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Wilson, Anne Elizabeth, Ph.D.
The Ohio State University, 1988
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Application of Multiple Behavioral Procedures in Junior High School Sport

DISSERTATION

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

By

Anne F. Wilson, B.S.

The Ohio State University

1988

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DEDICATION

To Poppa
ACKNOWLEDGEMENTS

I would like to express my sincere thanks to the following individuals for their help during the course of my graduate studies:

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VITA

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on Sport Behavior: An Alternative View." Journal of Sport

Fields of Study

Major Field: Applied Behavioral Sciences
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CHAPTER I
INTRODUCTION

The field of sport behavior analysis is in its infancy. The development of applied behavior analysis in sport began with the publication of Rushall and Siedentop's, "The Development and Control of Behavior in Sport and Physical Education" (1972), a book which provided coaches with outlined behavioral strategies to be used in sport environments. In this book, many examples were given for shaping new sport skills, managing contingencies to maintain existing skills at high levels, and generalizing practiced skills to competitive settings. The earliest published research on the application of applied behavior analysis to sport is Rushall and Pettinger's 1969 study on the effects of various reinforcement contingencies on the number of laps swum by age-group swimming team members.

Although sport behavior analysis began only in the early 70's, behavioral strategies in sport have been applied to such diverse problems as the reduction of anxiety brought on by pressure during competition for youth athletes and improving the skills of beginning golfers to mental control for elite athletes. Orlick and Botterill (1975), concerned with the effects of the pressure to win on youth athletes, published a book that stressed the need for behavioral
coaching methods to increase the level of fun and enjoyment for the youth athletes participating in sport. Martin and Hrycaiko (1983) published a collection of articles on the concerns of coaches of youth athletes. They reviewed the application of behavioral principles to youth sports and outlined in detail the manner in which coaches may be most effective in their use of these techniques. Simek and O'Brian (1981) provided a useful procedure for building the skills of beginning golfers. In their book they described the successful use of immediate feedback and setting of goals to improved the performance of beginning golfers.

Books and articles have been published that deal with self-control or behavior self-modification for the athlete. Orlick (1980) recommended strategies for the elite athlete that included coping self-statements, progressive relaxation, realistic goal-setting strategies, and mental rehearsal of the athletes "best" performances.

The procedures available for use in the sport setting by a behavioral sport psychologist are many, some of which include progressive relaxation, mental rehearsal, goal-setting, and performance feedback. All of these interventions are not appropriate for use in all situations and with all levels of athletes. Higher level athletes may find the use of a mental rehearsal technique helpful, but reinforcement for attending practice inappropriate. However, for the many athletes who are just beginning in their sport there may be a great need for the use of a reinforcement technique to improve attendance to practice so that skill levels may be improved. A sport
behavior analyst should be able to provide effective behavioral change techniques at all levels of athletic skill.

Coaches of youth athletes often experience a wide range of problems throughout the course of a team practice and competitive season. These problems range from "housekeeping" problems (e.g., bring your uniform to school on game days) to skill development problems (e.g., shooting free throws with some consistency in success rate and form).

Although the need is great, research is seldom conducted in the development of a complete and systematic approach to helping a sport team to improve. Applied behavior analysis in sport should be able to respond to the needs of a coach and a team throughout the season with a variety of interventions that solve problems quickly and in a reasonably cost effective manner for the coach. Unfortunately there is little evidence of this type of "client centered" research in sport, especially with young inexperienced athletes. Applied behavior analysis in sport has frequently focused on the behaviors of skilled athletes (Heward, 1978; McKenzie & Rushall, 1974; Rushall & Pettinger, 1969; Rushall & Smith, 1979) and on skill development and strategy execution in younger athletes (Allison & Ayllon, 1980; Buzas & Ayllon, 1981; Komaki & Barnett, 1977; Simek & O'Brian, 1978). Applications with young athletes have taken as dependent variables skill improvement and execution of strategy in practice sessions. Little focus has been given to the needs and concerns of the athlete or coach. In the rush to test a theory or demonstrate the effectiveness of a technique, concerns and problems of the client are frequently overlooked.
Researchers often approach the sport environment with a pre-set agenda and pre-determined problem behavior, rarely do the athletes or coaches select or guide in the selection of the dependent variable. An applied behavior analysis in sport should be able to provide a complete and programmatic approach to helping a sport team improve.

That both sport and applied behavior analysis share the fundamental characteristic of accountability may explain why behavioral interventions are so applicable to the sport environment. Within a very short time span sport behavior analysis has developed and proven itself useful in a wide area of application in sport.

1.1 APPLICATIONS OF SINGLE SUBJECT RESEARCH TO SPORT

Sport provides a natural and logical area of research in which to use single subject designs and analyses. Sport is composed of behaviors, or skills, demonstrated through competition. It is the comparison of the level of skill demonstrated by one individual with another, at a particular point in time, which determines the outcome of a competition. Sport is an absolute unit based phenomena; that is, the behavioral outcome or components of a competition can be measured in terms of the dimensional quantities of latency, duration, countability. Every instance of behavior may be characterized by the temporal location of its occurrence relative to other environmental and/or behavioral events, and the time required for its occurrence. Any series of such instances possesses denumerability, and the instances are, therefore, countable (Johnston & Pennypacker, 1980, p.123-24).
All single subject research is conducted at the level of the individual, just as all sports, even team sports, are ultimately performed at the level of the individual. Applied behavior analysis and single subject research designs provide an already existing science well suited to answer questions at the level of the individual athletes experience.

1.2 THE EFFECT OF TITLE IX ON FEMALE COACHING

Title IX of the Education Amendments of 1972 is the first comprehensive legislation designed to protect students from sex discrimination. In part, the law states that,

No person in the U.S. shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal Financial assistance... (P.L. 92-318, 20 USC Section 1681, 1972)

The interpretation of Title IX in physical education classes meant that all classes had to be co-educational except classes in contact sports and physical education. In sports club activities, the Department of Health, Education and Welfare guidelines required that schools provide equal opportunity for both sexes to participate in interscholastic, intercollegiate, intramural and club athletic programs (East, 1978, p. 213). If the school had separate teams, the division of equipment or supplies may not be made on the basis of sex. Equal opportunity to participate and equal access to the equipment necessary to practice and compete is required by law in all sport programs in schools that receive federal assistance.
Title IX would seem to have brought across the board equality to women in all aspects of athletic competition, however, one area of sport participation has yet to experience the equality legislated by P.L. 92-318. While female athletes have indeed responded to the broader range of opportunities to compete in sport, the number of women placed in head coaching positions has declined since 1972. Following the implementation of Title IX, the total number of intercollegiate coaching positions for female teams had increased 37% between 1974 and 1979, however the number of intercollegiate female head coaches had dropped 20% while the number of male head coaches had increased 173% during the same time period (Holmen & Parkhouse, 1981). According to one study (Mathes, 1982), only 12% of the basketball coaches of girl's teams were females. When a broader range of sports were examined, only 6% of the girl's team coaches were women (Acosta & Carpenter, 1985). While Title IX has increased women's opportunities to participate in sports there has also been a decline in the number of coaching positions held by women.

The problem of decline in the number of female coaches is apparent and demonstrable. Attention and research should now be concentrated on how to reverse this trend in women's athletics. Sport behavior analysis can contribute to the retention of female coaches, albeit indirectly, by providing empirically based research methods that eliminate those problem behaviors experienced by female coaches when working with female athletes thereby improving the coaching skills of the female coach. Sport behavior analysis may also help retain those
who are about to become former coaches by improving the level of motivation and increasing the skill advancement of athletes through the use of immediate feedback, inter-squad competition, and accountability.

While sport behavior analysis may provide empirically based research upon which to train and motivate female coaches, the lack of the opportunity for the development of a sport background for women in current society will continue to be a major barrier for women who seek to advance themselves in sport. A change in societal norms can not be legislated, but must occur over time and within the social milieu.

1.3 PURPOSE

The primary purpose of this study was to investigate the application of behavioral strategies as problem solving techniques when applied to all areas of the sport environment for 15 members of a junior high school girls' basketball team and their coach.

The second purpose of this study was to determine if the direction and level of research currently conducted in sport psychology is appropriate for solving the problems of coaches and athletes below the elite level. Most of the athletes in our society are beginning or novice athletes, few reach the level of the elite athlete, yet the elite level of performance seems to be the focus of much research in sport psychology.
1.4 RESEARCH STUDY AREAS

The research questions investigated in this study were those areas that were identified by the coach as problem behaviors for the athletes throughout the season. A pre-season conference with the coach identified two areas of problem behaviors for these athletes. However, by the end of the season eight areas of problem behavior had been identified. Each of the eight areas described below in sections 1.5 - 1.12 became a target for intervention.

1.5 CONTRACTING FOR ATTENDANCE

The problem behavior in this study was the rapid decrease in attendance to practice for a female athlete. Absence from practice prevented the development of the natural contingencies of reinforcement for this athlete.

1.6 APPROPRIATE GAME DRESS

The problem behavior in this study was the lack of appropriate game dress for all players to both home and away games. Inappropriate game dress prevented the use of a given player in the game.

1.7 SHAPING FOUL SHOOTING

The problem behavior in this study was the inability of three of the third string members of the team to shoot foul shots from the line. The lack of this skill prevented substitution of these players into a
The problem behavior in this study was the lack of consistency in the performance of athletes at the foul line. These team members had learned the skill of shooting a successful foul shot, but lacked the consistency necessary for reliable performance of the skill.

The problem behavior in this study was an increase in the use of punishing verbal behavior from the coach to the players and a seeming increase in the level of punishing verbal behavior between players. Punishing verbal statements were aversive to the individual and encouraged the development of divisions and cliques in the team.

The problem behavior in this study was the lack of involvement in the competition on the floor by members of the team who remained on the bench for most or all of the game. When those players on the bench were called into the game they often had no idea of which opponent they were to match up with or even what the score was.
1.11 **ON TIME TO PRACTICE**

The problem behavior in this study was the lack of prompt attendance to practice by members of the team. The Coach indicated that she would rarely find all players present and dressed for practice at the scheduled start of the practice session.

1.12 **INCREASING "HUSTLE" DURING PRACTICE**

The problem behavior in this study was the lack of "On-task" behavior and the presence of "Off-task" behavior for the team during practice sessions. The coach defined "On-task" as; watching the action on the floor during practice, not sitting or leaning during practice, not talking to other players except to encourage them in practice, listening to the coaches' instructions, not walking between drills, and not getting a drink unless given permission to do so. The coach defined "Off-task" behaviors as the opposites of each point of the "On-task" behaviors.

1.13 **SIGNIFICANCE OF THESE STUDIES**

The research study areas presented in this dissertation will provide physical educators, coaches, sport psychologist, and athletes at all levels of skill with information based on research in the applied setting. It is hoped that research conducted in an applied setting will encourage adoption of behavioral procedures in this and other sport settings. The approach used in this research lead to the identification of problem areas that transcend the specific sport in
which these studies were conducted (e.g. getting players to practice on

time). The demonstration of the effectiveness of behavioral procedures

in solving these problems will encourage the use of these procedures in

other sport settings thereby increasing the level at which physical

educators, coaches, sport psychologists, and athletes enjoy, achieve,

and participate in all sport.

1.14 LIMITATIONS

1. These results may not generalize to female basketball players at

the high school, college, or professional level.

2. These results may not generalize to male basketball players at

the junior high school, high school, college, or professional level.

3. The researcher acted as the assistant coach in this research and

may have caused reactive effects in the athletes responses.

1.15 TERMINOLOGY

Following is a list of terms and definitions as they will be used

throughout the various studies in this research.

Avoidance: a behavior that increases in rate when it postpones or

avoids completely contact with an aversive stimulus.

Baseline: refers to a recording of the behavior of interest in the

absence of the experimental independent variable.

Behavioral Contract: the goals and procedures of a behavior change

program that are mutually agreed upon by the subject and others, and

modifiable by joint agreement. Also referred to in this research as a

contingency contract (Sulzer-Azaroff & Mayer, 1972, p.513).
Behavioral History: the subjects' total accumulation of all behavioral experiences.

Contingency: the relationship between a behavior and a response (Rushall & Siedentop, 1972, p.171).

Corrective Feedback: to information given to a subject that details the manner in which the behavior should be altered so that it may be correctly performed.

Discriminative Stimulus: a stimulus in the presence of which a response is likely to be reinforced. The presence of the SD sets the occasion for the response to occur because it cues the organism to the likelihood of reinforcement.

Dependent Variable: the behavior that is the focus of change.

Duration Recording: the amount of time during which an event occurs.

Edible Reinforcer: a class of primary reinforcers that acts as a stimulus contingent upon a behavior that increases or maintains the strength of the behavior.

External Validity: the degree to which a study's results are generalizable to other subjects, settings, or behaviors (Heward, 1987, p. 147).

First String: the starting position of a player on a team. This position is usually reserved for the teams' best players.

Free Throw / Foul Shot: refers to the behavior that occurs when a basketball player has taken a stance at the top of the opponents' key in a game situation, or the top of the practice key in the practice session, and attempts to throw the basketball through the basketball hoop without moving their feet closer to the basket.
Golden Support Behavior: the performance of the following behaviors by the athletes on the team during game situations; support teammates coming off of the floor, go to the huddle during time-outs and quarters, participate in the lady lancer yell, help the coach yell instructions to the players on the court, be a gracious winner/loser.

Huddle: a gathering of the team members during breaks in the basketball game, i.e., timeouts, ends of quarters, etc.

Hustling: the performance of these behaviors by the athletes on the team; listen to the coach; don't walk "between" drills; watch the action on the floor; do not sit on the gym floor or lean on the walls of the gym during practice; know the position you cover; and do not go for drinks without permission.

Independent Variable: is a particular arrangement of environmental events that the experimenter manipulates during a study. In applied behavior analysis this is often a behavioral procedure or treatment program.

Internal Validity: the degree to which the changes in the behavior are a function of the application of the independent variable and not extraneous or uncontrolled variables.

Intervention: the systematic introduction of the independent variable to the dependent variable of interest.

Modeling: a stimulus control procedure that uses demonstrations or modeling to prompt an imitative response (Sulzer-Azaroff & Mayer, 1977, p. 519). Off Task: athletes who engage in any or all of the following behaviors; does not listen to the coach; walks between drills; ignores
the action on the floor; sits on the gym floor or leans on the gym wall during practice; does not know the position they play; gets drinks without permission.

Off Task: athletes who engage in any or all of the following behaviors; listens to the coach; does not walk between drills; watches the action on the floor; does not sit on the gym floor or lean on the gym walls during practice; knows the position they play; does not get drinks without permission.

Practice Session: a gathering of all team members in which drills and strategies are taught and inter-team competition occurs. Practice schedule for this team was; Monday 5:15 - 7:00 p.m., Tuesday 5:15 - 7:00 p.m., Wednesday 3:15 - 5:15 p.m., Thursday 5:15 - 7:00 p.m., Friday 3:15 - 5:15 p.m., Saturday practice was intermittently scheduled, no Sunday practice.

Pre-Set Goal: the number of successful foul shots the athlete will try to accomplish prior to her actual attempts at foul shooting.

Pre-treatment: See Baseline

Physical Prompts: physically guiding the appropriate body parts through the desired or correct motion.

Public Posting: the visual display of performance outcomes.

Punisher: is a stimulus, when presented immediately following a response results in a reduction in the rate of the response.

Punishment: the contingent presentation of an aversive stimulus that results in a decrease in the future probability of the occurrence of the behavior. Type I punishment is punishment by contingent
stimulation. The coaches' verbal punishment that is delivered to the athlete following a poorly executed rebound would be an example of a Type I punishment condition. Type II punishment is punishment by contingent withdrawal. An example of a Type II punishment condition occurs when an athlete is removed from the starting line-up after they miss a practice session.

Reinforcer: a stimulus that increases the future probability of the response that immediately preceded its delivery.

Reinforcement: the contingent presentation of a non-aversive stimulus that results in an increase in the future probability of the occurrence of the behavior.

Response: a single instance of a behavior.

Second String: the athlete's relative position on a team. These athletes are not as skilled as the first string members of the team, but are more experienced than the third string members of the team.

Shaping: a procedure through which new behaviors are developed; the systematic reinforcement of successive approximations toward the behavioral objective (Sulzer-Azaroff & Mayer, 1977, p. 523).

Tangible Reinforcer: an object or activity event that serves as a stimulus that increases the future probability of the behavior it follows.

Third String: the least skilled level a player can occupy on a team, usually reserved for players who have a low level of skill development and/or are the newest members of the team.
Verbal Behavior: an operant behavior that is acquired through a person's interaction with other members of society.

Verbal Behavior - Negative Statements: punishers or aversive stimuli, that are delivered through verbal behavior.

Verbal Behavior - Positive Statements: reinforcers or non-aversive stimuli, that are delivered through verbal behavior.
CHAPTER II
REVIEW OF LITERATURE

2.1 INTRODUCTION

This chapter presents the major areas of research in sport behavior analysis. Following the publication of a group of founding articles, research in sport behavior analysis has developed into these areas; practice behaviors and its sub-area of personal fitness, skill development and its relationship to behavioral coaching, the development of behavioral coaching techniques, decreasing problem behaviors, and the cognitive behavior modification of skilled athletes. The motivation of practice behaviors includes such topics as getting team members to repetitively practice a fundamental drill, devising mechanisms that provide accurate feedback, and reinforcing exercise maintenance. Skill development involves the teaching of basic sport skills to those athletes who are just beginning their sport. A closely related area is behavioral coaching. This category of research concerns the application of behavior change techniques by the coach to improve player performance. Behavioral coaching involves the incorporation of behavioral procedures, i.e., public posting, contingency contracting, etc., into the practice of coaching. The area of decreasing problem behaviors in the sport environment includes such
topics as increasing help in equipment maintenance, encouraging team sportsmanship, and orderly conduct in both practice and game environments. The use of cognitive behavioral therapies in the sporting environment includes such techniques as imagery, stress management, and self-relaxation techniques. These studies concern the use of the visuomotor behavior rehearsal technique. This chapter provides a chronological review of the initial research that deals directly with sport behavior analysis. The development of each branch of research is presented and reviewed from its bases in the founding sport behavior analysis research articles.

2.2 INITIAL RESEARCH IN SPORT BEHAVIOR ANALYSIS

Published research reports in sport behavior analysis emanate from a core of fundamental studies. These studies are the building blocks upon which all other studies are built in sport behavior analysis. Every study and book chapter cited in the sub-areas of research in sport behavior analysis either directly references these research articles and books or cites a paper that directly references these articles.

The foundations of applied behavioral analysis in sport begin with Rushall's research on the personality factors of competitive athletes in two presentations at the Second International Congress of Sport Psychology, 1968. In his first report, on personality and physical fitness, Rushall summarizes the research across a wide variety of sports, i.e., basketball, baseball, swimming, and football, and
concludes that there is no relationship between physical fitness and personality. In his second report, Rushall suggest that in the absence of any trait/performance relationship, athletes should be viewed as individuals with personal histories of behavioral reinforcement and behavior tendencies. He goes on to suggest that the coach should utilize these individual histories to their fullest when programming behavioral change procedures for the athlete. For example, on a swimming team, one athlete may find candy a suitable reinforcer, while another prefers to earn free time for game playing during practice. In this study are beginnings of research in decreasing problem behaviors, the use of behavior modification in coaching, motivation for practice behaviors, and skill development.

In 1969 Rushall and Pettinger presented a study on the effects of different types of reinforcers on the work output of age group swimmers. Rushall and Pettinger discovered that the attention of the coach, a social reinforcer, resulted in a lower work output per swimmer that either candy, an unconditioned reinforcer, or money, a conditioned generalized reinforcer. Rushall and Pettinger demonstrated that the attention and encouragement of a coach, a social reinforcer, is weaker in promoting a behavioral change in the sport environment than either a unconditioned or conditioned generalized reinforcer. Athletes will perform more practice behaviors if they receive a tangible reinforcer for their effort. This study centers on the use of reinforcers to improve practice performance.
Rushall followed this article with another in 1970 that not only dispels some of the myths and assumptions commonly made in the study of sport behavior but also provides a thorough description and model of behavior control procedures and how they may be utilized in the sport of swimming. It is interesting to note that in this paper Rushall presents one of the first discussions of personality traits in sport. He concludes that the personality traits of a competitive swimmer were different with regard to sex categories and from those of normal (non-swimming) individuals yet there was no support for the assertion that performance classification can be determined by the personality characteristics of the athlete. This study provides insight on the application of behavioral techniques in coaching and refutes the use of trait theories in sport. It is important at this point to acknowledge the fact that visuomotor behavior rehearsal does not base its effectiveness on trait theory or interpersonal style theory.

The foundation of applied behavior analysis in sport was expanded with the publication of Rushall & Siedentop's book, "The development and control of behavior in sport and physical education" (1972). This book provided the first programmable application of behavioral techniques to problem areas experienced by most coaches. The book describes in great detail the application of such procedures as the use of shaping in skill development, contingency management, feedback, and reinforcement.

The need for a model of behavior control in sport was discussed in 1972 by Siedentop and Rushall, in "An operant model for skill
acquisition." In this article the authors discuss operant psychology as it is used to analyze skill acquisition in terms of the interaction between the performer and the environment. Also identified in this article are the two basic strategies of behavior control, shaping and maintenance. A sport skill must be learned, or shaped, and then maintained, or brought to the desired level of skill and magnitude. The area of skill acquisition and maintenance are a major concern of the coach. The article concludes that the use of operant psychology has been successful in other behavioral areas and would be a great help if used by a coach in shaping and maintaining a sport skill.

In a continuation of Rushall and Pettinger's 1969 study, McKenzie and Rushall, 1974, devised two experiments in which they increased work output during practice and decreased tardiness and absenteeism of swimmers. They used a public posting system in which attendance to practice was posted for every member of the team. This system resulted in a reduction in the number of athletes tardy or absent from practice. Public posting of work output also served to increase the number of work units completed by each swimmer. This study provides an expansion of the research in decreasing problem behaviors in an applied sport setting.

These studies serve as a foundation upon which applied behavior analysis in sport is solidly built. All serve as basic references in research articles and books throughout the five branches of research in sport behavior analysis. That they have served as basic research articles for applied behavior analysis in sport so well and for so long
is a demonstration of the sound methodology and wealth of ideas presented by their authors. Each of these studies provides a beginning upon which research in skill development, motivation for practice behaviors, decreasing problem behaviors, cognitive behavior modification, and the use of behavior modification in coaching have been be founded. As Rushall states, "Initially, it (behavior analysis) attempts to provide technologies which allow people to learn faster, adapt more quickly, and experience more than is possible in the traditional inefficient environments which are promoted as vehicles for behavior change...There is no reason for sport and physical education to neglect this trend" (Rushall, 1975, International Journal of Sport Psychology).

2.3 PRACTICE BEHAVIORS

In a study conducted by Kau & Fisher, 1974, a contingency contract, feedback, and reinforcements, as discussed by Siedentop and Rushall (1972), were used to increase the occurrence of exercise behavior for the subject. Through the use of behavioral contracting the subject was able to achieve her desired fitness goal. Daily reinforcers were delivered when the subject achieved her daily point goal. This study demonstrates the successful use of applied behavioral techniques to improve the level of fitness in a non-elite athlete.

A study that dealt with improving the performance of elite athletes was Bell and Patterson's 1978 study on the development of a self-monitoring techniques for the enhancement of swimming performance.
Citing the work of Rushall & Pettinger, 1969, and McKenzie & Rushall, 1974, Bell devised a method wherein members of a competitive university swim team were able to provide themselves with immediate reinforcement by marking the completion of each lap swum in the work-out drill on a water proof board in each lane in the pool. Bell found that this procedure of self-management did improve the orderliness of the practice sessions. Feedback from the athletes indicated that they found the procedure to be valuable in improving their times and performances.

Research in improving the performance of elite athletes continued with Heward's 1978 study, in which behavioral applications were applied to a professional sport group to improve game performance. Heward, like Rushall and Pettinger before him, used money as a reinforcer to improve individual players game performance. The three players with the highest EA's, efficiency averages, were given five, three, and two dollars respectively. While a functional relationship between the intervention and the subject's baseball behavior was not demonstrated, this study was one of the first to apply behavioral procedures with professional level athletes.

In a study of an elite, varsity level, women's volleyball team, McKenzie & Liskeveych (1983) demonstrated the effectiveness of the coach in producing maximum efficiency of responding. The level of passing accuracy increased over time, however, the use of a multi-element design demonstrated the opportunity to receive additional individual practice time was more effective in improving passing
accuracy than either money or no-reinforcement conditions. Unlike the Rushall and Pettinger, 1969, study in which access to the coaches positive social reinforcement was not effective in producing improved performance, while access to tangible reinforcers were effective on producing an increase in work out-put, in this study access to the coach meant that the athlete received individualized instruction and direct feedback which could be considered as a tangible commodity. It would seem than that the reinforcement value of a coach is based on the amount of direct instruction on skill development, rather than social reinforcement, given to the athletes.

A sub-area of practice behavior is research that deals with personal fitness. Typically, this research is concerns a non-athletic population that needs a program of personal fitness to obtain or maintain a personal fitness level. Many behavioral programs have been developed to assist this population.

In an effort to improve personal fitness, Wysocki, Hall, Iwata & Riordin (1979), used contingency contracting to improve the aerobic fitness level of seven of eight college students. Subjects earned back personal items through the fulfillment of the contract. The results indicate that contingency contracting was successful in increasing the level of aerobic fitness as measured by points earned through exercise activities (Cooper, 1970). A one year follow-up questionnaire indicated that seven of eight subjects were engaging in more activity than they were prior to the contingency contract intervention. The study supports the use of a contingency contract to increase and maintain exercise behaviors.
The maintenance of exercise behaviors for non-elite athletes having been demonstrated (Wysocki, et al. 1979), Allen & Iwata (1980) extended the use of behavior maintenance techniques when they used the Premack principle (Premack, 1959) to increase the level of participation in exercise behaviors for 10 retarded individuals. In this study, a multi-element design showed that subjects were more interested in participating in a game activity than in an exercise activity. Participation in the game activity was then made contingent upon completion of the criterion level of exercise activities. This intervention lead to an increase in both the participation and completion of exercise activities and a reduction in the amount of time spent in the exercise session.

In a comparison of the techniques behavioral contracting and random lottery, in improving fitness levels and attendance, Epstein, Wing, Thompson, & Griffin, 1980, demonstrated that the behavioral contracting is more effective in promoting fitness, measured in miles jogged, than either a lottery or control groups. Increases in physical fitness as measured by a pre/post 12 minute fitness test showed a significant improvement in fitness for groups in the contract condition. This study extended the application of behavioral contracting as a procedure to improve attendance and fitness.

In 1980, Keefe & Blumenthal, assessed the possibilities of using self-reinforcement and stimulus control as a package of procedures designed to develop a life time fitness program. Subjects in this study had a history of low maintenance of a physical fitness program.
The stimulus control procedures involved asking subjects to exercise at the same time every day, engage in ten minutes of warm up, set an exercise goal of not more than ten percent of their total distance for the previous week. Self-reinforcement involved the delivery of pre-selected personal reinforcers upon the completion of the self-set exercise criterion. The results of this study indicate that simple behavioral techniques can be used to effectively maintain an exercise schedule for a two-year period.

In an effort to increase the exercise behavior of college women independent of any formal program, King & Frederiksen (1984) studied the effects of social support groups and relapse preparation, that is preparing the individual to come back to the exercise program after missing one planned exercise period. The results indicate that jogging in a social group or relapse training greatly increases the individuals continued participation in a regular exercise program. This study demonstrated the use low cost methods as effective procedure for increasing individual participation in regular exercise.

The repetitive nature of the drills of basic skills necessary to improve performance is a problem for all beginning athletes. Hume, Martin, Gonzalez, Cracklen, and Genthon, 1985, developed a self-management package that would allow a beginning level skater to self-monitor their progress during practice. The progress was then noted and reinforced by the coach. A bar graph was provided to each skater that compared baseline with improved levels of performance. The self-management package was effective in improving the skaters skill
performance. This study extends to the sport of skating procedures demonstrated effective in other sports such as high school basketball and football practices (Siedentop, 1978), age group swimming practices, (McKenzie & Rushall, 1974) and professional baseball players (Heward, 1978).

2.4 SUMMARY.

A variety of behavioral techniques have been shown to be effective across many sports and with athletes of many different skill levels. All techniques have been shown to improve practice behavior, in either quantity or quality, or both. Different behavioral techniques are applied to different problems depending on the skill level of the athletes. For example, professional athletes may experience problems of skill execution during competition, while beginning athletes may have difficulty maintaining a regular level of exercise. Both situations can be improved through the use of behavioral techniques, though the techniques and their application may vary from situation to situation.

2.5 SKILL DEVELOPMENT

The area of skill development concerns the teaching of sports skills to beginning athletes and the reduction in errors of those learning these new skills. Applied behavior analysis in sports borrows most heavily in this area from research conducted in the area of physical education. Techniques applied in this area include shaping, modeling,
self-monitoring, and posted feedback for correct performance. Many target sports skills have been effectively taught, these include defensive plays in football, gymnastics skills, tennis skills, and bowling.

One of the earliest studies in the effectiveness of feedback on sport skill development was conducted by Fueyo, Saudargas, & Bushell, (1975). In this study two types of feedback were compared for their effectiveness in teaching swimming skills to handicapped children. Following the research of Rushall and Pettinger, 1969, two types of feedback, task-specific-praise plus corrections and non-task-specific praise were compared as to their effectiveness in teaching handicapped children swimming skills. The children were grouped into pairs and each child experienced both conditions across different skills. Child A would work on one swimming skill under the task-specific-praise plus corrections feedback and another skill under the non-task-specific praise feedback. The skill sessions would be alternated with another child's skill sessions but the instructor remained constant across feedback conditions. The results demonstrated the effectiveness of the task-specific-praise plus corrections over the non-task-specific praise condition. All children were quicker to learn a swimming skill in the task-specific-praise plus corrections feedback condition. This study provides support for the use of specific praise and correction statements by coaches when teaching sport skills to beginning level athletes.
Research into the area of skill development, following the publication of the initial articles in sport behavior analysis, continued with Komaki and Barnett's 1977 study on improving the blocking and backfield play execution of players on a Pop Warner football team. Komaki and Barnett broke down three plays into a series of five stages. Each stage was described in behavioral terms. The coach would then teach the plays to the players in the five stages and practice the three plays during scrimmages. By checking off each stage of play execution as it occurred, the coach could assess the percentage of accuracy in play execution and provide feedback to the players on their performance. During the scrimmage sessions feedback and recognition were given immediately, during games feedback was given at the next practice session. Although the backfield rarely executed plays perfectly, the use of specific feedback and positive reinforcement did improve the percentage of play execution over the baseline level. This study supports the use of specific and immediate feedback when developing the skills of young athletes.

In two studies that improved both skill execution and practice behavior of football and basketball players, Siedentop, 1978, demonstrates the use of a contingency contract in the practice environments. In the football study players earned points for achieving preset goals. These goals included practice attendance, a score of 90% or better on play quizzes, and a minimum of one penalty per scrimmage. Achievement of these and seven other goals meant that the player would be a 100%'er for the week. This meant that the player
would get a helmet decal and be a starter for that week's game. In the basketball study, athletes were awarded for daily points for performing successful lay-up drills, jump shooting drills, and free throw drills. Points were also awarded for being a "team player". The coach explained that he would deduct points for instances of lack of hustle or a bad attitude. The coach then provided the players with specific instances of this type of behavior. Players who earned a specific amount of points were given an "Eagle Effort" award at the post-season banquet. Improvement in practice behaviors and skill execution was demonstrated in both studies. These studies support the use of a contingency management program to improve skill execution and management of practice behaviors.

As part of an ongoing study in the use of behavioral interventions in golf, Simeck and O'Brian (1978) used an auditory feedback system to improve head steadiness while putting. The golfer would hear the loud click when he moved his head from the correct position, the feedback on the error was immediate. Results indicate that this immediate and aversive feedback did increase steadiness and result in significantly better putting. This study provides support for the use of immediate feedback when developing a skill or trying to correct performance of a skill.

It is easy to see where one study lends itself to the expansion of research in two different areas, such as skill development and behavioral coaching. The next study assess the use of behavioral coaching techniques as they affect skill development. Allison and Ayllon were the first to use the term behavioral coaching in their 1980
study on the application of behavioral techniques to football, gymnastic, and tennis skill execution. In the football study the blocking skills of three players were improved through the use of behavioral coaching package. In the gymnastics study, behavioral coaching was compared to traditional method of coaching. The findings in this study indicate that the behavioral coaching method was more effective in generating and correcting target skills than the traditional method. Improvement in tennis skill execution was demonstrated using a multiple baseline across behaviors and across individuals. Behavioral coaching was intermittently replaced with the traditional coaching method. Results indicate that the behavioral coaching method was more effective in producing skill acquisition and maintenance than the traditional coaching method.

An extension of the Allison and Ayllon study was conducted by Buzas and Ayllon in 1981. This study compared the effects of a coach correcting errors by selectively ignoring errors with a coach attending only to correct skill execution in a typical tennis class. This study assessed the application of differential reinforcement to the acquisition of tennis forehand, backhand, and serves. The behavioral procedure of differential reinforcement increased execution of the three tennis skills for all three players.

Koop and Martin (1983) analyzed the application of behavioral coaching to reduce swimming stroke errors with beginning age-group swimmers. Errors in stroke execution was assessed for three members of the team. Correction of these errors was assessed using a multiple
baseline across subjects and consisted of the application of behavioral coaching package that identified the correctly performed behavior components of the skill, out-of-pool intervention on the incorrect component, in-pool practice of correct components, in-pool consequences of incorrect performance, and in-pool consequences of correct performances. Baseline data were collected under the standard coaching condition, intervention data were collected under the behavioral coaching package condition. Results indicated that the behavioral coaching package was effective in reducing the errors in swimming stroke performance. This study extended the effectiveness of skill development through the use of behavioral coaching techniques.

Another study that examined the effects of a behavioral coaching techniques to improve the performance of sport skills is Fitterling and Ayllon's, 1983, research on the execution of ballet barre exercises. Behavioral coaching of ballet was compared to the instructors regular method of teaching by using a combination of multiple baseline across subjects and multiple baseline across behaviors design. To minimize the effects due to increasing difficulty of each exercise, the sequence of the four exercises was random across the three subjects. Using immediate performance feedback and correction, and a "freeze" technique as components of the behavioral coaching package, results indicate an increase in the level of skill execution for those exercises taught using behavioral coaching. This research extends the demonstrated effectiveness of behavioral coaching to an area not often considered to be sport, that of ballet.
In an extension of the behavioral coaching methods demonstrated to be effective for Allison and Ayllon (1980) Shaperio and Sheperio, 1985, increased the number of conditioning components successfully completed and increased the correct execution of forms and starts for all runners who were members of a high school track team.

2.6 SUMMARY

In searching for a better way to develop sport skills many techniques have been tried. These techniques range from an auditory feedback system for incorrect head position during a golf swing to a earned point system for increasing the number of successful foul shots during practice. Behavioral coaching is a natural outgrowth of the application of behavioral procedures to increase skill development. Coaches are those individuals assigned to the task of improving the level of sport skill execution in athletes. Coaches are naturally interested in any technique that improves athletic skill development. A combination of the techniques used to improve skills in athletes, a behavioral coaching package, have been successful in a wide variety of sport, literally from football to ballet.

2.7 BEHAVIORAL COACHING

This section concerns the development of a method of coaching sport using applied behavior change techniques. These techniques have been applied to many areas, as in sport skill development discussed above, and across many different sports and age groups. This section will examine the development of behavioral coaching.
Between the foundations of behavioral coaching that can be traced back to Rushall and Siedentop, 1972, and the identification and naming of this area by Allison and Ayllon in 1980 there exists a network of studies that demonstrate the effectiveness of behavioral coaching. The first of these articles is by Ziegler and Callahan, 1977, in which the authors discuss the basic procedures and characteristics of applied behavior analysis. Ziegler and Callahan present a two fold rational for the use of applied behavior analysis in sport, 1) it can lead to the development of observation, intervention, and evaluation tools for the systematic study of behavior in sport, and 2) it can define the reciprocal nature of coaching. The coach must be an accurate observer of the athletes behavior, its antecedents, and its consequences. The article by Ziegler and Callahan presents a concise argument for the use of applied behavior analysis in sport.

In an extension of the argument in support of the use of applied behavior analysis in sport, Rushall, 1977, identifies the basic postulates and limitations of applied behavior analysis. Rushall points to the deficiencies of the other schools of thought such as the lack of an explanation of a bridging mechanism in the mind-body theory, the dualistic notion of a world of phenomena and a world of physical events that can not be equated in the phenomenological position, the inability to study feeling as a natural science is cited as a detriment to the psychic-manifestation theory, and the irreconcilable idea that the body contains a soul or a inner man (Skinner, 1971) as proposed by the organocentric postulate. This article clearly labels applied
behavior analysis as a scientifically based area of psychology. It
does not contemplate embracing hypothetical entities or non-measurable
behaviors. Rushall identifies the identification of functional
relationships between behaviors and the environment as the primary
contribution of applied behavior analysis to practitioners.

Following this period of establishing the applied behavior analysis
as a science, there were many attempts to devise a measuring system
through which behaviors could be easily identified and measured.
Rushall, 1977, constructed two observation schedules, one for the coach
and one for the athlete, for use in sporting and physical education
environments. The Teacher/Coach observation schedule identified and
categorized seven behaviors emitted on the part of the coach. These
categories were; 1) feedback and rewarding, 2) correcting and
prohibiting, 3) questioning, 4) directing, explaining, and informing,
5) monitoring and attending, 6) managing, and 7) no activity. Rushall
provides examples in the use of this observation schedule and suggests
appropriate analytical procedures for each example.

In 1979, Rushall and Smith, used the Coach Observation Schedule as a
measure of a coach's behavior in several categories. The coach had
solicited help in becoming a better coach. There were many behaviors
to increase in frequency and some to decrease in frequency. The use of
the COS allowed the authors to determine the frequency of the behaviors
being emitted and their degree of emphasis. Rushall and Smith
successfully used self-recording and prompting of feedback behavior and
self-recording and prompting of reward followed by feedback behaviors.
Both of these conditions resulted in an increase in the number of desirable behaviors in each category.

In 1978, Smith, Smoll, and Hunt, published an article that described the use of a Coaching Behavioral Assessment System. This system would provide the used with a measure of the coaches behaviors in a naturalistic setting. The authors divided the categories into only two, reactive behaviors and spontaneous behaviors. Reactive behaviors included such behaviors as positive reinforcement or reward, non-reinforcement, mistake contingent encouragement, mistake contingent technical instruction, punishment, ignoring mistakes, and keeping control. Spontaneous behaviors included general technical instruction, general encouragement, organization, and general communication.

In 1979, Smith, Smoll, and Curtis use the Coaching Behavioral Assessment System to assess the difference between behavioral trained little league coaches and non-trained coaches. The authors found that providing coaches with basic training in the use of positive reinforcement, directly instruction, and immediate feedback improved the players perception of the coaches. It was found that children with low-self esteem were the most sensitive to the coaches use of encouragement, punishment, and technical instruction. This study demonstrates the importance of coaches behaviors in developing a reinforcing association with sport.

Behavioral coaching and its components were identified and named for the first time by Allison and Ayllon in 1980. They described behavioral coaching as a method that involves several behavioral
techniques that focus on the correction of errors. This coaching method is made of the following components, 1) systematic use of verbal instructions and feedback, 2) positive and negative reinforcement, 3) positive practice, and 4) time out.

The component of verbal instructions and feedback was explored by McKenzie and King in 1982. Their research concerned the effects of untrained coaches in youth leagues baseball teams. The authors found that many coaches provided feedback to the player at high rates but of an unspecific nature. Most coaches interacted positively and showed concern for the players development of sport skills. The players of coaches who provided high rates of reinforcement not only rated the sport and teammates more highly than the players of coaches who provided reinforcement at low rates but also had higher levels of self-esteem. The authors conclude that in order to provide optimum level of skill development volunteer coaches should be trained in giving specific feedback.

All of the studies examined thus far have placed an adult in the role of the coach. Rush and Ayllon, 1984, switched this arrangement and examined the possibility of a peer-tutoring system in coaching. The effects of a conventional form of coaching were compared to behavioral coaching when the coach was a peer. Results indicate a two to three fold increase in soccer skill performance when a peer using the behavioral coaching technique was employed as the head coach. This study provides an extension of the demonstration of the effectiveness of behavioral coaching. Behavioral coaching is effective not only
across different sports, ages of athletes, and skill levels, but also head coaches.

In an effort to identify the continually emerging elements of effective behavioral coaching, Martin and Hrycaiko, 1983, published an article that outlines six areas of emphasis in effective behavioral coaching. These areas are; 1) measurement of athletic performance, 2) distinction between developing and maintaining behavior, 3) encouragement to improve against performance, 4) emphasis on coaching as a science, 5) behavior modification for the coach, and 6) social validation. These elements identify the characteristics of behavioral coaching rather than list or demonstrate the application of the behavioral coaching procedures identified by Allison and Ayllon (1980). These six elements provide a description of effective behavioral coaching and its identifying characteristics rather than a prescription for application.

Recognizing the need for descriptions of the application of applied behavior coaching techniques, Martin and Lumsden, 1987, published a book that provides athletes and coaches with a systematic behavioral approach to coaching and playing an entire season of sport. Drawing on many different sports, Martin and Lumsden identify the characteristics of behavioral coaching, planning and managing practice behaviors, and the ethical considerations of coaching. In this book it seems that behavioral coaching has come full circle, from Rushall and Siedentop (1972) to Martin and Lumsden (1987) both books provide a coach or athlete with a systematic and applied approach to the use of effective behavioral coaching.
2.8 SUMMARY

This section has examined the development of behavioral coaching in sport behavior analysis. Identified in this section were the development of two behavioral measurement instruments. Often it seemed as though both were measuring the same behaviors the only difference lying in the labels used by each system. However, the youth of this field precludes final evaluation of the usefulness of one system over the other. The development of both the applied identification of behavioral procedures in sport and the development of characteristics of effective behavioral coaching were chronicled. An interesting extension of applied behavioral coaching was discussed when a peer using behavioral coaching techniques proved more effective in increasing sport skill than the adult head coach using traditional method. This is an area with great potential for development in sport behavior analysis.

2.9 DECREASING PROBLEM BEHAVIORS

This section of sport behavior analysis concerns the application of behavioral procedures to the management of the practice or performance environment. Such "housekeeping" duties are not often seen as important in the performance of a sport skill but it takes little to imagine the chaos that would result if the sport environment were devoid of any regulation. Very few, if any, athletes or coaches would find such a situation conducive to the learning, practice, or performance of a sport skill. Far too much attention has been paid to
the athlete and to little to the environment in which the athlete must perform, a shift in research focus is suggested.

The duties of "housekeeping" in a sport environment are redundant and difficult to maintain. Pierce and Risley, 1974, were faced with the problem of improving job performance of Neighborhood Youth Corp workers in a urban recreation program. The job of these workers was to maintain the condition of the physical facilities of the game room at a local drop in house. Using the job description to develop a daily checklist of duties workers were able to increase the level of pay they received based on the number of items checked off the list. When pay was made contingent upon the performance of specific task, the percentage of completed tasks rose. With a change in the criterion necessary for pay, all seven workers completed 100% of their work. Pierce and Risley demonstrated the need for specific identification of the duties to be accomplished and directly pairing the number of tasks completed with the amount of pay received.

Rushall in 1983 discusses the effects of the application of positive reinforcement for rule following or performance behaviors. Following Pierce and Risley's procedure of pairing a task with reinforcement, Rushall encourages the application of a reinforcer anytime the coach sees good behavior to increase the behaviors frequency. Rushall refers to this as a teachable moment. By pairing performance information with reinforcers, Rushall demonstrates an increase in the number of responses and level of motivation on the part of the athletes. In this study Rushall applies the procedures demonstrated to be effective in
the Pierce and Risley study to the sport environment. The result is an increase in the level of motivation demonstrated by the athletes. Also provided are lists of procedures to be followed that allow a coach to apply the same techniques to any other sport.

The use of positive reinforcement when paired with certain behaviors to increase the future probability of the occurrence of those behaviors has been demonstrated. Our attention will now focus on the use of verbal praise and reprimand as compared to the effectiveness of a behavior game in the reduction of inappropriate behaviors. In a study conducted by McKenzie and Rushall, 1980, the effects of verbal praise, verbal punishment and a behavioral game were compared in their ability to reduce the occurrence of inappropriate swimming behaviors. The first method of control was the delivery of praise and reprimand statements on the part of the coach contingent upon the occurrence of the specific behaviors. A self-recording technique increased the frequency of praise statements made by the coach. The second method consisted of a "Disqualification" game in which members of the team could disqualify each other based upon their observance of their peers engaging in inappropriate swimming behaviors. The results indicate that the game based method was the most effective in reducing the occurrence of inappropriate behaviors.

The attention paid to the verbal behavior of those surrounding the athlete was extended in a study conducted by Walley, Graham, and Forehand, 1982, in which the verbal behavior of adult observers of T-ball baseball games was assessed. The results of their assessment
indicated that observers were more likely to verbally praise or emit verbally neutral statements than to provide verbal punishment to the games participants. The authors also found that the distribution of leaflets was not effective in changing the verbal behavior of the adult observers of the game, although the observers reported that they had read the leaflet and had increased their positive verbal statements. This study indicates the need for empirically based research concerning the effect of verbal behavior on the performance of sport skills. It is unclear why the authors chose a non-behavioral intervention for a behaviorally based event, however, they do recognize the need for direct feedback and modeling as possible methods in correcting verbal behavior.

2.10 SUMMARY

This section has dealt with problem behaviors as they occur in the sport environment. These problems range from maintaining the "housekeeping" duties of equipment upkeep to analyzing the effects of negative verbal behavior in the correction of inappropriate sports skills. Although a diverse area of concern, the importance of the control of problem behavior in the sport environment is reflected by the number of studies conducted to identify methods of providing control of inappropriate behaviors.
2.11 COGNITIVE BEHAVIORAL MODIFICATION

The use of cognitive behavior modification concerns the application of relaxation, systematic desensitization, and imagery rehearsal therapies with athletes who have developed a high level of skill. Typically, athletes who are highly skilled engage in competition at the top level of their sport. The athlete can perform the sport skill at a world class level. Performance of the sport skill under these conditions may be enhanced through the use of cognitive behavior modification. The majority of athletes do not come under this category of skill level. The non-elite athlete would be better served by the use of skill development techniques to acquire the skill and then correct skill execution. Following the acquisition of the skill, the non-elite athlete may enter competitive conditions in which the use of cognitive behavior modification would be appropriate.

In 1972, Suinn reported the successful use of the behavior modification therapies, relaxation and imagination to improve the level of skill execution of downhill skiers. Originally, six skiers were matched against a control group and the racing results of each were to be compared, however, the treatment subjects performed so well that they were used in all competitive events. No comparative data was provided. This study demonstrated the need for physiological relaxation in athletes pre-competition states.

Suinn continued his research in this area and in 1972 developed Anxiety Management Training, AMT. AMT is a conditioning process whereby the stimuli of the anxiety experience is connected through
training with anxiety reduction. Suinn (1976) described the successful use of this procedure in reducing the level of anxiety experienced by a client in social situations. Follow up data was not provided.

Suinn (1972) successfully reduced the level of anxiety for a Ph.D. candidate with severe examination anxiety developing a visuomotor behavior rehearsal technique. VMBR allowed the client to perform under a stressful condition and avoid the mental blocking that had occurred earlier. Through a rehearsal technique, in which the examination conditions were mimicked, the candidate was able to answer questions in a competent manner.

In an extension of the imagery research, Mahoney and Avner (1977), found that there was a correlation between sport performance and the occurrence of verbal and visual sport imagery on the part of the athlete. Specifically, dream frequency, self-verbalizations, and certain forms of mental imagery seemed to differentiate the best gymnasts from those who failed to make the Olympic team. This finding was the result of a survey conducted to assess the psychological factors and cognitive strategies of highly skilled athletic competitors. The survey was conducted with a small group, N=12.

The element of visualization seems to be influential in preparing athletes for performance. Shelton and Mahoney, 1978, examined the type of preparing strategies that athletes used. A comparison was made on the personal psyching strategies of competitive weight lifters. Shelton and Mahoney identified four strategies, 1) self-efficacy, 2) control of attention, 3) preparatory arousal, and 4) imagery
techniques. The control of attention was the most often used technique in preparing for competitive weight lifting.

In an effort to provide an analysis of the factors contributing to successful sport performance Suinn, (1980), describes a outline of the factors that affect sport performance. Suinn identifies the skill acquisition factor and the ability of coach and athlete to strengthen correct responses, transfer the skill to a competitive environment, and place on extinction incorrect responses. These are all areas in which applied behavior analysis has a long history of success. In this article Suinn, also provides physiological data supporting the effect of relaxation on the body's heart rate and oxygen consumption.

Lane, (1980), studied the use of the VMBR technique with a number of sport skills, specifically identified were basketball foul shooting and baseball pitching. Lane provides some clarification of the perspective necessary for imagery to be most effective. He states that the athlete should view the behavior as if s/he were actually performing it, not as a spectator would see the performance. He also identifies the most beneficial aspect for athlete with well developed skill level in using the VMBR, that is an increased ability to concentrate and focus on the task at hand. Lane's study supports the use of VMBR over the use of relaxation only for improving the performance of highly skilled athletes.

Noel, (1980), extended the use of the VMBR techniques to the performance of a tennis service during tournament competition. He found that the higher ability group performed better than the lower
ability group. In fact the lower ability group decreased in their number of successful first serves. He concluded that VMBR was not necessary for higher skilled athletes, and that lower skilled athletes needed more practice. In this study Noel failed to realize the purpose of VMBR, that is to reduce the athletes tension in an anxiety arousing situation. None of the subjects in this study was assessed as to the level of anxiety they experienced while performing a tennis serve in competition. It is difficult to imagine the effects of an anxiety reduction technique on the performance skill of an athlete whose anxiety level was never identified. This seems to be a case of a child who, with his first hammer, identifies every object in his environment as a nail.

The effects of a relaxation (Jacobson, 1938) and coping strategy (Meichenbaum, 1977) were evaluated with respect to a highly skilled basketball players performance scores over seven matched games (Meyers and Schleser, 1980). The games were matched on the basis of the number of minutes played by the athlete. The application of cognitive coping strategy coincided with significant increases in the athletes points scored per game, shooting percentage, and percentage of total team scoring. However, both internal and external confounding variables were not controlled. Additionally, other than an unstructured interview, no measures were obtained to insure that the athlete had adopted the cognitive-coping strategy. Again the demonstration of the effectiveness of the cognitive behavioral technique is undermined by poor experimental design and analysis skills.
In a extension of the study conducted by Mechner and Avener, (1977), Gravel, Leimieux, and Ladoucer, 1980, used a behavioral treatment package to increase the focus of skiers on their task at hand and their own body stimuli. This study focused on teaching cross-country skiers to alter their mental imagery from one of thoughts of disaster to thoughts of skill performance and internal body sensations. These authors report a reduction in the ruminative cognitive patterns. This study supports the hypothesis that it is desirable to detect the patterns of anxiety and to alter the athletes focus to more appropriate stimuli in the environment.

The identification of environmental stimuli, and the inclusion of the athletes body sensations as a part of the environment, is discussed by Silva, 1982, as a part of a cognitive restructuring technique. In all three examples of skilled athletes problem behaviors presented by Silva, it is the identification of the environmental antecedents and the athletes response to these cues, recorded through the use of an athletes daily log book, that set the course for the cognitive restructuring therapy. The techniques described in the cognitive restructuring techniques seem to combine the identification of environmental stimuli, cue words or phrases, with the practice of the sport skill. This paring of an cue word with the desired behavior could be viewed as providing the athlete with a discriminative stimulus to cue the behavioral response of a foul shot, keeping your stick down, or cue-controlled relaxation.
2.12 SUMMARY

The areas of concern in cognitive behavioral therapies are mental imagery, relaxation, and systematic desensitization. Many of the research articles that support the use of these techniques have obvious flaws, however, there is a small but persistent demonstration of the usefulness of these techniques in improving the performance of highly skilled athletes. No research area that improves an individual's ability to achieve their goal performance should be dismissed for lack of good methodological techniques on the part of the investigator. What this area of sport behavior analysis greatly needs is the development of a thorough and systematic replication of the procedures, skill levels, and subjects with whom these techniques are applied.

2.13 SUMMARY OF LITERATURE REVIEW

This review has identified the fundamental articles of initial research in sport behavior analysis. This tree of fundamental studies develops into very diverse branches of research. These areas include the improvement of practice behaviors and its sub-area of personal fitness. Many of the procedures used to improve practice performance, the use of tangible and social reinforcers, are also applicable to the behavior of improving personal fitness. Skill development, a primary concern for coaches, is improved through the use of positive and informative feedback. Effective behavioral coaching was described and its characteristics were identified. The area of research concerning the reduction of problem behaviors in the sport environment was
discussed. Using a direct paring of work behaviors with pay, the occurrence of work related behaviors increased. The tentative area of cognitive behavioral therapies was also reviewed. This area was identified as the most in need of solid research methodologies and replication to identify the true effects of the cognitive interventions of sport skill performance. The results of current research in this area are inconclusive at best.
CHAPTER III

METHOD

This chapter describes the subjects, settings, and procedures used in this study. This section defines both the dependent and independent variables for each of the problem areas identified. Additionally, the methods of data collection and the type of designs used in each of the problem areas are described.

3.1 SUBJECTS

The subjects in this study were 11 white and 4 black female athletes that made up a girls junior high school basketball team. The athletes ranged in age from 12 to 14 years. These athletes were all students at the same public junior high school. The members often saw each other throughout the day in classes and other school activities. All of the athletes were from middle income families with median socioeconomic status. Four of the athletes were from divorced families and one lived with her grandparents for undetermined reasons.
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<th>Skill Level</th>
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<td>8</td>
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The Coach had previously coached 4 years of junior high school basketball. Other than coaching, her past experience with basketball was as a player on her high school team. The coach required each player to sign a copy of the team's rules and regulations (Appendix I). She coached in the same junior high school in which she taught home economics. She had been teaching as a home economics teacher in this school for 8 years. She was attending a local university on weekends to increase her certification level.

3.2 SETTING

This study was conducted during the 1987-1988 basketball season. This time frame covers the months of November and December 1987, and January 1988. The study began at the first day of tryouts and continued through the last week of the regular season. Interventions in this study were in effect during both the team practice and game environments. All dependent variables were recorded in either a game environment, both home and away, or during practice. All practice sessions were held in the home school's gym (Appendix A). Each of the 15 players on the team were involved in one or more intervention, with many subjects experiencing simultaneous interventions in different environments and for different behaviors. Parental consent was obtained for each subject's participation in this study prior to the start of the season (Appendix B). The study was reviewed and approved by the school principal, athletic director, and coach (Appendix C).
3.3 EXPERIMENTER

The experimenter was a fourth-year doctoral candidate majoring in sport psychology with an emphasis in applied behavior analysis. The experimenter had previously played basketball in junior high school and high school. The experimenter served as an assistant coach in this study and should be considered as part of the team and the sport environment.

3.4 OBSERVERS

Everyone who tried out for the team was not selected. Those not chosen were given the option of being managers for the team for the season. Eight girls who tried out, but were not selected for the team, chose to become managers. All managers were told by the coach that they would occasionally be asked to do things for the investigator and they were to comply with these requests. During the first week of practice all eight observers/managers were trained to use event recording and momentary time sampling when observing the behavior of the athletes and the coach. At the beginning of each practice session one manager was told to observe a randomly selected player during the foul shooting portion of the practice session and to report the number of foul shots the player made. This report was then compared with the self report given by the player. Another manager was told that on a signal she was to look at the court and count the number of athletes who were leaning against the wall of the gym, walking, or talking to other players. Another manager was told that on a signal she was to
count the number of positive statements the players were making to each other and another manager was told to count the number of positive statements the coach was making to the players until they were both signaled to stop recording. The same procedure was used to count the number of negative statements, player to player or coach to player. Behaviors, such as attendance, tardiness, and appropriate dress were written in the coach's attendance book.

All manager/observers were instructed on the behavioral definition of a successful shot during foul shooting, being "off-task" as defined by the coach's rules, and the positive/negative verbal statements that occurred between teammates, and from the coach to team members.

The observer/managers were trained to 90% inter-observer agreement level before their data were considered as evidence relative to the dependent variable. The 90% criterion level was reached between the investigator and the manager and between the manager and another manager who recorded the same behavior. All training occurred in the practice setting, that is, the home gym.

Observer/managers were trained to use both event recording and momentary time sampling. Event recording was used throughout the foul shooting drill during each practice session. Event recording percent agreement was calculated by dividing the smaller total by the larger total and multiplying by a hundred. Momentary time sampling was used to record the number of athletes "off-task" at the end of a randomly chosen five minute period. With momentary time sampling the total number of athletes "off-task" was divided by the total number of
athletes present to get a percentage of the number of athletes "off-task" for that sample in the practice session. The observer/managers used event recording for intervals of 5 minutes to measure the number of positive/negative comments made between players or by the coach to the players.

All of the observer/managers were not used in every phase of every experiment. There was some attrition through the course of the season. Three of the eight original managers who were trained to criterion discontinued their association with the team.

3.5 DEFINITION OF THE DEPENDENT VARIABLES

The dependent variables in this study were chosen because of their relevance to the team and the coach. Unlike other studies, in which both the dependent and independent variable(s) are selected prior to beginning of the study, this study allowed the coach and athletes to select the dependent variable(s) they saw as most in need of change. This study also allowed the coach to alter the emphasis placed on the change of a dependent variable in the study if she felt the behavior was no longer a problem for the team. The coach could, and did, cancel a behavior change program designed for a behavior that she identified in the pre-season as a problem. The coach decided the problem, being on time to practice, no longer existed after the season had started. This approach provided a good assessment of those behaviors that a coach would identify as problem areas throughout the course of a season, rather than an example of the behaviors a researcher assumes are problem areas in the applied sport environment.
3.6 CONTRACTING FOR ATTENDANCE

The dependent variable in this study was to improve practice attendance to 100% for Player #15. She was required to be in the locker room at the scheduled start of practice which, depending on the practice day, was either 3:15 p.m. or 5:15 p.m., remember to bring the appropriate gym clothing (i.e. gym shoes, shorts, etc.) and be appropriately dressed at the scheduled start of practice.

3.7 APPROPRIATE GAME DRESS

The dependent variables in this study were the presence of each athlete in appropriate game dress before the start of a game. Appropriate game dress is defined for each athlete as remembering her court shoes, socks, home or away jersey, and home or away shorts.

3.8 SHAPING FOUL SHOOTING

The dependent variable in this study was the achievement of 85 percent accuracy for three consecutive sessions of 20 attempted foul shots from the foul line for Players 11, 12, and 13, who were identified by the coach as in need of improvement in foul shooting ability.

3.9 PERFORMANCE CONSISTENCY

The dependent variable in this study was the comparison of improvement in the percent accuracy of foul shooting for each member of the team during practice under two different conditions.
3.10 CHANGING THE VERBAL BEHAVIOR OF A COACH

The dependent variables in this study were the number of positive/negative statements made by the coach to the players or by the players to other teammates. The positive statements were defined as complimenting teammates on their performance, encouraging teammates to do better, and supported their efforts when they did not make their shots. The negative statements were defined as swearing at teammates, insulting teammates, and pointing out teammates deficiencies without providing any corrective feedback.

3.11 GOLDEN SUPPORT GAME

The dependent variable in this study was the number of times players on the bench gave verbal support during a game to their teammates on the court. This verbal support was defined as supporting teammates who come off the court, going to the huddle during time outs and quarters, participating in the Lady Lancer yell, helping the coach yell instructions to the players on the court, and being a gracious winner/loser. "Gracious" being defined as shaking hands with members of the opposing game regardless of the outcome of the game.

3.12 ON TIME TO PRACTICE

The dependent variable in this study was the number of players on time to practice. Being "on time" was defined as being dressed and in the girls locker room at the time that practice was scheduled to start.
3.13 INCREASING "HUSTLE" DURING PRACTICE

The dependent variable in this study was the number of athletes who were "off-task" during the practice session. "Off-task" was defined by the coach as not watching the action on the floor, sitting on the floor or leaning on the wall, talking to other players except to encourage them in practice, not listening to the coach, walking during transition time between drills, and getting a drink without permission.

3.14 DEFINITION OF THE INDEPENDENT VARIABLES

The dependent variables in this study were chosen as the problem area in the sport environment was identified. The independent variables were a combination of techniques that had been shown to be effective in a sport environment, as was the public posting of earned points in the Golden Support Game and techniques that had been shown to be effective but not in the sport environment, as was the use of a contingency contract to improved attendance to practice. Also used were techniques not reported earlier in the literature. An example of a new intervention can be seen in the Appropriate Game Dress study in which a telephone based intervention is used for reminding athletes to bring the appropriate team dress to school on game days.

3.15 CONTRACTING FOR ATTENDANCE

The independent variable in this study was the application of a contingency contract (Appendix D). This athlete had never experienced contracting in either the home or school environment. The criterion
for the contract called for the athlete to come to practice on time and appropriately dressed in order to receive the specified activity reinforcer at the end of practice. The practice environment was the site of all contracted behavior, contracting did not extend to the game environment.

3.16 APPROPRIATE GAME DRESS

The independent variable in this study was the division of the team into five natural units, i.e., the point guard group, the right wing group, etc. (Appendix E). When prompted by the coach, each first string member became responsible for calling the second string member the night before the game and reminding her which color jersey and shorts, either blue or white, to bring to school the next day. The second string member then called the third string member to remind her of the color of the jersey and shorts to bring to school. Each member of the team was provided with a list of who was in their group and the respective positions and phone numbers of each group member.

3.17 SHAPING FOUL SHOOTING

In this study the independent variable was the application of a shaping procedure to increase the distance of shooting a foul shot at an accuracy rate of 85 percent. Shaping occurred within the response topography of the foul shot. The magnitude, or the intensity, of the shot was changed as the distance from the backboard increased. The topography of the response remained constant throughout all phases of
the study. The goal behavior was shooting a foul shot with 85 percent accuracy from the foul line.

3.18 PERFORMANCE CONSISTANCY

The independent variable in this study was a set of performance feedback charts that were posted in the locker room at the beginning of each practice session. Foul shooting was a part of every practice session. Individual feedback was given on the accuracy of the last days performance of foul shooting during practice. Also posted for each player was the total percent of shots made for the weeks' practice sessions. The player would be told by the coach to attempt 10 foul shots at some point during the practice session. They would then be told to report the number of shots made out of the total. This number would then be posted the next day on the players chart. The coach reviewed the charts in the locker room and commented on any improvement made by any player.

3.19 PERFORMANCE CONSISTANCY - PERFORMANCE FEEDBACK

The independent variables in this study were the presentation of either a punishment contingency or a reinforcement contingency. Subjects who were already receiving feedback on their foul shooting performance began to set goals for their performance and received either a punisher, running laps, for not meeting their goals or a reinforcer, an edible, for meeting their goals. Signs were posted in the locker room indicating which contingency, A or B, was in effect for
that practice session. "B" days indicated that achievement of the pre-set goal resulted in avoidance of running laps of the difference between the goal and the actual number of baskets made, a punishment condition. On "B" days no reinforcer, other than avoidance of the punisher, was given for achieving the goal itself. "A" days indicated that making the pre-set goal would result in a edible reinforcer while not making the goal would result in withholding of the reinforcer, but no punishment condition would be presented, i.e. they did not have to run laps. Before each member of the team began to shoot foul shots she selected a target goal for this practice session. The athlete verbally stated her target goal to the assistant coach. She then attempted her foul shots. Upon completion of the series of foul shots she reported the number of shots that were successful. This was then compared with the goal she had set for herself prior to the attempt. The athlete was then either handed an edible reinforcer (A condition - goal achieved), told that she didn't make her goal (A condition - goal not achieved), told that she did make her goal (B condition - goal achieved), or told the number of laps to run around the gym (B condition - goal not achieved). These conditions were consecutively altered over six practice sessions.

3.20 PERFORMANCE CONSISTANCY - GOAL SETTING

The independent variable in this study was the delivery of verbal positive reinforcement regardless of the outcome of the athletes self-selected foul shooting goal. In this study, athletes were asked
to set a goal for the number of shots they would make prior to their attempts at shooting foul shots during the practice session. The athletes were not under any imposed contingency to perform at their pre-set goal. When the athlete did not achieve her goal she was encouraged to try harder at the next practice. When the athlete did achieve her goal she was congratulated on her success and encouraged to do even better at the next practice.

3.21 Changing the Verbal Behavior of A Coach

Negative comments from one player to another and from the coach to players were recorded for the duration of each practice session. Negative comments were defined as negative feedback directed to an individual or the team without any corrective information. Examples, "You guys suck"; "No Toni that's wrong"; "No effort, we are a terrible team."; etc. Positive comments from the coach to a player or from one player to another was defined as praise directed to an individual or the team. Positive feedback may or may not include corrective information. Examples, "Nice work, Stacey"; "Good Game"; "Good follow through, Kim"; etc. The intervention was made at the level of the coach. The independent variable in this study consisted of sharing the declining number of positive comments between players shown in the baseline data with the coach and suggesting that she use the hand held counter, supplied to her, to record the number of positive statements she made to the team.
3.22 THE GOLDEN SUPPORT GAME

The independent variable selected to end the quiet bench problem was a game called "Golden Support." The "Golden Support" points were awarded to each player each time they; 1) went to the huddle during timeouts and quarters without being prompted to do so, 2) participated in the Lady Lancer yell, 3) helped the coach yell instructions to the players on the court, 4) supported teammates as they came off the court, and 5) were a gracious winner/loser (shook hands with the opponent at the conclusion of the game, win or lose). These behaviors were listed on the "Golden Support" chart posted in the locker room before the start of each practice (Appendix G). Each girl competed with the others on the bench for the highest number of points during the game. At the next practice session the girl with the highest score for the previous night's game had that score recorded in gold ink next to her name on the chart. All other players scores were posted in black ink next to their names.

3.23 ON TIME TO PRACTICE

The independent variable in this study was presentation of points to all athletes who were on time to practice. The athlete(s) who accumulated the most points for the week, a maximum of five, would be allowed to pick a skill game during the last 15 min. of practice on Friday. The independent variable was never put into effect in this study. In measuring the baseline level of the dependent variable, number of athletes on time to practice, it became obvious that the
majority of athletes were on time to practice. In fact, only one athlete had a chronic problem being on time to practice and it was easier to deal with this problem on an individual basis. For a further discussion see the "Contracting for Attendance" study. The coach decided that being on time to practice was not as much of a problem as she had anticipated and the recording of the data was discontinued.

3.24 INCREASING "HUSTLE" DURING PRACTICE

The independent variable in this study was a poster placed in the locker room listing what the players were to do to be considered "on task" or a "hustling" team. This poster encouraged the team to do the opposite of what the coach had defined as "off task" behaviors, and was called the "Lady Lancer Do's." The poster was placed in the locker room before each practice beginning on 11-23-87 (Appendix H). The coach would prompt team members throughout the practice session to stay on task.

3.25 PROCEDURES

This section describes the method of application of the independent variable to the dependent variable in each of the studies in this research. This section identifies the person, in the applied setting, who recorded the occurrence of the dependent variable in both the baseline and intervention conditions. The manner in which reliability of the measures of the dependent variables were assessed is described. Also identified is the recording method used to collect the data.
3.26 CONTRACTING FOR ATTENDANCE.

In this study Player 15 was introduced to a contingency contract (Appendix D). This contract was written by the coach and the experimenter. The player had never experienced behavioral contracting in either the home or school environment. The coach routinely played a game at the end of practice. In this game the coach would line the team up along the blue line 5 minutes from the end of practice. The coach would then select a player from the line. If a player could make a basket from the foul line the team would be dismissed from practice early. Being selected first was a highly prized position because if the player made the shot she would receive a great deal of social reinforcement from other teammates. Player 15 was told that meeting the contracted contingencies guaranteed that the coach would give her the first shot at the basket at the end of practice. The athletes baseline and intervention measure of attendance was taken from the data recorded in the coach's attendance book. The coach recorded these data. Baseline was recorded for 28 days, intervention measures were recorded for 5 days, and a return to baseline conditions were recorded for 6 days. Reliability was assessed in 18% of the baseline sessions, 40% of the intervention sessions, and 33% of the follow-up sessions. Overall reliability was assessed for 23% of the sessions.
3.27 APPROPRIATE GAME DRESS

The intervention consisted of a list of phone numbers of all team members divided into groups by position on the team (Appendix E). The first string member of the position would then call the second string member the night before the game to remind her of the correct game clothing to bring to school the next day. The second string member would then call the third string member of the group and remind her of the correct game clothing to bring to school the next day. All baseline and intervention measures were taken from the coaches play book. If the player did not bring the correct clothing for the game she did not play in the game and would be absent from the line-up. She would appear as present but scratched in the coaches play book. One player was randomly selected from the team and asked by the assistant coach if she had been called the night before by the player that was ahead of her on the Telephone Tree. All responded that they had been called by the appropriate player. Baseline measures were taken for six consecutive games. Intervention was introduced to the following six consecutive games. Reliability was assessed for 6% of the sessions in baseline and 6% of the sessions in the intervention phase. Overall reliability was assessed for 16% of the games.

3.28 SHAPING FOUL SHOOTING

After shooting foul shots with the team as part of their regular practice routine, player's 11, 12, and 13, received individual instruction on shooting a foul shot. The assistant coach used diagrams
(Appendix F), modeling, practice in unison, and physical prompts to convey the correct form to use when shooting a foul shot. Position of the feet, hips, and shoulders to the basket was taught. How to hold the ball and development of a grip on the ball was discussed. The athletes were also taught to shoot the ball, not at the basket, but off the backboard just above the basket. Each Player then practiced shooting without the ball while the instructor used modeling and physical prompts to correct errors in form. During the first session Player 12 received instruction and then was allowed to practice shooting 20 shots at the three foot mark from the backboard (in direct line with the middle of the top of the key) and to report the number made to the instructor. The assistant coach would then go to Player 13, and then Player 11. Upon achieving 85% accuracy for three consecutive practice sessions (60 foul shots) the player would be moved back to the next 3' mark from the center of the basket and instruction on shooting foul shots from this distance would begin. Upon achieving 85% accuracy at this point the player would be moved back another 3 feet until they were shooting from the foul line at the top of the key, 15 feet from the backboard. Baseline and intervention measurements were taken for each player's 51 intervention sessions. Reliability of the self-reports of shooting accuracy was randomly checked using a trained observer who watched one player throughout her 20 attempts and recorded the number of successful and unsuccessful shots. This was then compared to the number reported by the subject. Reliability was assessed once in each phase for each player. Overall reliability was assessed for 12% of the total number of sessions for each player.
3.29 PERFORMANCE CONSISTANCY

The procedure in this study consisted of public posting of the foul shooting scores for each member of the team. The number of baskets each athlete made during the last practice session was posted in the locker room prior to the beginning of the next day's practice session. All athletes received feedback. Also posted for each player was the total percentage of shots made for all practice session by week. A foul shooting drill was a part of every practice session. The coach would set a number of attempts every player was required to take. The player would self-select the number of shots she thought she could make out of the total number of attempts determined by the coach. She would then report this number to the assistant coach and begin taking her shots. Upon completion of her attempts she would than self-report the number of successful shots she made to the assistant coach. This number would then be posted on the player's chart the next day in the locker room. All baseline and intervention data were based on the athletes self-report of the number of successful shots for each of her attempts. Reliability of self-reports was checked by team managers/observers. They were told to report the number of shots made by a randomly selected player and this number was compared to the report given by that player. Reliability was assessed for all sessions, 100%.
The procedure in this study is the same as the procedure in the Performance Consistency study. The procedure varies in this study in that the consequences of achievement of the self-selected goal were dependent upon the alternating contingencies. These contingencies were identified by charts posted in the locker room identifying either "A" or "B" conditions. Upon identifying which condition was in effect, the athlete verbally stated her goal to the assistant coach, attempted her shots and reported back to assistant coach the number of shots made. The number of successful shots was then compared to the number she stated she would make prior to her attempts. If the self-selected goal was achieved under the "A" contingencies, the athlete was given an edible reinforcer. If the self-selected goal was not achieved under the "A" contingency the athlete was told that she did not meet her goal and to try harder the next time. Under the "B" contingencies, if the self-selected goal was achieved the athlete was told she had made her goal. If the goal was not achieved under the "B" contingency, the athlete was asked to run the number of laps around the gym that were equal to the difference between the self-selected goal and the number of actual shots made. Data were collected by the assistant coach. Reliability was assessed using manager/observers to count the number of shots made by a randomly selected athletes. This number was then compared to the number of successful shots reported by the athlete. Reliability was assessed for 100% of the "A" and "B" sessions.
3.31 PERFORMANCE CONSISTANCY - GOAL SETTING

The procedures in this study were the same as those reported in the Performance Consistancy Study. The difference occurs when the athlete is asked to self-select both the goal and the number of attempts she will make in order to achieve that goal. The athlete verbally reported both the goal and the number of attempts required to make that goal to the assistant coach. Upon completion of her self-selected number of attempt shots, the athlete report to the assistant coach the number that were successful. If the goal was achieved the athlete was congratulated on her success. If the goal was not achieved the athlete was encouraged to do better during the next practice session. All data were collected by the assistant coach and were based on the athletes self-reports. Reliability of the athletes self-reports was assessed using managers/observers who counted the number of successful shots made and the total number attempted. The manager/observer's data were then compared to the data reported by the athlete. Reliability was assessed in 100% of the intervention sessions.

3.32 CHANGING THE VERBAL BEHAVIOR OF THE COACH

The procedure in this study consisted of sharing baseline data with the coach and providing a hand held counter for her to count the number of positive verbal statements she made to the team. The hand held counter served two purposes; 1) it provided the coach with a discriminative stimulus to use more positive verbal statements with the team, and 2) it provided a measure of the number of positive verbal
statements the coach made. The occurrence of the positive and negative verbal behavior between the coach and the players and between players was recorded for the duration of each practice session by the assistant coach using event recording. Each comment was recorded as one event. One reliability check was made for each dependent variable during each week of the season. Team managers were trained to identify each of the dependent variables. A team manager would record, for one randomly chosen 5 minute period, the occurrence of positive or negative verbal statements from the coach to the player or between players. Not every dependent variable was checked every day. The team manager serving as a recorder of the occurrence of the dependent variable varied across days. The reliability of the occurrence of the dependent variable was assessed by four different team managers during the course of the season. Reliability for each dependent variable was assessed for 5% of the baseline and intervention sessions. Overall reliability was assessed for 31% of the practice sessions.

3.33 GOLDEN SUPPORT GAME

The procedure in this study consisted of setting up a game. The Golden Support Game consisted of a poster placed in the locker room with all team members names down the side and the teams to be played across the top. At the bottom of the poster was listed the behaviors required to earn points during the game while the player was on the bench. The Golden Support game was introduced and the rules discussed during a pre-practice meeting. Points were awarded to each player on
the bench who demonstrated any of the behaviors listed on the bottom of the chart. The player who was awarded the most points during the game had the number of points recorded by their name, under the appropriate game, in gold ink. All other players point totals were recorded in black ink. At the end of the season, the athlete with the highest point total was given a tangible reinforcer, a gold "Number 1" charm with her name engraved on the back. The assistant coach used event recording to measure the occurrence of the behavior under baseline and intervention conditions. It was not possible to collect baseline data as the Coach was anxious to end the problem of a quiet bench. Reliability measures were not possible because all observer/managers were occupied with their game duties.

3.34 ON TIME TO PRACTICE

The procedure in this study was not implemented. Baseline measure of the occurrence of the behavior by the assistant coach using event recording indicated a very infrequent occurrence of the problem behavior. The coach decided that getting athletes to practice on time did not occur often enough for it to be a primary concern and the measurement of the behavior was ended.

3.35 INCREASING "HUSTLE" DURING PRACTICE

The procedure in this study consisted of placing a poster in the locker room listing a set of desirable practice behaviors identified by the coach. This list of practice behaviors was known as the "Lady
Lancer Do's." The poster was introduced by the coach in a pre-practice meeting and the list of desirable practice behaviors were read by the coach to the team. The coach would then prompt team members throughout the course of the practice session to stay on task. The assistant coach used a momentary time sample at 5 minute intervals to determine the number of athletes who were off-task. Off-task was defined as performing a behavior that was the opposite of a behavior listed on the "Lady Lancer Do's" poster. Therefore, any member of the team who was out getting a drink without permission, looking at the ceiling, or leaning against a wall, at the end of each 5 minute interval was counted as being off task. The baseline and intervention measurement of the behavior were recorded using 5 minute momentary time samples for the duration of the practice session. Reliability was assessed by asking an observer/manager to count the number of players she saw not following the "Lady Lancer Do's" poster at the end of one randomly selected five minute interval. Reliability was assessed once a week, or 31%, of the season.

3.36 EXPERIMENTAL DESIGNS

This body of research is composed of seven different studies. The most frequently used design in these studies is the A-B single subject research design. However, the A-B design was not the only type of research design used. The exceptions to the use of an A-B design are; the Shaping Foul Shooting study, which used a multiple baseline across subjects design, and the Performance Feedback and Goal Setting study,
in which an alternating treatments design with initial baseline phase and final best treatment phase (Heward, 1987, p. 187) was used. The following paragraphs identify those studies which used a particular type of research design and a description of that design.

3.37 THE A-B DESIGN

The studies that used an A-B design are; Contracting for Attendance, Appropriate Game Dress, Shaping Foul Shooting, Changing the verbal behavior of a coach, The Golden Support Game, and Increasing "Hustle" during practice. Although each of these studies involved the use of different independent and dependent variables the design through which those variables interacted was the same for all studies. In an A-B design, the letter "A" represents the baseline or pre-treatment level of the dependent variable. The letter "B" represents the application of the independent variable, or treatment, to the dependent variable, or behavior of interest. The dependent variable is monitored throughout both the baseline (A) and the intervention (B).

The A-B design has many threats to internal validity. Campbell and Stanley (1966) identify history, maturation, and uncontrolled extraneous variables. Each of these threats to internal validity limit the extent to which the changes in the dependent variable can be attributed to the presentation of the independent variable. These uncontrolled threats also limit the ability to draw conclusions concerning the effect of the treatment.
The many threats to the internal and external validity of the A-B design do not preclude its use in applied studies. The A-B design is especially well suited for use in applied studies where the behavior of interest is a learned skill or irreversible effect. Once a skill is learned, withdrawal of the knowledge of the skill is impossible but would be required in order to return to baseline. For example, it is not possible to eliminate the knowledge the athlete has acquired during shaping of the foul shooting skill because it has now become part of their behavioral history. Another consideration is the ethics of withdrawing an effective treatment. While the problem behaviors identified in this research are not life threatening, withdrawal of the intervention may preclude the participation of the athlete in competition. For example, if an athlete did not bring the correctly colored jersey to wear in a game, as in the Appropriate Game Dress study, it would be reasonable to expect that that athlete would not prohibited from participation in game competition.

The threats to internal and external validity can be minimized if the A-B design is replicated across many individuals. External and uncontrolled environmental variables are less likely to influence the change in the level of the dependent variable at the same time as the presentation of the independent variable for numerous subjects. As Sidman (1960, p. 74-75) states, "The purpose of intersubject replication is to determine whether uncontrolled and/or unknown variables might be powerful enough to prevent successful repetition...each additional experiment increases the
representativeness of the findings". In many of the studies each member of the team served as a replication of the effect of the independent variable on the dependent variable to the extent that they demonstrated a behavioral change in the B condition.

3.38 THE MULTIPLE BASELINE DESIGN

A single subject research design that uses the concurrent replication of A-B designs across different subjects, settings, or behaviors is a multiple baseline design. The multiple baseline design was first described by Baer, Wolf, and Risley (1968). They describe a design in which the experimenter applies the experimental variable to one behavior, and notes the change in the level of that behavior while holding all others in the baseline condition. If no change in any other behaviors' baseline has occurred the experimenter begins to systematically applied the experimental variable to other behaviors.

In the study, Shaping Foul Shooting, a multiple baseline design across subjects was used to measure the change in the performance data for three athletes prior to and following the application of the treatment variable.

In multiple baseline design across subjects, all subjects in the study experience baseline conditions concurrently. After steady state responding has been achieved under baseline conditions, the independent variable is applied to one of the subjects while baseline conditions remain in effect for the other subjects (Heward, 1987b, p. 204). Following a stable baseline condition the independent variable is
introduced to Player 12. Players 13 and 11 remain in the baseline condition during the introduction of the independent variable to Player 12. When the level of responding for Player 12 becomes stable, the intervention is introduced to Player 13. Player 11 remains in the baseline condition until Player 13 reaches stability in responding. Following a level of stable responding for Player 13, Player 11 is then introduced to the independent variable. It is in this manner that all subjects, settings, or behaviors are introduced to the independent variable in a multiple baseline design.

In a multiple baseline design a function relationship is demonstrated when the level of the dependent variable changes as a function of the application of the independent variable to each separate subject, setting, or behavior. The demonstration of a functional relationship is dependent upon two assumptions, 1) that the behaviors are functionally independent of each other, and 2) that the behaviors have enough similarity with each other to show a change when the same independent variable is applied (Tawney & Gast, 1984, p. 227-28). In the study Shaping Foul Shooting, condition 1 is satisfied through the use of three independent subjects, none of whom influenced the foul shooting behavior of the others, and condition 2 is satisfied by measuring the same dependent variable for all three subjects.
Another type of single subject research design used in this research is the alternating treatments design. The alternating treatments design was first described by Barlow and Hayes (1979). In this design, two or more experimental variables are rapidly alternated in their presentation to the dependent variable. This design employs the principle of stimulus discrimination. A distinct stimulus is associated with the varying treatments. In the study, Performance Consistency, different colored signs were placed in the lockeroom to allow the subjects to discriminate between the presence of "A" or "B" treatment conditions. By rapidly altering the consecutive presentation of the treatment conditions, "A" or "B", it is possible to determine which condition promotes the greatest improvement in behavior.

A variation of the alternating treatments design was used in the study, Performance Feedback and Goal Setting. This variation employed the extended initial baseline phase and a final best treatment phase (Heward, 1987c, p.187). The extended baseline phase in this variation of the alternating treatments design is used to control for practice effects, i.e. improvement in the skill that may occur as a result of the amount of time spent practicing the skill, rather than an improvement in the skill due to the application of the independent variable. This was followed by the alternating treatments phase, i.e., rapid alteration of the "A" and "B" contingencies. This phase was followed by a best treatment phase. The best treatment phase is simply the independent variable condition under which the dependent variable demonstrated the most improvement.
All experimental designs in single subject research methodology are based on what Sidman (1960) and others have referred to as baseline logic (Tawney & Gast, 1984, p.187). Baseline logic is the experimental prediction that when the condition of steady state responding occurs, if additional observations were made under unchanged conditions, there would be no important changes in responding. The inductive logic behind the predictive power of the stable baseline state is known as affirming the consequent.

When an experimenter decides to apply the independent variable in response to a stable baseline, an explicit assumption has been made: If the independent variable were not applied the behavior, as indicated by the baseline data path, would not change. Withdrawal of the independent variable, when followed by a return of the data path to baseline levels, provides the verification of the independent variables effect and replication of the stable baseline. All components of the baseline logic are necessary for an experimental analysis.

The A-B design does not provide the verification and replication components necessary for support of the baseline logic, it is therefore classified as a quasi-experimental design. In this design the dependent variable is repeatedly measured under controlled baseline or "A" conditions and the intervention or "B" conditions. After several baseline measures are taken the independent variable is applied. The dependent variable is measured continuously throughout the study. Any changes in the independent variable are presumed to be due to the
dependent variable. Since the effect is not replicated with the same subject there is no assurance that the independent variable is responsible for any observed behavioral changes (Tawney and Gast, 1984, p. 191). The A-B design does not allow for a return to baseline conditions and there is no concurrent measurement of similar yet functionally independent behaviors, as occur in a multiple baseline design, therefore the natural course of the target behavior in the absence of the intervention can not be determined. In terms of the baseline logic, the A-B design does not provide the conditions necessary for the prediction of the continued stability of baseline responses, verification of that prediction, or replication of that prediction.

In the multiple baseline design the prediction is made that if the application of the independent variable to the first subject, setting, or behavior, did not occur baseline responding would remain in a stable state. This prediction is verified when the concurrent and continuous measurement of the baseline responses of the other subjects, settings, or behaviors, remain stable following the introduction of the independent variable to the first subject, setting, or behavior. The predicted effect of the independent variable is inferred by the lack of change in the baseline responses of the other subjects, settings, or behaviors. The prediction is replicated by continuous measurement of the baseline level of responding over several different subjects, settings, or behaviors. Verification is indirectly provided each time the baseline level of responding for each of the different subjects,
settings, or behaviors, changes in concurrence with the application of the independent variable. A simultaneous change in the level of responding with the presentation of the independent variable increases confidence in the strength of the functional relationship. The number of replications necessary to establish the effect or strength of the independent variable in a multiple baseline design is dependent upon the audience that the design is to serve.

In the alternating treatments design one data point serves all three functions: it is a basis of prediction for future levels of the behavior under that treatment condition, it provides verification of previous predictions, and it is a replication of the differential effects produced by the other treatments that are part of the design (Heward, 1987, p.182).
CHAPTER IV
RESULTS

Results of each study are presented separately. The studies are presented in the chronological order in which they occurred during the season. This section presents each study by providing a brief re-statement of the problem, a graphic presentation of the data, an explanation of the data, and discussion. Also included in each section is the interobserver agreement for the dependent variable in that study. A calendar charting the collection of baseline data, application of the intervention and concluding date of each study is provided.

4.1 PERFORMANCE CONSISTANCY

Statement of the Problem

This is the first of two problems identified during a pre-season meeting with the coach. The problem identified by the coach was the need for improvement in level and consistency of performance of foul shooting. This study was designed to measure the effects of altering the consequences of achieving a foul shooting goal. It was decided that if a consequence could be found that improved the level and consistency of the players foul shooting score it would used by the
coach throughout the season. This study began on 11-6-87 and was concluded on 1-6-88. These data may be found on figures 1 to 15.

Interobserver Agreement

The measurement of the athletes self-reported successful foul shots, the dependent variable, in this study was taken by trained observer/managers. An observer/manager was asked to watch and record the number of successful foul shots achieved by a randomly selected athlete during the foul shooting drill for each of the practice sessions. The observer/managers' record of successful foul shots was compared to the athletes self-reported score. Consequences were delivered based on the athletes self-report. The observer/managers used to observe and record the data were varied with the practice session. IOA was 100%.

Explanation of the Data

The baseline measurement of each of the athletes free throw shooting level and consistency began on 11-6-87 and continued through 11-27-87. The baseline data for each athlete were publicly posted in the locker room. An extended baseline was employed in this study to control for any learning effects due to practice. Baseline data were gathered for 15 practice sessions. The intervention was in effect for 17 practice sessions.

After 3 weeks of practice, in which public posting of the previous practice sessions' successful foul shots resulted in stable baseline all members of the team experienced daily alternating "A" or "B" contingencies that imposed external consequences to the achievement or
failure of their self selected foul shooting goal. Each athlete was asked to set a goal of successful foul shots that she would try to achieve within the number of foul shots the coach directed the team to attempt. The alternating contingencies intervention began on 11-30-87 and continued through 12-11-87. Athletes did not increase the number of successful foul shots or their consistency in making successful shots. There was little change in level or trend between the "A" or "B" treatment conditions and the prior public posting baseline. The alternating contingency intervention was in effect for 6 practice sessions.

In the next phase of the study, which began on 12-14-87 and continued through 1-6-88, athletes were asked to again choose their goal, and also the total number of shots they would need to attempt in order to meet that goal. In other words, each athlete was asked to not only select her personal goal but also the number of times she would have to shoot the foul shot in order to achieve the goal. The difference between the personal goal and number of attempts needed was smaller for the better players. For example, a first string player might choose a personal goal of 45 successful shots out of 50 attempted foul shots while a third string player might choose 15 successful foul shots out of 30 attempted foul shots. During this period all interventions other than public posting of the results, the baseline condition were withdrawn. This intervention continued for 11 practice sessions.
Discussion

The effect of public posting only in the baseline condition showed that it did not improve the level or the consistency of foul shots attempted by the athletes. The stable level of the extended baseline provides support for a negligible practice effect. Although the player received feedback on the last days' practice performance, feedback alone was not enough to improve the next days performance.

The results of the first phase of the study, Performance Consistency - Performance Feedback, shows a change in the level and trend of the data as compared to the public posting baseline. The results of this phase of the study do indicate that the athletes altered their self-selected goals to reflect the contingency in effect during a particular practice session. The "B" contingency resulted in the athletes setting lower self-selected goals than the "A" contingency. The lower goal setting, in the "B" condition, resulted in each athlete shooting fewer shots but it also ensured achievement of the athletes self-selected goal and avoidance of the punisher. These results indicate that the removal of an imposed consequence for achievement/failure of the self-selected goal may be necessary to promote an improvement in the level and consistency of the athletes foul shooting.

In the second phase of the study, Performance Consistency - Goal Setting, there is a marked increase in the level and trend of the data for some athletes. The application of the procedures, self-selected number of attempts and goal setting, resulted in an increase in the
percentage of foul shots achieved. However, some athletes improved their foul shooting percentage more than others. Player 8 shows the same increasing trend in the second phase of the study as was shown in the first phase of the study. This player did not change her percentage of successful shots with the changing phases. Player 10 also demonstrated a level of consistency throughout all phases of the study. Like Player 8, Player 14 shows an increasing and stable trend regardless of the phase of the study. Player 15 presents inconclusive data due to absences.
Figure 1: Performance Consistency Player 1
Figure 2: Performance Consistency Player 2
Figure 3: Performance Consistency Player 3
Figure 4: Performance Consistency Player 4
Figure 5: Performance Consistency Player 5
Figure 6: Performance Consistency Player 6
Figure 7: Performance Consistency Player 7
Figure 8: Performance Consistency Player 8
Figure 9: Performance Consistency Player 9
Figure 10: Performance Consistency Player 10
Figure 11: Performance Consistency Player 11
Figure 12: Performance Consistency Player 12
Figure 13: Performance Consistency Player 13
Figure 14: Performance Consistency Player 14
Figure 15: Performance Consistency Player 15
4.2 INCREASING "HUSTLE" DURING PRACTICE

Statement of the Problem

This was the second of two problems identified by the coach during a pre-season meeting. She indicated that the team lacked "Hustle" during practice and she felt this lead to a lack of "Hustle" during games. She stated that she believed in the maxim, "You play like you practice", and wanted to see more team "Hustle" during practice. Before the baseline data were taken the coach was asked to list those behaviors the players engaged in that she felt indicated a lack of "Hustle." She listed; not listening to the coach during instruction, walking between drills, not watching the action on the floor, sitting on the floor or leaning on the gym walls during practice, not knowing which position to cover, and getting drinks without permission. It was decided that these behaviors would indicate that the player was "off task". A player who engaged in the opposite of any of these behaviors, i.e., listening to the coach, not leaning of the gym walls, knowing her position, etc., would be considered "on task" and engaging in "Hustling" practice behaviors.

The goal of this study was to increase "on task" or "Hustling" behaviors and decrease "off task" behaviors. Baseline measurements were taken from 11-6-87 to 11-19-87. The intervention was presented on 11-20-87. Intervention effects were measured from 11-20-87 to 1-25-88. Data for this study may be found on figures 16 and 17. Figure 16 presents the actual number of players "off task" for the total number of intervals per practice session. Figure 17 presents the percentage
of players "off task" for the total number of intervals per practice session. Baseline measures were taken for 10 practice sessions and the intervention was in effect for 28 practice sessions.

Interobserver Agreement

In this study a momentary time sample was taken at every five minute interval of the number of players engaged in "off task" behavior. Interobserver agreement was assessed using an observer/manager who, at the end of one randomly selected five minute interval, counted the number of players she saw engaging in "off task" behaviors. The total number of players engaging in "on task" behaviors was compared to the total number of individuals in the group. This measurement was taken during each week of the study. Each interval in which both observers scored the occurrence of the off task behavior or the non-occurrence of the off task behavior was counted as an agreement. Using an exact agreement measure, both the occurrence and the exact frequency of the behavior were required for an agreement between observers. Interobserver agreement was calculated as follows; agreement frequency / agreement + disagreement frequency X 100 = % agreement. IOA = 66%.

Explanation of the Data

The data indicated a high level and positive increasing trend in the number of athletes off task by session during the baseline phase of this study. The highest number of athlete's counted as being "off task" is 100, 36%, for the total two hour practice session of 24, 5 minute intervals. Total opportunities for players to be "off task" = 0 to 360, i.e., a momentary time sample of a 2 hour practice session =
24, 5 minute intervals with an opportunity for all 15 players to be "off task" at the end of each interval, $15 \times 24 = 360$. There was a significant change in the level and trend of the data path after the intervention. There was a reduction in the actual number of athletes off task as well as a reduction in the variability of the number of athletes off task per session. The level of the data path shows a downward trend with some variability after introduction of the intervention.

**Discussion**

The increasing level and positive trend of the baseline data path may have been due to the novelty of the activity for the athletes on the team. However, this would not explain the continued increase in the "off task" behaviors. The placement of a poster in the locker room would not have produced the dramatic decrease in "off task" behaviors if the coach had not followed up on the "off task" behaviors by delivering punishment for their occurrence. The coach would frequently check the "off task" data during recording. She would then deliver a punisher to the team based on the number of individuals counted, thus far, as being "off task". The coach would require the team to run laps equal to the number individuals counted as being "off task."

The reduction in the number of players being "off task" can not be attributed solely to the placement of the "Lady Lancer Do" chart in the locker room. More likely it was the presentation of the punisher as a consequence of "off task" behavior that reduced its frequency in the practice sessions. At best the poster served as a prompt for the team
to occasion avoidance of the "off task" behavior, and a prompt for the coach to provide consequences for engagement in "off task" behavior.
Figure 16: Players "Off-Task"
Figure 17: Players "Off-Task"
4.3 ON TIME TO PRACTICE

Statement of the Problem

The problem area in this study was identified following the first week of try-out practice for the team. The coach felt that there were too many athletes late to try-out practice. She identified this as a concern in that the number of athletes who were late might increase as the boredom of the long season set in. The problem area in this study was the number of athletes who were not dressed, in the locker room, and ready to practice at the scheduled start of practice, 3:15 or 5:15, depending on the day of the week. This study began on 11-9-87 and ended on 12-5-87. Baseline data were collected during 18 practice sessions. Figure 18 provides a visual representation of these data points.

Interobserver Agreement

In this study the number of athletes on time to practice was taken from the coach's attendance book record, a permanent product. IOA was 100%.

Explanation of the Data

The data show a high level of variability in the number of athletes on time to practice throughout the first month. The number of players who were on time to practice as measured at the scheduled start of the practice session is highly variable. The baseline data show a highly variable and unstable path. This range of variability decreases during the first week of the second month in which competition starts. Following the tenth practice session the high level of variability in the data path decreases, but is still unstable. Baseline data were
collected at each practice session between 11-9-87 and 12-5-87. Baseline data only were collected.

Discussion

The data show that there were many athletes late to the practice sessions. However, the coach was also late to many practice sessions. The coach in this study was also a full time teacher in this junior high school and had "Bus duty" on various days that caused her to be late to practice. The coach decided that the number of athletes who were late to practice was tolerable for her and that intervention was not needed. Baseline data collection was stopped following the eighteenth practice session.

Contributing to the athletes tardiness was their knowledge of the fact that the practice session itself often did not start on time. The boys and girls teams alternated times and days of their practice sessions in the schools one gym. The boys team, due to their winning record, received first choice of times and days for the gym. When the boys team practiced first, the girls coach had difficulty getting the boys coach to conclude his practice sessions within his allotted time. When the boys coach did not end his practice sessions on time, the girls practice not only started late but was also shortened considerably because the gym was rented out to a community group immediately following the scheduled end of practice. The girls coach had no leeway between the two groups. The athletic director ignored the situation when it was brought to his attention.
Figure 18: On Time To Practice
4.4 SHAPING FOUL SHOOTING

Statement of the Problem

This study concentrated on improving the foul shooting skills of three team members identified by the coach as promising but lacking in this skill. Their inability to shoot a foul shot prevented the coach from placing them in a game situation. An increase in game playing time and competitive participation with the team would enhance the athletic experience for these team members and perhaps encourage them to participate in team sports more often. A shaping procedure was used to develop each athletes foul shooting skill. In this procedure each athlete was required to achieve 85% foul shooting accuracy beginning at a distance of three feet from the backboard. Achievement of the 85% criterion for three consecutive sessions at this distance allowed the athlete to move back an additional three feet from the backboard and begin shooting foul shots at a distance of six feet. This procedure continued until the athlete was shooting foul shoots from a distance of 15 feet, the foul line, at an accuracy level of 85% or better. This study began on 11-9-87 and was concluded on 1-13-88. The study was conducted in 51 sessions within the teams regularly scheduled practice times. The duration of each session varied with the athletes speed in shooting 20 foul shots. Figure 19 provides a visual representation of the data.

Interobserver Agreement

Interobserver agreement was assessed using trained observer/managers who counted the number of successfully made foul shots. Interobserver
agreement was 100%. Interobserver agreement was assessed for 30% of the practice sessions. Reliability of the subjects' self-reports were randomly checked, all subjects provided accurate self-reports.

Explanation of the Data

Introduction to Phase A for Player 12 resulted in a significant increase in the number of successful foul shots. The criterion was achieved in three sessions. The introduction to phase B caused an immediate drop in the number of successful shots made by Player 12. This drop in the level of successful shots was similar to the one that occurred following the introduction of phase A. The athlete recovered her prior level of success more quickly in phase B than in phase A and the criterion was achieved in fewer sessions. Introduction to phase C again caused a drop in the number of successful shots and recovery was made on a rapidly increasing but variable trend (Heward, 1987, p. 134). The introduction of phase D caused an immediate return to the zero level of successful shots and required sixteen sessions before the criterion level was achieved. The introduction of phase E resulted in a drop in the level of successful shots but did not cause the subject to return zero level of responding. The criterion level was achieved in three sessions.

The baseline level of successful shots was low and stable for Player 13. Introduction to phase A caused an immediate improvement in the number of successful shots per session with the criterion level being achieved following the first session. The introduction of phase B resulted in a drop in the number of successful shots made but the
subject did not return to baseline or to the introduction level of phase A. Again, for Player 11, achievement of the criterion level was reached following the first session in phase B. Phase C resulted in a significant drop in the level of data and an increase in its variability. However, the trend in phase C remained positive. The introduction of phase D resulted in the number of successful shots returning to pre-intervention levels. Phase D data are widely variable, but still maintains a positive trend. Introduction of E phase resulted in data with high variability and zero trend.

The baseline level for Player 11 was the most variable and demonstrates a slight positive trend prior to intervention. Variability remained present after the introduction of phase A where the criterion was achieved following four sessions. The first session following the introduction of phase B resulted in all attempted shots being successful. The behavior never fell below the criterion standard throughout phase B. The introduction of phase C resulted in a drop in the level of the number of successful shots, but the behavior did not return baseline level. Phase C shows two trends occurring in the same phase. The first is a level trend with high stability, the second trend is rapidly increasing with high stability. In phase C Player 11 required thirteen sessions to reach the criterion level. The introduction of phase D again occasioned a drop in the level of the number of successful shots. This drop overlaps with the baseline level of responses. Player 11 makes a rapid recovery and the data show a rapidly increasing stable trend. Phase E introduction results in a
small drop in the level of performance but Player 11 achieves the criterion level in two sessions.

Discussion

Two of the three subjects were able to achieve the target behavior of shooting 85% or better from a regulation foul line. The wide variability of subject three beginning during phase C may have been an indication of the need for breaking the behaviors to be shaped into smaller increments. That is, if the distance covered by each phase change for this subject had been reduced from three feet to one foot, the subject might have made a successful transition to the target behavior of successful shooting from the foul line.
Figure 19: Shaping Foul Shooting
4.5 CHANGING THE VERBAL BEHAVIOR OF A COACH

Statement of the Problem

The problem area in this study was the verbal punishers delivered by the coach to the players. The baseline measurement was taken due to the experimenters curiosity with the type of verbal behavior emitted by a coach in a practice situation. The coach was aware of the experimenters interest in what coaches said to players and agreed to the use of observer/managers to observe this behavior. The coach was aware that data were being taken, she was not aware of who the data were being taken on, herself or the players, or the type of verbal statements being measured, e.g., positive or negative. The marked increase in negative verbal behavior of the coach and the concomitant increase in negative verbal behavior of the athletes, signaled need for intervention. This study began on 11-9-87 and concluded on 1-25-88. Baseline data were gathered on the coaches verbal behavior for 12 practice sessions. The intervention was in effect for 18 practice sessions. Baseline data were gathered on the players verbal behavior for 19 sessions. Data were also gathered on the players verbal behavior after the intervention had been applied to the coaches verbal behavior. The graph representing the players verbal behaviors has an imposed intervention line that represents the point at which an intervention is introduced to the coaches verbal behavior, not the players verbal behavior. This was done to demonstrate the inter-relationship between the two dependent variables and the effect of the intervention on the players verbal behavior even though the
players did not have direct contact with the independent variable. Graphic presentation of the data may be found on figures 20 and 21.

Interobserver Agreement

Positive and negative statements made from the coach to the players and from one player to another were recorded for the duration of each practice session. Negative statements were defined as negative feedback directed to an individual or the team without providing any corrective information. Positive statements were defined as praise directed to an individual or the team and may or may not include corrective information. Team observer/managers were trained to record these comments. One reliability check was made for each dependent variable for each week of the study. A observer/manager would record for one randomly chosen five minute period the number of coach to player negative statements. At another randomly chosen five minute period a team observer/manager would record the number of positive statements made from the coach to the players or the team. During another random five minute period a observer/manager would record the number of negative statements made between players. At a randomly chosen five minute period a observer/manager would record the number of positive statements made between players. Not every dependent variable was checked every day. The team observer/manager also varied across days. The event of the occurrence of the four different dependent variables was assessed by different observer/managers during the course of the study. IOA range = 66-100% with a mean total of 89%. A range is reported here because the interobserver agreement varied with the assessment of each dependent variable.
Explanation of the Data

The baseline measurement of negative and positive verbal behavior between players began on 11-9-87. Negative verbal behavior is low until the 10th practice session at which it increases slightly, but does not return to its former negligible level and in fact begins to slowly increase. Positive verbal behavior is always higher than the negative verbal behavior and shows a stable trend. Following the introduction of the intervention to the coach, punishing verbal statements decrease. Positive verbal behavior following the intervention, increases dramatically in both level and trend with the final measurement of the behavior occurring at a rate of over 300 positive verbal events for one two hour practice session.

The baseline measurement of the coaches verbal behavior began 11-18-87. The delay in beginning the baseline measurement of the coaches verbal behavior, as compared to the players verbal behavior, was due to the time required to train the observers of the verbal behavior. The coaches reactive behaviors due to the measurement of the teams verbal behavior needed to occur and then subside before recording of her verbal behavior could begin. The baseline measurement of the coaches negative verbal behavior shows a sharp increase in the level of the number of punishing verbal behaviors. The level of negative verbal behaviors reaches a high of over 140 for one two hour practice session. Baseline measurement of positive verbal statements show a decreasing level and many practice sessions in which less than 20 positive verbal statements were given to players. Following the introduction of the
intervention (a hand held counter) to the coach, the coaches negative verbal behavior shows a sharp drop in level. The first two practice sessions overlap with the level of the negative verbal behavior that occurred during baseline, all other levels of negative verbal behavior are lower than the recorded baseline levels. The highest level of positive verbal behavior recorded in baseline overlaps with the first and thirtieth post-intervention data points. However, all other post-intervention levels of positive verbal behavior are above the baseline level of positive verbal statements. The post-intervention positive verbal statements data path shows a stable increasing trend and level.

Discussion

Baseline data indicate a stable and increasing trend in the level of punishing statements from the coach to the players. Data collected in baseline indicated a modeling effect may be occurring from the coach to the players. When the coach increased her negative comments to the team and/or players, the players data path suggest that they may have modeled this behavior and increased their negative comments to each other. The graphs indicate that the intervention was effective in reducing the number of negative comments and increasing the number of positive comments made by the coach to the team and/or individual players. Data presented on the graphs also indicates the suspected modeling effect on the part of the players occurred to the extent that the negative trend was reversed following introduction of the intervention at the level of the coach. It may be that the players
noticed the reduction in the coaches negative comments to the team and individual players and followed this lead by reducing the negative comments they made to each other.
Figure 20: Player to Player
Figure 21: Coach to Player
4.6 GOLDEN SUPPORT GAME

Statement of the Problem

The lack of involvement in game level competition for those players who were not likely to participate and knew it, i.e. third string players, did not become apparent until the team's first game. During the game the assistant coach noticed that third string players did not go to the team huddle or cheer for the team players on the floor. Players who typically started the game on the bench did not know their positions when they were called on to make a substitution and team members coming off the floor were not congratulated on their effort of play. This lack of interest in the game was brought to the attention of the coach. The coach suggested the need for intervention was immediate and should begin during the next game. A record of each team members behaviors during the game is provided on figure 22.

Interobserver Agreement

In this study the assessment of interobserver agreement and reliability was not possible because all of the team observer/managers were occupied with their regular managers' duties during the game.

Explanation of the Data

Baseline data were not taken. Data were recorded on a random interval basis by the assistant coach. A list of all team members was made before the start of each game. At random intervals in the game the assistant coach would place a check mark by the name of each team member who was engaged one the described "Golden Support" behaviors. Players who were on the court at the time were not awarded points
because the goal of this intervention was to improve involvement in the game for those players who were on the bench. Data recorded on the chart provide some measure of the increase in those behaviors defined by the "Golden Support" chart. From the level of the number of points each athlete received for each game there is a marked improvement in their scores and their level of involvement in the teams competition. As the season progresses, each athletes score increases.

Discussion

Results for this experiment are inconclusive at best. All athletes increased their level of participation in the game although they may have been on the bench throughout the competition. The chart shows a steady positive increase in the occurrence of those behaviors listed on the "Golden Support" chart for each athlete. The coach prohibited the withdrawal of the intervention during the course of the season, so a B-A or a B-A-B design was not possible.
### GOLDEN SUPPORT GAMES

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**Figure 22:** Golden Support Game
4.7 APPROPRIATE GAME DRESS

Statement of the Problem

The problem behavior in this study was the occurrence of inappropriate game dress for members of the team. The coach identified this behavior as a problem for her. From the coach’s perspective, if a player did not remember to bring the correct clothing for the game to school that day, the bus or game start time would be delayed while the athlete phoned or went home to get the correct clothing. If there was not time for the athlete to go home and no one at home to call, the athlete would not be allowed to play in the game. The team had no extra shirts, shorts, or shoes. This study began on 12-1-87 and concluded on 1-21-88. There were 6 sessions of baseline data and 6 sessions of intervention data. Each game represents one session. Graphic representation of these data may be found on figure 23.

Interobserver Agreement

The occurrence of inappropriate game dress was recorded in the coach’s attendance book and is reflected in the rosters for each game. A randomly selected athlete was asked if she was called by the correct person on the telephone tree and/or if she called the next person on the telephone tree also. All responded that they had been contacted by the correct teammate and identified which teammate it was. A team observer/manager was asked if the athlete was in appropriate game dress. IOA was 100%.
Explanation of the Data

Baseline data were collected from 12-1-87 to 12-17-87. The baseline shows a moderately high level of inappropriate dress on the team. Three of the teams fifteen players, 20%, showed up for the game in inappropriate game dress for the first two games of the season. Following the second game, only one team member forgot to bring the appropriate game dress. The baseline shows a decreasing level and then a stable trend of one inappropriately dressed player per game. This level was still too high for the coach because it always cut into her roster of eligible players. Following the introduction of the intervention on 12-17-87, the level of players in inappropriate game dress dropped, at the next game on 1-5-88, to a zero and this level of occurrence was maintained throughout the rest of the study.

Discussion

The use of the telephone tree as an intervention to remind players to bring appropriate clothing to school on game days resulted in 100% player compliance for the rest of the season's games. Although the graph indicates that inappropriate game dress occurred for only nine players over the course of six games, the reduction of the occurrence of this behavior to a zero level for the remainder of the season was significant. Prior to the introduction of the independent variable, the level of the dependent variable was variable and decreasing. The presentation of the independent variable resulted in stabilizing the level of the dependent variable at zero.
Figure 23: Appropriate Game Dress
4.8 CONTRACTING FOR ATTENDANCE

Statement of the Problem

The problem behavior in this study was the sudden decrease in attendance for a team member. The absence of the player was first noticed by the coach and initially attributed to the players lack of enthusiasm for the game. The player was a third string member of the team. Typically the athlete would attend school during the day but become ill during, or just before, the start of practice. The coach told the player that she would lose her membership on the team if she missed one more practice. The missed practice came and went and the coach did not enforce the described consequences. The athletes absences grew to 100% for two consecutive weeks just before intervention. The coach agreed to try contingency contracting before removing the player from the team. The contracting procedure was explained to the athlete and implemented. The study began on 11-9-87 and concluded on 2-5-88. The presence or absence of the athlete was recorded on a daily basis, however, the data are presented in percent of days absent per week. This graphic representation of these data may be found on figure 24.

Interobserver Agreement

In this study the record of attendance and absences was taken from the coaches record book and, as such, is considered to be a permanent product recording. The data were recorded in the coaches record book by the coach. The team statistician served as the observer.
Explanation of the Data

The baseline level of the percent of day's absent during a practice week increases dramatically following the first two weeks of the season. On the third week the athlete missed 80% of the practice sessions that week. The athlete misses all of the practice sessions on the fourth week. While this drops to only 50% for the next week it immediately returns to 75% and then 100% for the weeks that follow. Following the presentation of the contracting intervention, absence from both the practice sessions and games drops to a zero level. The zero level continued in the second week of intervention when the athlete specified the contract reinforcer. The athlete indicated that there was no longer any need for the contingency contract on the ninth week. The three weeks of follow up show there was no re-occurrence of this player's absence for the remainder of the study.

Discussion

Prior to the intervention, the athlete was attending practice only 51 percent of the time possible. Because of her absences the athlete was not experiencing the natural reinforcers that occur in a sport environment, i.e., social praise, skill development, trophies, etc., because she simply was not there. The behavioral contract not only provided immediate reinforcement for her attendance at practice but also allowed enough contact with the environment for behavioral trapping to occur. That is, upon emitting a relatively simple behavior the person receives access to a larger number of reinforcers. In the future, the person is more likely to engage in that behavior because of
the past history of reinforcement associated with the behaviors occurrence. This may also explain why she did not feel the need to contract any longer, the environment that occurred during practice had become sufficient in reinforcement strength to maintain the attendance behavior. The graph shows that the behavior change continued through the end of the season without re-introduction of the contracting intervention.
Figure 24: Contracting for Attendance
CALENDAR

1. Contracting for Attendance
2. The Telephone Tree
3. Shaping foul shooting
4. Performance feedback / Goal setting
5. Changing Verbal Behavior
6. Golden Support Game
7. On Time To Practice
8. Increasing "Hustle" during practice
CHAPTER V
DISCUSSION

The primary purpose of this research was to determine the applicability of behavioral interventions and procedure to the range of problems that arise during for a junior high school girls basketball coach during the course of a season. Eight problem areas were identified by the coach throughout the course of the season. The problem areas identified by the coach were the basis for each study reported in this body of research. Behavioral interventions and procedures for their application in the applied setting were developed for each of the problem areas.

This chapter includes a brief review of each study, limitations of the study, suggestions for improving the study, implications for application of the intervention in the applied setting based on the study's results, ideas for future research and a summary of the study.

5.1 PERFORMANCE CONSISTANCY - FEEDBACK AND GOAL SETTING

This study was concerned with improving the level and consistency of performance in foul shooting. This area of concern was identified by the coach prior to the start of the season. It was decided that if a consequence could be found that improved the level and consistency of
the athletes performance it could be used by the coach throughout the season. Foul shooting performance was graphed under four conditions. The first condition was a posted performance feedback chart for each player of the team. The second condition was the receipt of a reinforcer upon achievement of a self selected goal. This goal was selected form the number of attempts the coach required each player to take during the foul shooting drill. The third condition was the delivery of a punisher. The athlete was required to run the number of laps around the gym equal to the level of her self-selected goal if the goal was not achieved. The fourth condition was the removal of the imposed consequences and allowing the athlete to self-select not only her goal but also the number of attempts it would take her to achieve that goal. Results indicate that the fourth condition, where the athlete had total control of her performance, was the most effective in increasing both the number of attempted shots and number of successful shots.

The limitations of this study include the order of the contingency conditions presented to the athlete. There may have been a practice effect that caused the high level of successful shots in the fourth condition. Improvements in this study would require placing the self-management condition first or altering the presentation of the a contingent condition with a non-contingent condition and then returning to a contingent condition.

This study's application to future foul shooting performances indicate the need for placing the control of skill development in the
hands of the athlete. Athletes should be able to reinforce their own performance. Coaches should encourage the development of this self-management skill.

5.2 INCREASING "HUSTLE" DURING PRACTICE

This was the second of two problems identified by the coach during a pre-season meeting. The coach indicated a lack of "Hustle" in the behavior of players on her team. The coach was asked to list the behaviors that she felt indicated a lack of "Hustle". The goal of this study was to increase "on task" behaviors and decrease "off task" behaviors. A poster was placed in the locker room listing the behaviors to be avoided. During practice the coach would often refer to the behaviors to be avoided. Occurrence of the "Off task" behaviors in an athlete resulted in the delivery of a verbal punisher from the coach. The coach would require the team to run laps equal to the number of individuals counted as being off task. Results indicate a decrease in the number of athletes engaging in "off task" behavior.

The reduction in "off task" behavior can not be attributed to the placement of a poster in the locker room. The coaches unplanned punishment is a more probable cause of the reduction. A limitation in this study is the lack of control over the behavior of the coach. However, in an applied situation this limitation problem can not be resolved.

The results seem to indicate that delivery of a punisher is a powerful method of behavior control. While the exclusive use of
punishment in changing behavior is not recommended, its effectiveness can not be ignored. The tempered use of a punishment contingency can result in effective behavior change.

5.3 ON TIME TO PRACTICE

The problem behavior in this study was identified following the first week of try out practice for the team. Many athletes arrived late for the start of practice. The coach felt that if many athletes were late to practice at the start of the season, the problem would only get worse at the season progressed and boredom set in. Baseline data only were collected due to the inability to determine the precise time at which practice was not only scheduled but able to start. The coach had to work her practice sessions in between two other groups who were scheduled to use the schools gym.

The limitations of this study, ending the study after collecting baseline data only, were due to events outside the control of the team environment. The reduction in the number of athletes who were late to practice in the first week of the playing season is probably due to the change in the teams focus, that is from practice to competition. The athletes interest in learning plays and strategies was greater than their interest in conditioning.
5.4 SHAPING FOUL SHOOTING

This study concentrated on improving the foul shooting skills of three team members identified by the coach as promising but lacking in skill. The coach had indicated that she did not have the time necessary to individually coach these three team members. Their inability to shoot a foul shot prevented the coach from placing them in a game situation. A shaping procedure was used to improve the team members foul shooting skills. The athlete was moved away from the basket in three foot increments. The athlete was allowed to shoot a foul shot at a further distance away from the backboard only after she had achieved a shooting accuracy of 85% or better for three consecutive sessions.

The limitations of this study are those that would occur during any applied study, that is, absences of both players and observer/managers, time given for the shaping procedure varied with the practice schedule planned by the coach, and interference, talking to and retrieving their balls, by team members not involved in the shaping procedure. Improvements could be made by using the shaping procedure after regular practice was over and by allowing all athletes interested in improving their foul shooting skills to receive instruction. Also, the distance by which the athlete is moved away from the basket for each phase of the shaping procedure could be individually altered to ensure success for an athlete who is having difficulty at a certain distance. For example, if an athlete is having difficulty shooting at a distance of six feet from the basket, it may be necessary to move to a three foot distance and then increase the distance by increments of only one foot.
This study demonstrates the effectiveness of shaping as a behavior change procedure in sport. Future coaches may wish to use a shaping procedure as a part of an after practice clinic.

5.5 CHANGING THE VERBAL BEHAVIOR OF THE COACH

The problem area in this study was the verbal punishers delivered by the coach to the players. This study was initiated by the experimenter, who noticed that an increase in the coaches number of verbal punishers was being reflected in the number of verbal punishers delivered from the players to other players. The marked increase in the negative verbal behavior of the coach and the concomitant increase in negative verbal behavior of the athletes, signaled the need for change. A self-recording device, a hand held counter, was given to the coach and she was asked to record the number of positive statements she delivered to the team with the counter. This intervention resulted in an increase in the number of positive statements made to the athletes and also an increase in the number of positive statements made between the athletes. The hand held counter served as a Sd for the coach to praise the athletes.

The limitations in this study are due to recording and training techniques of observers. The observers should have been allowed more time to learn the recording procedure. Also data should have been collected on both the coach and the athletes verbal behavior beginning with the first practice session.
The practical applications of this data are many. To improve the team environment it is necessary to increase the number of positive statements delivered to the athletes. Athletes will reflect, in their own verbal behavior to themselves and teammates, the verbal behavior of the coach. Having demonstrated the relationship between coach and athlete verbal behaviors it would be important to include verbal behavior as another element of effective behavioral coaching.

5.6 GOLDEN SUPPORT GAME

The lack of involvement in game level competition for those players who were not likely to participate and knew it, i.e., third sting players did not become apparent until the team's first game. Players who were on the bench often failed to great players who were coming off the court or know their positions when they were called on to make a substitution. The coach suggested the need for intervention was immediate. The intervention consisted of a game in which players on the bench could earn points for supporting the players coming off the court, knowing their positions, go to the huddle, etc. Behaviors that earned points were listed on a chart in the locker room. Results indicate an increase in the number of points earned throughout the course of the season.

It is unclear whether or not the problem would have been resolved without the intervention. There was no baseline data. In an applied setting, baseline data are not possible, nor is it possible to withdraw an intervention that has the support of the coach. Therefore, the
results are anecdotal at best and it would be unwise to draw conclusions about the effectiveness of the intervention.

Past research indicates that this type of intervention is effective, however, that can not be demonstrated by this study. Applications based on these results are tenuous at best. In the past public posting and earning points were effective in increasing the support given to team members during practice. Public posting and point earning is effective, however, the effectiveness was not demonstrated in this study due to the constraints of the applied setting.

5.7 APPROPRIATE GAME DRESS

The problem behavior in this study was the occurrence of inappropriate game dress for members of the team. The coach had identified that as a problem behavior because it precluded the use of the athlete in the game. A telephone based reminder system was put into effect. In this intervention, each of the fifteen girls was divided up by position and groups of first, second and third string players were given each others phone number. Upon a reminder from the coach the first string players would call the second string players, and the second string players would call the third sting players. All of the athletes lived in the same school district and had local phone numbers. Prior to the introduction of the intervention only a few athletes forgot their game uniform, following the intervention no athlete forgot her game uniform.
The limitations in this study are few. The intervention could have been started earlier avoiding games in which players could not participate. Again, the only improvement in this study could have been the introduction of the telephone tree list when positions were assigned at the beginning of the season, rather than after the sixth game.

This intervention demonstrates the management of a problem that could result in the coach being forced to field a team without her best players. The telephone calls solved a major "housekeeping" problem for this coach. It would seem as though this management technique could be used in other sports in which the athletes are young and somewhat forgetful.

5.8 CONTRACTING FOR ATTENDANCE

The problem behavior in this study was the sudden decrease in practice attendance for a team member. The absence of the player was first noticed by the coach and attributed to the players lack of enthusiasm for the game. The player would attend a full day of classes, then become ill at the start of the practice session, but deny wanting to leave the team. The coach agreed to try a contingency contract procedure before removing the player from the team. A contract was initiated three practice sessions and the player followed through on all conditions. Upon the fourth presentation of the contract the player refused to sign, stating that she did not feel that she needed it any more. Results indicate that absences to practice
dropped to zero during the contracting intervention, and maintained this zero level to the end of the season.

The only change to be made in this study would have been the application of the contracting intervention to change the absences from practice behavior sooner. If the intervention had been applied sooner fewer practices would have been missed and the athlete might have been able to move up in playing position and experienced more playing time.

The application of a contingency contract has been demonstrated to be effective in increasing the practice attendance of these athletes. Other coaches may want to apply a contracting procedure on an individual basis to correct absence or other behavior problems.

5.9 FUTURE RESEARCH

The following is a list of possible research topics or areas suggested by this study.

1. The development of a systematic and planned program for untrained coaches in the application of behavioral techniques to a sport environment.

2. Identification of coaching management techniques. The application of behavioral procedures to enhance the ease with which a coach controls the practice environment.

3. Specific development of procedures that enhance the socialization of female athletes into a sport environment. Research in this area should include the development of procedures that identify and eliminate punishing behaviors directed toward the female athlete because of her participation in sport.
4. Research should be directed toward the classification of the verbal behavior of coaches and athletes and the relationship verbal behavior has on the athletes performance. It has clearly been demonstrated that the method a coach uses in coaching is an important variable in the development of athletes skills in athlete, what has yet to be explored is the effect of the type of verbal behavior used by a coach and its influence on the skill development and performance of athletes.

Based on these suggestions it is recommended that future research focus on three major areas: (a) development of behavioral coaching techniques for unskilled athletes; (b) concentration of research on the self-managed athlete; and (c) identifying the needs of female athletes and coaches.

5.10 SUMMARY

This study was conducted to demonstrate the effectiveness of applied behavior change procedure to all problems encountered by a coach during a typical season. The subjects were fifteen members of a junior high school girls basketball team and their coach. This research effort applied a client centered approach in the identification and amelioration of problems in the sport environment. The primary purpose of this study was to investigate the application of behavioral strategies as problem solving techniques when applied to all areas of the sport environment.
The second purpose of the research was to determine if the direction and level of research currently conducted in sport psychology was appropriate for solving the problems of the majority of athletes and coaches in our society. Clearly, this is not the case as most of the research conducted in sports psychology centers around issues of self efficacy and elite athletes. Little research emphasis in sports psychology has been placed on the coach athlete interaction. Only in sport behavior analysis are these key environmental variables addressed.

This research addressed areas of concern identified by the coach and the athletes with the application of behavioral change procedures. To the extent allowed in an applied setting, all problem behaviors in the sport environment were solved. The use of a single subject research design allowed for the direct and continuous measurement of behavior. This in turn allowed for immediate identification of a change in the level or direction of a behavior. In other words, the coach could actually see the decline or improvement in a players behavior over the course of a season. The transition, or transitory depending of the behavior and the environment, phases could be quickly identified and correlated with an environmental change if any occurred. These environmental changes could then be altered until the behavior returned to the correct level or improved.

In conclusion, these studies have demonstrated the effectiveness of behavioral procedures when used throughout the course of the season. Behavioral interventions are as effective when used in concert as they
are when used to ameliorate a single behavioral problem. Data collected indicates that the behavior change was socially significant for the participants in this study, that is all of the athletes who were involved in a study showed a behavior change in the desired direction, and as a consequence improved their attendance, foul shooting ability, positive verbal behavior, team support, attention during practice, and game appearance. It would seem that the use of behavioral interventions should not be reserved for a singular incident but incorporated into the design of the practice session. The use of behavioral procedures in practice and game sport environments should be as common as hoops on a court.
If court is less than 74 feet long, it should be divided by two lines, each parallel to and 40 feet from the farther end line.

Division line

Optimum length 66 feet inside all lines shall be 3 inches wide and all lines excluded end lines and sidelines shall be a minimum of 2 inches in width.

The 3-point line shall be the same color as the free throw lane line and semicircle.

The color of the lane space marks and neutral zone marks shall contrast with the color of the boundary lines. The midcourt marks shall be the same color as the boundary lines.

The minimum of 3 feet

Left End Shows
Rectangular Backboard
72 inches Wide

Preferably 10 feet of unobstructed space outside. If impossible to provide 3 feet, a narrow broken 1 inch line should be marked inside the court parallel with and 3 feet inside the boundary.

Right End Shows
Fan Backboard
54 inches Wide
Appendix B

PARENTAL CONSENT FORM

CONSENT FOR PARTICIPATION IN
SOCIAL AND BEHAVIORAL RESEARCH

I consent to participating in (or my child's participation in) research entitled:

Analysis of the applicability of multiple behavior change procedures
in a sport environment

Dr. Daryl Sledentop or his/her authorized representative has explained the purpose of the study, the procedures to be followed, and the expected duration of my (my child's) participation. Possible benefits of the study have been described as have alternative procedures, if such procedures are applicable and available.

I acknowledge that I have had the opportunity to obtain additional information regarding the study and that any questions I have raised have been answered to my full satisfaction. Further, I understand that I am (my child is) free to withdraw consent at any time and to discontinue participation in the study without prejudice to me (my child).

Finally, I acknowledge that I have read and fully understand the consent form. I sign it freely and voluntarily.

Date: 11-6-87
Signed: ____________________________
(Participant)
Signed: ____________________________
(Athlete/Student)
Signed: ____________________________
(Principal Investigator or his/hers Authorized Representative)
Signed: ____________________________
(Person Authorized to Consent for Participant - Parent)
Witness: ____________________________
(Coach)

HS-027 (Rev. 3/87) --(To be used only in connection with social and behavioral research.)
Appendix C

COACH CONSENT LETTER

WHITENALL CITY SCHOOLS
Rosemore Junior High School
4355 Rose Avenue
Whitehall, Ohio 43213

November 1, 1987

Sirs or Madam,

It is with great pleasure that I give Ann Wilson, a Psychology major student from Ohio State University permission to work under myself and the 1987-88 Rosemore Rareriad Girls Basketball team. This study will prove to be beneficial to myself as a coach, but also a great motivation for the girls.

I have received no payment or special consideration and have not been pressured to be involved in anyway.

I am looking forward to working with Ann and the Ohio State University at Rosemore this basketball year.

Sincerely,

Diane E. Rosenor
Coach
Appendix D
CONTINGENCY CONTRACT

Contract for Behavior Change

1. Player 15 agrees to:

- Be on time to practice
- Attend full practice sessions
- Bring appropriate practice clothing

for the specified time of Practice on 1/13/88

In exchange for this behavior(s),
Coach Robinson will allow me to:

Shoot the first foul shot to go home

for the specified time of Practice on 1/13/88

[Player 15]

[Coach]

[Witness]
Appendix E

TELEPHONE TREE FORM

Groups

Right Wings

Player 1 ----> Player 7 ----> Player 13
555-xxxx  555-xxxx  555-xxxx

Left Wings

Player 3 ----> Player 6 ----> Player 12
555-xxxx  555-xxxx  555-xxxx

Point Guards

Player 5 ----> Player 8 ----> Player 11
555-xxxx  555-xxxx  555-xxxx

Low Posts

Player 2 ----> Player 10 ----> Player 15
555-xxxx  555-xxxx  555-xxxx

Low Posts

Player 4 ----> Player 9 ----> Player 14
555-xxxx  555-xxxx  555-xxxx
Appendix F

DIAGRAM OF FOUL SHOOTING POSITION

1

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Appendix G

GOLDEN SUPPORT CHART

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Appendix H

LADY LANCER DO CHART

Lady Lancers
Do...

Listen to the coach
Not walk between drills
Watch the action on the floor
Not sit or lean during practice
Know their position
Not get drinks without permission

HUSTLE !!!

HUSTLE !!!

HUSTLE !!!
Appendix I

LADY LANCER RULES AND PROCEDURES

ROSEMERE
GIRLS BASKETBALL
RULES AND PROCEDURES

1. You must have a physical and insurance form on file in the office.

2. Attendance- Attendance at practice sessions is mandatory. Any player missing three practices for any reason (except a lengthy illness) will be dismissed from the team.
   - Unexcused absences will result in laps and sprints.
   - All excused absences must be approved by the coach at least 24 hours in advance.
   - Excused absences include absences from school and emergencies. A note from parent/doctor is required.

3. Practice Sessions:
   - Proper dress is required for all practice sessions.
     - T-shirt, shorts or sweats, socks, and tennis shoes.
   - No gum chewing.
   - Stand, watch, and listen when you are not involved in a drill or other activity. DO NOT TALK.
   - Always sprint to your next location during practice- NO WALKING.
   - No rough-housing or horseplay during practice- this is practice!
   - Stay in the GYM. Have parents pick you up immediately following practice. No Phone!
   - Phone is available only in case of emergency. If you are walking - go home immediately following
Appendix J

LADY LANCER RULES AND PROCEDURES

-2-

practice. I would not suggest walking home from late practices.

- Put all personal belongings in a locker (in the lockerroom) and use a lock.
- If your hair is long, it must be tied back.
- Do not wear jewelry. Coaching staff will NOT be responsible for lost or stolen personal items.

4. Team members will arrive at practice on time, dressed and ready to go. Team members will arrive for games approximately 1/2 hour before game time, and at least 15 minutes before departure time to any away game.

5. Unsportman-like conduct by any member of the squad directed toward the coach, other teammates, officials, opposing teams or their representatives will result in:

- First offense- benched next game.
- Second offense- dismissal from team.

6. Team members will "drees-up" on game days. No jeans. Nice pants or corduroys are fine.

7. Uniforms will be laundered and kept neat and clean.

8. School discipline: If you are giving someone else problems, then you are giving me problems. I WILL HEAR ABOUT IT.

9. Language, conduct: Improper language and/or conduct will not be tolerated, and will result in disciplinary action and possible suspension from the team.

10. Travel: All players must ride to and from ALL games with the team. WE ARE A TEAM. NO EXCEPTIONS.

11. Games: We will sit together as a team- home or away.

12. Officiating: Remember, officials don't call fouls, they call what look like fouls. Officials are ALWAYS right!

13. Problems: If you have a problem, see ME. Do not discuss practice with anyone else. If you have a gripe - GRIPe TO ME !

14. After careful consideration, the coach's decision is final.

This is not a social club. We are here for one reason - to
Appendix K

LADY LANCER RULES AND PROCEDURES

be the best possible basketball team we can. We will work hard, and do our best to win. These goals require personal dedication and desire.

Every player that wears a ROSEMERE basketball uniform must be a person of whom the school and community can be proud. In addition, the Ronmore player is a person possessing pride in herself as a student, an athlete, and as a member of the community. As a member of the basketball program, she represents herself and her family, as well as her teammates and coach. Constantly under the scrutiny of fellow students and the general public, she shall conduct herself in such a manner as to be respected and praised not only as a basketball player, but more importantly as an individual.

I want clean people in a clean program. A clean person is one that possesses high standards. She also possesses high goals. In order to attain those goals, she begins her lifestyle on hard work. 100% EFFORT, SACRIFICE, SECOND EFFORT, DETERMINATION, PUNCTUALITY, and PERSISTENCE. I feel certain standards must be maintained to attain these qualities, even at the junior high school level. I believe in girls sports, and in the importance they will have on your life and this community in the years to come.

I UNDERSTAND THE ABOVE RULES, PROCEDURES, AND IDEALS.

Player

Date

Parent

Date

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BIBLIOGRAPHY


