than the high-skilled athletes' percentages. The greatest disparity was shown on Day 2 where the low-skilled athletes were not-motor-engaged 26.7% more than the high-skilled athletes, (61.5% versus 34.7%). On Day 10, both low-skilled and high-skilled athletes were close in non-active participation (55.4% versus 53.6%). After practice session 4, both skill groups followed similar patterns.

Motor engaged percentages for high-skilled female intercollegiate soccer players were compared on a day-to-day basis and are displayed in Figure 4. The high-skilled athletes were motor-engaged a higher percentage of time throughout all 12 practice sessions videotaped. Similar patterns of increasing and decreasing motor engagement were demonstrated with both skill groups. The greatest disparity was shown on Day 3 and Day 6 (61.0% versus 50.0% and 65.6% versus 54.3%, respectively).

ALT-PE percentages for high- and low-skilled female intercollegiate soccer players were compared on a day-to-day basis (Figure 5). While the percentages for both groups were not equal, the groups demonstrated a similar pattern. The high-skilled athletes showed the highest ALT-PE during Practice

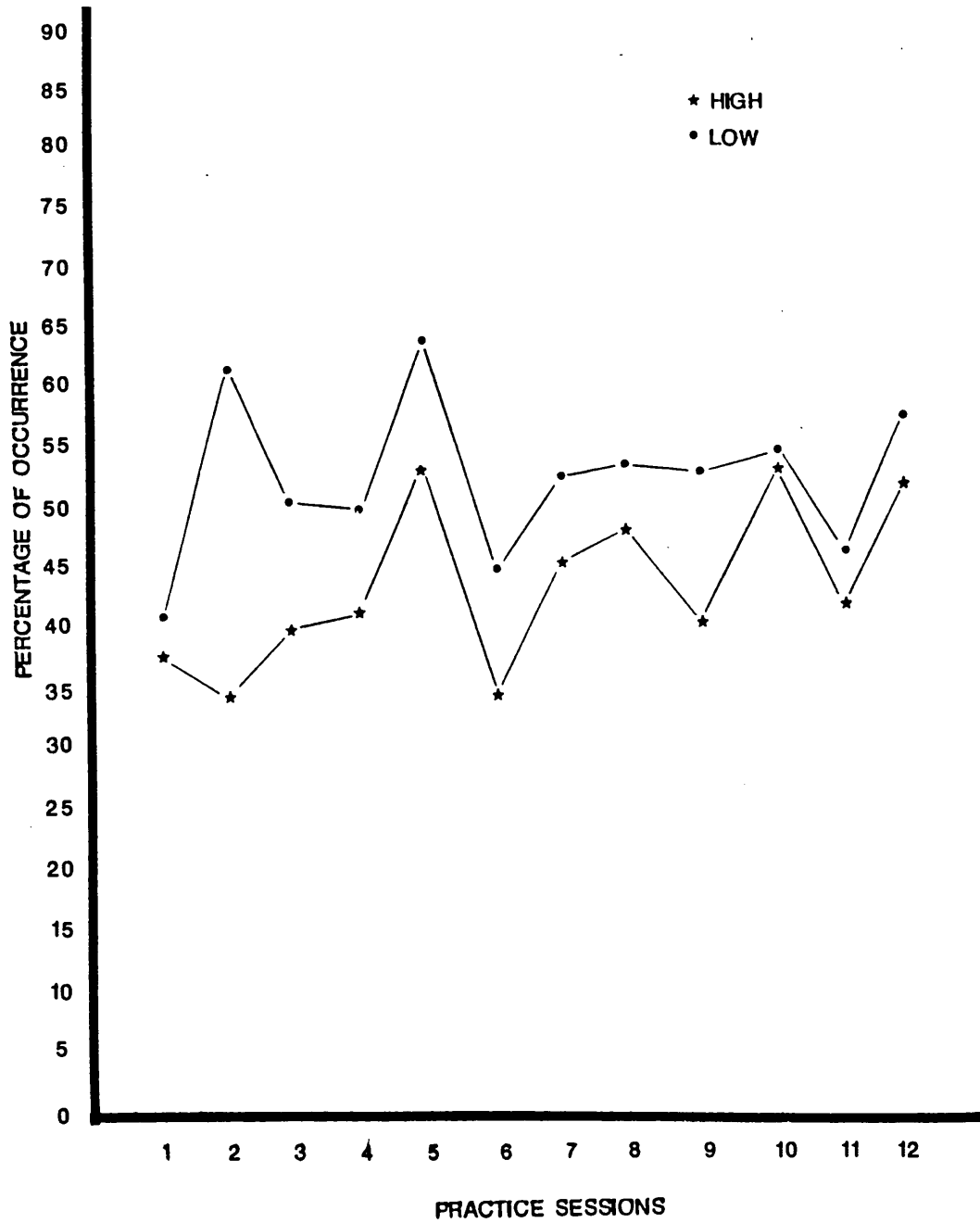


Figure 3. Not-motor-engaged percentages for high-skilled and low-skilled athletes on a day-to-day basis.

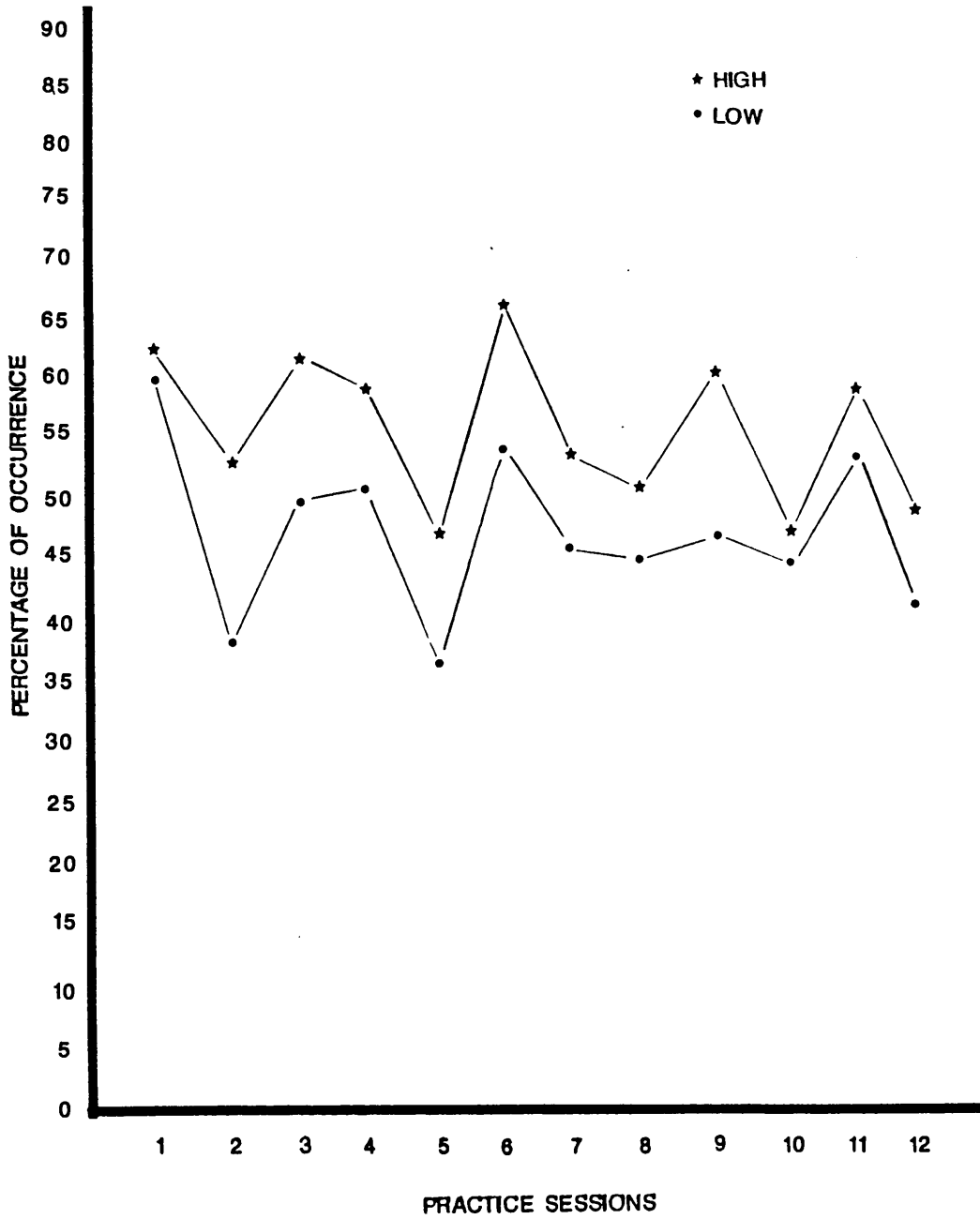


Figure 4. Motor-engaged percentages for high-skilled and low-skilled athletes on a day-to-day basis.

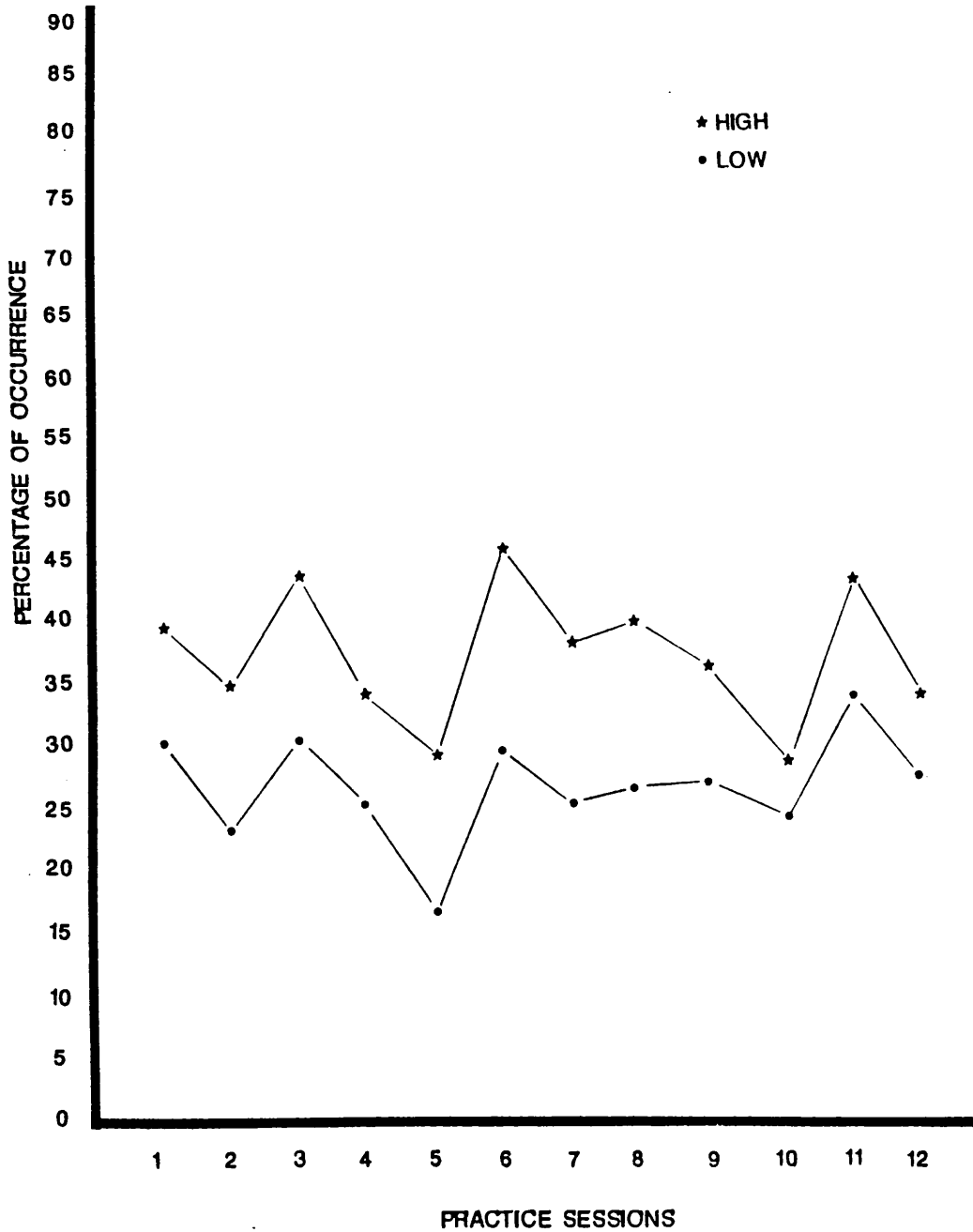


Figure 5. ALT-PE percentages for the high-skilled and low-skilled athletes on a day-to-day basis.

6 (46.3%), while the low-skilled athletes demonstrated the lowest ALT-PE during Practice 5 (17.3%). Both skill groups were closest in motor appropriate behaviors during Practice 10 where a disparity of only 3.6% was demonstrated (28.3% versus 24.7%).

The ALT-PE/engaged ratio revealed the portion of practice time the athletes were successful while they were actively participating (motor appropriate/total motor engaged). Ratios, expressed as percentages, for the high- and low-skilled athletes on a day-to-day basis are shown in Figure 6. The high-skilled athletes had greater success on a day-to-day basis than their low-skilled peers. The low-skilled athletes followed a similar pattern of increases and decreases but at a lower level. The high-skilled athletes showed the highest ALT-PE/engaged ratio during Practice 8 (76.3%) and the low-skilled athletes, the highest ratio during Practice 11 (63.8%). The low-skilled athletes demonstrated the lowest ALT-PE/engaged ratio during Practice 5 (47.1%), while the high-skilled athletes demonstrated the lowest ratio during Practice 10 (59.6%).

Visual analysis of the data revealed several significant differences between the ALT-PE categories recorded for both skill groups throughout the season as well as on a day-to-day basis. These differences in ALT-PE between high-skilled and low-skilled female intercollegiate soccer players led to the rejection of the null hypothesis that stated there would be no significant differences in the ALT-PE of female varsity soccer players with high-skill ability and female varsity soccer

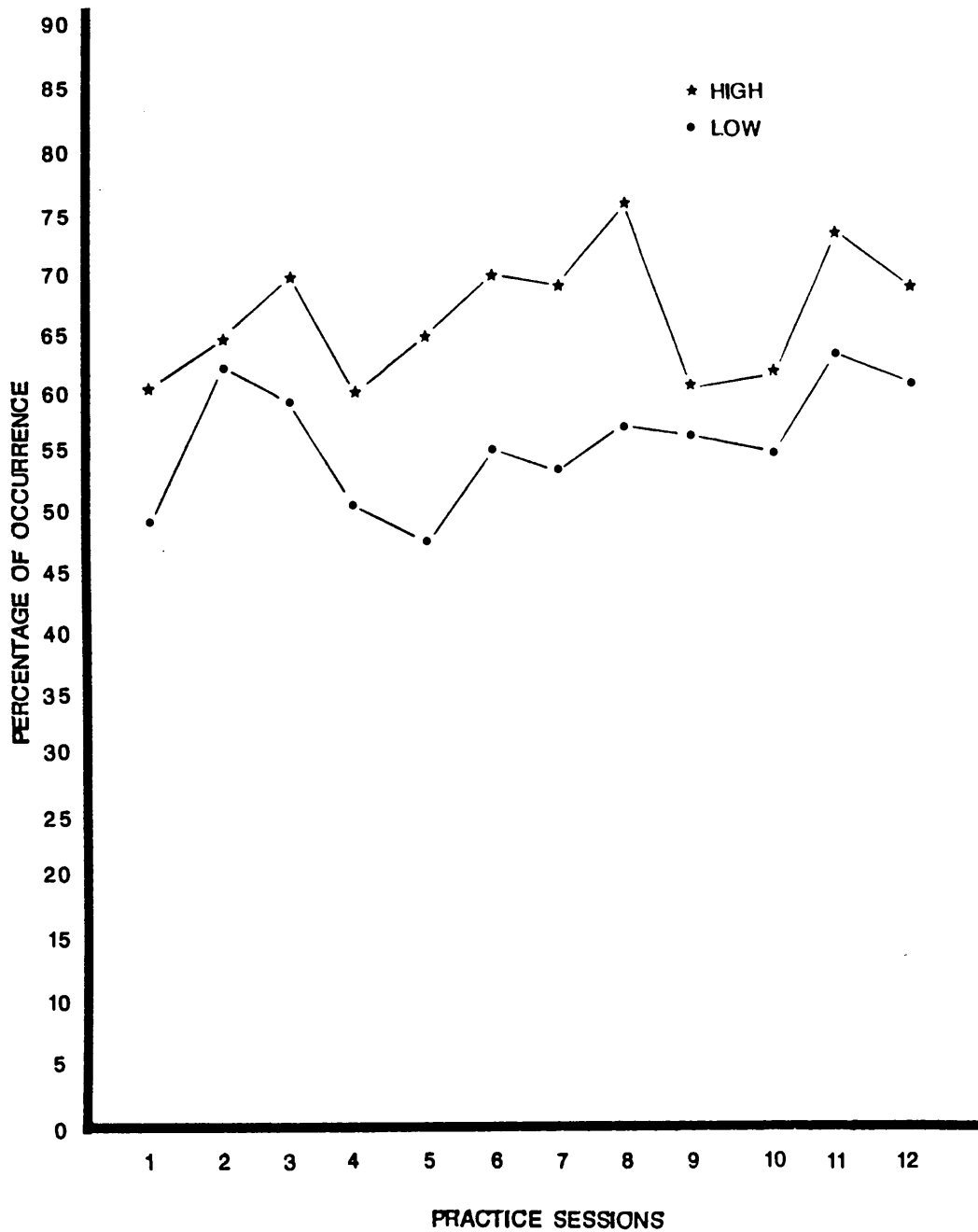


Figure 6. Daily ALT-PE/engaged ratio for the high-skilled and low-skilled athletes.

players with low-skill ability.

Summary

Results obtained when comparing the Academic Learning Time-Physical Education (ALT-PE) of high- and low-skilled female intercollegiate soccer players were presented in this chapter. The revised ALT-PE instrument of Siedentop et al. (1982) was used to describe the context levels and learner involvement levels of the players.

IOA scores for this study were calculated using the scored-interval method (Hawkins & Dotson, 1975). Four randomly selected videotapes were coded at two independent coding sessions by Dr. Victor H. Mancini, an expert in descriptive-analytic studies. IOA scores ranged from 93.7% to 100% which were sufficient to indicate the coder was reliable.

Visual comparison of the ALT-PE data in Table 1 revealed no significant differences in the context levels of high- and low-skilled female intercollegiate soccer players. Regardless of ability level, the players spent approximately 9.5% of their time performing general, non-instructional activities. Approximately 75% of practice sessions were spent in subject matter motor activity--performing soccer skills and playing. About 9% of the time was spent in fitness activities.

At the learner involvement levels, significant differences were found between the high- and low-skilled soccer players. The high-skilled players were engaged in motor activity 8.2% more of the time than the low-skilled players; the high-skilled players were more actively participating 55.4% of the time compared to 47.3% of the time for low-skilled players. During

the time of active involvement, the high-skilled players were more successful in performance of motor tasks than the low-skilled players, accruing more ALT-PE (36.9% versus 26.6%). The high-skilled players also spent less time waiting (17.7% versus 23.4%) and less time involved in cognitive tasks (20.1% versus 21.9%) than the low-skilled players.

Figures 1-6 give comparisons of the ALT-PE variables on a day-to-day basis for the 12 practice sessions. Visual comparisons of these results indicated differences among high- and low-skilled female intercollegiate soccer players throughout 12 observed practice sessions at the learner involvement levels. While the percentages for both groups were not equal, the groups demonstrated similar patterns. The low-skilled athletes followed similar patterns of increases and decreases but at a lower level.

Chapter 5

DISCUSSION OF RESULTS

This study compares the ALT-PE of high-skilled and low-skilled female intercollegiate soccer players. 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 level of high- and low-skilled female soccer players. These results were predictable when one realizes that the coach dealt with her team as a single unit. She did not organize her practice sessions in a manner that allowed different athletes within the group to perform different activities at the same time. Practice sessions were organized in such a manner that all players of both skill abilities would be engaged in context level activities simultaneously. One category at the context level, warm-up activities, was a part of the daily practice sessions but was not videotaped for this study.

Although few differences were evident at the context level, significant differences occurred in the player's learner involvement levels. Results of this investigation suggest that disparities existed in the opportunities provided for low- and high-skilled female intercollegiate soccer players. Low-skilled athletes had fewer opportunities to actively participate during practices than high-skilled athletes as indicated by the amount of motor engagement recorded (47.3% versus 55.4%). Much of this difference was accounted for by the amount of time the

low-skilled athletes spent waiting; the low-skilled players spent 8.2% more of their practice time waiting. This waiting time occurred when low-skilled athletes were in line for drills, preceding scrimmages, and prior to starting game play. Low-skilled players were inappropriately motor engaged less often, accruing less ALT-PE. They also engaged in more motor inappropriate behavior.

The appropriateness of the instructional design of the practice was reflected in the ALT-PE/engaged ratio. This ratio indicates that proportion of time players were successful during the time they were actively involved or motor engaged. The mean ratio for high-skilled athletes was 67%, and the mean ratio for low-skilled athletes was 56%. This indicates that the high-skilled athletes were successful two-thirds of the time, while the low-skilled athletes were successful only slightly more than half the time. The data indicate that practices were designed by the coach to meet the needs and to challenge the higher skilled athletes.

On a day-to-day analysis, when percentages for motor engaged behavior, not-motor engaged behavior, and ALT-PE are reviewed simultaneously, Practice 6 was the most appropriately motor engaged session. During this session, both skill groups were appropriately motor engaged with soccer-related material. Practice 6 may be considered "ideal" with both low- and high-skilled athletes appropriately motor engaged for high levels of time; however, this may not be attainable during every practice session. Overall, the day-to-day data suggest that perhaps the coach should organize her practices to allow

greater opportunities for both skill levels to practice soccer-related drills and skills. Utilizing more game-like soccer situation drills, providing more practice trials, and using smaller groups could facilitate additional opportunities for both skill groups to practice soccer-related drills and skills.

Several explanations can be offered for the low-skilled players' accrual of less ALT-PE. One possible explanation for the low-skilled players' accrual of less ALT-PE during practice sessions can be directly related to the ability levels of the players. High-skilled players, by definition, were more skilled; therefore, it is logical that these players would be more successful (as evidenced by their higher ALT-PE levels) than low-skilled players. Another explanation for high-skilled players' higher ALT-PE levels may be the fact that high-skilled players were used more frequently by the coach to demonstrate and to start drills and scrimmage activities. Low-skilled players also spent longer periods of waiting, which may have been responsible for low-skilled players' lower levels of success (ALT-PE). A greater amount of waiting time indicates that low-skilled players probably received fewer trials during skill-related activities, and, therefore, the low-skilled players received fewer opportunities to improve their skills. This would account for their lower ALT-PE levels and motor-engaged times. It may be reasoned that the coach found her practices ran more smoothly and more successfully when her high-skilled athletes were more involved.

The utilization of systematic observation instruments, such as the ALT-PE instrument, has assisted coaches/physical

educators in becoming more aware of how they interact with their players/students of different abilities and how to better organize their practices/lesson plans. Data from this study suggest that the coach developed practice sessions to favor the development of the high-skilled players; this is supported by the ALT-PE/engaged ratio. The data also suggested that the coach should develop a stronger learning environment for the low-skilled players. Low-skilled players spent greater amounts of time waiting and were not engaged more often than high-skilled players. The coach must involve and incorporate the low-skilled players more often in drills and scrimmages and decrease the amount of time they spend waiting. This could be accomplished by utilizing different activity stations for different skill levels, by providing more activity stations, and by using more equipment. These improvements would aid the coach in developing a more overall effective and skilled team, as well as provide depth and team unity.

Overall, these findings concur with those of Rosenthal and Jacobson (1968) who concluded that teachers/coaches give differential treatment to individuals based on their expectations of those individuals. Pieron (1982) indicated that the gap in performance between students of different abilities would widen because high-skilled students were more productively engaged in activities during class. In all, it seems logical to conclude that the gap in performance between low- and high-skilled athletes would be affected in a similar manner. Consequently, in order to reduce the gap in performance, coaches need to prepare their practice sessions

to include skill progressions that will allow lesser skilled athletes to experience success and improve their skills to a level of their higher skilled teammates.

The original ALT-PE instrument of Siedentop et al. (1979) has been utilized in practically all ALT-PE studies to date. The revised ALT-PE instrument of Siedentop et al. (1982) was employed in this investigation and is similar to the original system in several ways. Because of change in categories and major subdivisions, direct comparisons between this investigation and investigations using the original instrument should be made cautiously. Therefore, with this in mind, the rest of this chapter will discuss this investigation's results in comparison to the conclusions of similar studies.

The results of this study can be compared to those of Thomas et al. (1984), van der Mars et al. (1984), and Shields (1984) who examined the ALT-PE of high- and low-skilled athletes. Thomas et al. (1984) utilized the revised ALT-PE instrument to compare high- and low-skilled male and female collegiate lacrosse players. No significant differences were discovered at the context level; however, significant differences were found at the learner involvement level. Thomas et al. also indicated that high-skilled athletes were motor engaged more often, accrued more ALT-PE, and waited less often than their low-skilled teammates. The findings of this investigation were congruent to those found by Thomas et al. (1984).

Van der Mars et al. (1984) compared the ALT-PE levels of high- and low-skilled male high school basketball players.

Results indicated that the low-skilled player accrued less ALT-PE and spent more time waiting than the high-skilled player. These findings concur with those of the present study.

Shields (1984) also used ALT-PE to compare high- and low-skilled female collegiate soccer players. As with the present investigation, the coach devoted a similar amount of time to general, noninstructional activities, and both skill groups received similar amounts of soccer-related knowledge and motor activity. Significant differences were discovered in the involvement of the high- and low-skilled athletes during these activities. Results indicated that high-skilled soccer players had more opportunity to actively perform soccer skills and were more successful and effective (ALT-PE) in performing those skills than their low-skilled teammates. Low-skilled athletes spent more time waiting than their high-skilled teammates. These findings concur with those of the present investigation.

Other researchers (Pieron, 1982; Ryan, 1983; Smith, 1983) have utilized the ALT-PE instrument to compare the involvement of high- and low-skilled students during physical education classes. Pieron (1982) used ALT-PE to study the effects of teachers' expectations on learners' involvement. The investigator found that high-achievers accrued significantly greater amounts of ALT-PE than did low-achievers when observed in gymnastics and volleyball activities. Ryan (1983) compared the ALT-PE of high-, average-, and low-skilled elementary students, and Smith (1983) studied the ALT-PE of high- and low-skilled male and female secondary students. Both investigators discovered that high-skilled students spent more time engaged

in motor activities, waited less, and accrued more ALT-PE than their low-skilled peers. The results of the present study concur with findings of Pieron (1982), Ryan (1983), and Smith (1983).

The ALT-PE of athletes while engaged in basketball, wrestling, gymnastics, tennis, and baseball activities was observed by Rate (1981). Rate concluded that 90% of practice time was spent in content-PE. The average amount of ALT-PE for all sports was 49.3%. Although the revised ALT-PE instrument did not have a category for content-PE, the percentages obtained for subject matter knowledge and subject matter motor in this study may be combined to provide an estimate of time spent in content-PE activities. The athletes in the present study spent approximately 90.6% of their time in content-PE or soccer-related activities. This was similar to the 90% reported by Rate. The average ALT-PE of high-skilled and low-skilled soccer players in this study was 31.8%, which was much lower than the average ALT-PE of all sports (49.3%) reported by Rate.

Hoffman (1981) utilized the DAC systematic observation instrument to analyze a male intercollegiate coach's and a female intercollegiate coach's interactions with their lacrosse players of different abilities. No direct relationships can be established between the two investigations because of the use of different observation instruments. However, the conclusions of the present study paralleled Hoffman's findings in the fact that players labeled high-skilled by their coach appeared to experience more advantageous conditions than their

low-skilled teammates. Hoffman found that high-skilled athletes received more support and information from their coaches. Results of the present study indicated that high-skilled athletes experienced more motor involvement, were more successful, and spent less time waiting than their low-skilled teammates. The coaches in both studies favored their high-skilled athletes, either through 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 nonstarting players. Results indicated only minor differences in coaches' behaviors toward athletes of different abilities. Unlike this investigation, Boyes found no significant differences existing between treatment received by the high- and low-skilled players.

Information concerning the achievement and actions of intercollegiate female soccer players of different ability levels was provided by the ALT-PE data from this study. Systematic observation systems, such as ALT-PE, can be very helpful in aiding the coach in using the time allocated for practice more effectively. The coach can utilize this information to reorganize activities, design different tasks and special drills for athletes of different abilities, and use different progressions for each ability group in an effort to maximize the amount of ALT-PE accrued by players of different ability levels.

Summary

No differences were found in the context levels of the high- and low-skilled female varsity soccer players. These

results may be attributed to the coaching methods employed by the coach. Significant differences between high- and low-skilled female varsity soccer players existed at the learner involvement level. These findings led to the rejection of the null hypothesis.

A number of explanations for the results in this investigation can be offered. The fact that high- and low-skilled athletes had almost identical data at the context level is explained by the statement that the coach treated the team as a single unit. Low-skilled players accrued less ALT-PE than high-skilled players. It was likely that the superior ability of the high-skilled players contributed to their being more involved and successful (ALT-PE) than the low-skilled players during practice sessions. The low-skilled players also waited longer than the high-skilled players. The longer waiting time experienced by the low-skilled players during practices may be related to their low success levels (ALT-PE). While waiting, low-skilled players received less trials and, therefore, received fewer opportunities to improve their skills. High-skilled players were motor engaged 55.4% of the time compared to 47.3% of the practice for low-skilled players. These results might be explained by the coach utilizing her high-skilled players more often in drills, demonstrations, and scrimmage situations.

The ALT-PE systematic observation instrument can be a very useful tool in aiding the coach in utilizing the time allocated for practice more effectively. In order to maximize the amount of ALT-PE accrued during practice sessions by players of

different ability levels, the coach may want to design different tasks, reorganize activities, or use different progressions for athletes of different skill ability.

The findings of this investigation concur with the findings of other researchers (Hoffman, 1981; Pieron, 1982; Rate, 1981; Shields, 1983; Smith, 1983; Thomas et al., 1984; van der Mars et al., 1984) regarding the opportunities provided to athletes and students of different ability levels. The results of this investigation supported the contention that coaches treat their athletes differently according to their skill ability.

Chapter 6

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS FOR FURTHER STUDY

Summary

The purpose of this study was to determine if differences existed between the ALT-PE of high-skilled and low-skilled female intercollegiate soccer players. Twelve varsity female soccer players and their female coach from a central New York college served as subjects. Twelve practice sessions during the 1984 season were videotaped. Following the season, the coach ranked her athletes from high to low according to overall playing ability. The top six ranked players were classified as high-skilled, and the bottom six ranked players were classified as low-skilled. The 12 videotapes of the practice sessions were coded using the revised ALT-PE instrument of Siedentop et al. (1982). The ALT-PE data from practices were manually scored and percentages calculated for each ALT-PE category. Descriptive statistics were calculated, and visual comparisons were made between the two groups.

Visual analysis of the data revealed no significant differences in the context levels of high- and low-skilled female intercollegiate soccer players. However, significant differences were found in the learner involvement levels. The high-skilled players were more frequently engaged in motor activity, accrued more ALT-PE, spent less time inappropriately engaged, and waited much less than their low-skilled teammates (see Table 1). Visual comparison of data showed variability

in day-to-day practices. Both skill groups demonstrated similar patterns of behavior, with the high-skilled athletes at a higher level than the low-skilled athletes. The differences in accrued ALT-PE between high- and low-skilled female soccer players led to the rejection of the null hypothesis that stated there would be no significant differences in accrued ALT-PE between high-skilled and low-skilled female intercollegiate soccer players.

Conclusions

The results of this study led to the following conclusions regarding the ALT-PE accrued by high-skilled and low-skilled female intercollegiate soccer players:

1. The coach devoted the same amount of time to general, noninstructional activities. Both high- and low-skilled players received the same amount of soccer-related knowledge and motor-activity; however, significant differences were found in the involvement of the high- and low-skilled players during these activities.

2. High-skilled soccer players had more opportunity to actively perform soccer skills than their low-skilled teammates.

3. High-skilled players were more successful and effective (ALT-PE) in performing soccer skills than their low-skilled teammates.

4. Low-skilled players spent more time inactively waiting to participate in an activity.

5. The coach treated her high-skilled and low-skilled players differently.

Recommendations for Further Study

The following recommendations are suggested for further study:

1. A follow-up study to examine the effects of instruction and supervision in interaction analysis on the ALT-PE of soccer players.

2. A follow-up study to examine the effects of various intervention strategies on soccer players' ALT-PE.

3. A study to determine if soccer players of successful and less successful coaches have different amounts of ALT-PE in practice.

4. A similar study using high- and low-skilled male intercollegiate soccer players who are coached by a male coach could be conducted.

Appendix A
INFORMED CONSENT FORM
ATHLETE'S COPY

The purpose of this investigation is to compare the Academic Learning Time-Physical Education (ALT-PE) of high-skilled and low-skilled female intercollegiate soccer players throughout the course of the season. ALT-PE is that portion of practice time that an athlete spends in motor activity that is appropriate for her ability level. The resulting information may prove useful in improving the ALT-PE made available to players in a practice session and may assist the coach in planning for equal opportunities for all players.

The subjects are 12 varsity female soccer players and their female coach. Subjects will be videotaped for 12 entire practice sessions during the course of the 1984 soccer season. The coach will be asked to wear a wireless microphone. The normal actions of the players and their coach will not be interrupted. The videotapes will be coded using the revised ALT-PE instrument by a trained observer. At the end of the season the coach will be asked to rank her players from high to low according to overall playing ability.

The top six ranked players will be designated as high-skilled, and the bottom six ranked players will be designated as low-skilled. These target students will be observed on an alternating interval basis.

It is assured that the names in this study will be kept strictly confidential. Videotaping is solely for the purpose of this study and the videotapes will only be available to the researcher and the coach 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.

Signature

Date

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