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ENVIRONMENTAL ANALYSIS AND INTERACTION

PATTERNS OF HIGH SCHOOL BASEBALL

COACHES AND ATHLETES

by

Ronald Bednar King

An Abstract

of a thesis submitted in partial fulfillment

of the requirements for the degree of

Master of Science in the School of

Health, Physical Education

and Recreation at

Ithaca College

December 1985

Thesis Advisor: Dr. Victor H. Mancini

ABSTRACT

This study was initiated in an attempt to assess if coach-athlete interaction patterns vary in different athletic environments. The subjects for this study were 18 high school baseball teams ($\underline{n}$ = 185 athletes; $\underline{n}$ = 18 coaches) from central and western New York state. Athlete responses on Form R and I of the Group Environment Scale (GES) were used to classify teams as either satisfied or less satisfied. Two 30-minute videotapes of each team were coded with Cheffer's Adaptation of the Flanders' Interaction Analysis System (CAFIAS). Results from MANOVA revealed a significant difference between the satisfied and less satisfied groups. When analyzed collectively by ANOVA, five CAFIAS parameters were found to be statistically significant. These parameters indicated that the satisfied group participated more in game-like activities, received more positive reinforcement, and was exposed to a more indirect coaching style. Several comparisons were made using coaches' and athletes' responses from Form R and I of the GES. MANOVA was used in all comparisons to determine if the difference between groups was significant. When Form R was compared for coaches and athletes, a significant difference was found. The coaches perceived the environment to be more favorable. When Form R and I were compared, areas in need of change were identified. Athletes indicated that the ideal environment would contain higher levels of leader control, order and organization, and innovation. Also, the level of anger and aggression would be lower than that

exhibited in the present environment. A similar comparison using coaches' perceptions of the real and ideal environment showed that coaches held a higher aspiration for the ideal environment. The findings of this investigation indicated that the satisfied environment contained more indirect coach-athlete interactions; student initiated behavior, coach suggested; and coach use of praise and acceptance. The less satisfied groups were characterized as having more extended information giving, athlete predictable behavior, coach suggested and coach use of criticism. It was further found that coaches and athletes did not have the same perception of their present or ideal environments. Coaches perceived their environments as being close to ideal and held higher aspirations for the ideal than their athletes.

ENVIRONMENTAL ANALYSIS AND INTERACTION

PATTERNS OF HIGH SCHOOL BASEBALL

COACHES AND ATHLETES

_____

A Thesis Presented to the Faculty of

the School of Health, Physical

Education, and Recreation

Ithaca College

_____

In Partial Fulfillment of the

Requirements for the Degree

Master of Science

_____

by

Ronald Bednar King

December 1985

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

CERTIFICATE OF APPROVAL

_____

MASTER OF SCIENCE THESIS

_____

This is to certify that the Master of Science Thesis of

Ronald Bednar King

submitted in partial fulfillment of the requirements
for the degree of Master of Science in the School of
Health, Physical Education, and Recreation at Ithaca
College has been approved.

Thesis Advisor:

Committee Member:

Candidate:

Chairman, Graduate
Programs in Physica
    Education:

Coordinator,
    Graduate Studies

Date: _Dec 30, 1985_____

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Chapter 1

INTRODUCTION

For many years coaches have relied on guidelines and
fundamentals that were based largely on experiential
foundations and traditional practices. With the increased
popularity and prestige of sports, championship coaches are
turning to educational research in hopes of finding the most
effective means to evaluate the athletic environment.
Recent studies have analyzed teaching in terms of social
climate and, since coaching has been analogized and equated
with teaching (Gaylord, 1967; Sabock, 1973), it would seem
logical to study the athletic environment in terms of social
climate.

Moos (1969) reported that social climates have unique
personalities which have direct effects upon those who
function within them. Rushall and Siedentop (1972) asserted
that when a favorable climate is established, it will
contribute to a team reaching specific goals with greater
expediency and satisfaction. Of the six major ways by which
human environments have been assessed, environmental
analysis through perceived social climate seems to be a
particularly promising field (Kiritz & Moos, 1974).

Moos and his associates have developed perceived climate
scales for each of nine types of environments (Moos, 1974).
Of these, the Group Environment Scale (GES) assesses social
climate as the sum of all interactions that take place
within a group (Moos, Insel, & Humphrey, 1974).

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The social climate, more commonly referred to as team climate in sports, is more likely to be influenced by coaches than athletes because of their predominant role in the determination of team policies and rules (Carron, 1980). It has also been demonstrated that team climate is a function of the coach's personality, the specific sport's setting, and coach support of both groups and individuals (Hendry, 1974: LaGrand, 1971; Percival, 1971).

Fisher, Mancini, Hirsch, Proulx, and Staurowsky (1982) argued that coaching behaviors should be explored in light of the interaction occurring between the coach and players as demonstrated in the environment in which the interactions occur. It, therefore, not only becomes logical to view the interactions in their natural environment but also with the focal point on the coach. This can be done through the use of an interaction analysis system.

Interaction analysis was developed to aid teachers in improving their role in the classroom through a better understanding of teacher-student relationships. Two of the most popular interaction analysis systems have been developed by Flanders (1970) and Cheffers (1972). The Flanders' Interaction Analysis System (FIAS) was created to code only verbal behaviors as they were exhibited by the teacher and students in the class. In a classroom setting it was accepted that verbal behavior was adequate to assess total behavior of the person. Cheffers (1972) argued that,

in a physical activity setting, there was a need to record and evaluate nonverbal behavior as well as verbal. Cheffers' Adaptation of Flanders' Interaction Analysis System (CAFIAS) was developed and has proven to be a useful tool for the analysis of teacher-student and coach-athlete interactions in physical activity settings (Avery, 1981; Rotsko, 1979; Savitz, 1982; Sciera, 1983; Stulmaker, 1981).

CAFIAS was used in conjunction with the GES by Fisher et al. (1982) to study the relationships between coach-athlete interaction patterns and social climates, with the latter being related to member satisfaction with their team climates. The results from this study in the sport of basketball indicated that specific aspects of the athletic environment, with regard to coach-athlete interaction patterns, demanded change. Hopefully, the analysis of coaching behaviors in satisfied and less satisfied baseball environments should give some additional direction towards developing a positive and more conducive environment for sport participation.

Scope of Problem

This study was initiated in an attempt to assess if coach-athlete interaction patterns vary in different athletic environments. The subjects for this study were 18 high school baseball teams (n = 185 athletes; n = 18 coaches) from central and western New York state. The subjects were visited twice during the spring baseball

season. Form R (real or actual) of the GES, which measures athletes' and coaches' perceptions of their team climate, was administered, and a 30-minute segment of a practice session was videotaped on the first visit. During the second visit, Form I (ideal) of the GES was given, and another 30-minute practice segment was videotaped. Form I of the GES measures the way in which coaches and athletes depict an ideal athletic environment.

The 18 teams were divided equally into two groups based on a median split of the absolute differences between mean scores R and I of the GES. The first group was classified as being satisfied and the second group as being less satisfied with their respective athletic environments. Coaches were administered the same GES forms as their athletes to ascertain how the coaches perceived the environment in comparison to their athletes. The 30-minute videotapes of practice sessions were coded using Cheffers' Adaptation of Flanders' Interaction Analysis System (CAFIAS). A multivariate analysis of variance was then performed on eight CAFIAS variables to assess whether differences in coaching behaviors existed between satisfied and less satisfied teams.

Statement of Problem

Coaches' and athletes' perceptions of their team climates were compared. Also, coach-athlete interaction patterns in satisfied and less satisfied baseball environments were compared using CAFIAS.

Major Hypotheses

The following hypotheses were developed for this study:

1. There will be a significant difference in coach-athlete interaction patterns, as measured by eight CAFIAS variables, in satisfied and less satisfied environments.

2. There will be a significant difference between the way the coaches and athletes perceive their actual environment.

3. There will be a significant difference between the way athletes perceive their actual environment in relation to an ideal environment.

4. There will be no significant difference between the way coaches perceive their actual environment in relation to an ideal environment.

5. There will be a significant difference between what athletes and coaches perceive as an ideal environment.

Assumptions of Study

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

1. Two 30-minute taping sessions provided an accurate measure of the coach-athlete interaction patterns.

2. GES data accurately characterized team climate.

3. The absolute differences between each of the 10 variables of Forms R and I of the GES accurately differentiated levels of satisfaction with the team environment.

Definition of Terms

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

1. <u>Anger and aggression</u> are the degree to which there is expression of negative feeling within a group (Moos et al., 1974).

2. <u>Cheffers' Adaptation of Flanders' Interaction Analysis System</u> (CAFIAS) is an interaction analysis system developed for use in physical activity settings to objectively describe both verbal and nonverbal teacher-pupil interaction, class structure, and a variety of classroom teaching agents (Cheffers, Amidon, & Rodgers, 1974).

3. <u>Coaches</u> are certified educators who coach athletics in voluntary instructional programs held after school hours where individuals compete for the privilege of participation.

4. <u>Coach-athlete interaction patterns</u> are those behaviors exhibited by coaches during coach-player interaction.

5. <u>Coder reliability</u> is the degree to which the person or persons doing the coding are consistent.

6. <u>Cohesion</u> is the degree of cooperation and involvement existing in a group and the league of friendship that members have for one another (Moos et al., 1974).

7. <u>Direct teaching behavior</u> is that behavior exhibited by the teacher who limits students' freedom in the classroom.

8. _Expressiveness_ is the ability with which members of the group fully show their feelings (Moos et al., 1974)

9. _Flanders' Interaction Analysis System_ (FIAS) is an observational system designed to assess in an objective manner verbal interaction between teachers and pupils as it occurs in the classroom environment (Amidon & Flanders, 1971).

10. _The Group Environment Scale (GES)_ is a scale designed to assess the social climate in a task-oriented group (Moos et al., 1974).

11. _High school level_ encompasses grades nine through 12.

12. _Independence_ is the degree of independent expression tolerated or encouraged in the group (Moos et al., 1974).

13. _Indirect teaching behavior_ is that behavior exhibited by the teacher who facilitates students' freedom in the classroom.

14. _Innovation_ is the degree of diversity that is encouraged in the group (Moos et al., 1974).

15. _Interaction analysis (IA)_ is an observational technique that measures the frequency of teacher-pupil interaction of behaviors (Amidon & Flanders, 1971).

16. _Leader control_ is the degree to which the leader directs and enforces the rules of the group (Moos et al., 1974).

17. <u>Leader support</u> is the amount of help, concern, and friendship displayed by the leader of the group (Moos et al., 1974).

18. <u>Nonverbal behavior</u> is that behavior exhibited by the teacher who facilitates students' freedom in the classroom.

19. <u>Order and organization</u> is the degree to which the group is structured (Moos et al., 1974).

20. <u>Self-discovery</u> is the ability of the group to discuss personal details (Moos et al., 1974).

21. <u>Social climate</u> is one of the major ways in which human environments may be characterized (Moos et al., 1974).

22. <u>Task orientation</u> is the degree of emphasis on concrete tasks (Moos et al., 1974).

23. <u>Team sports</u> are sports in which performance outcomes are dependent upon the total group's performance.

24. <u>Verbal behavior</u> is behavior expressed in an audible, observable fashion.

<u>Delimitations of Study</u>

The following were the delimitations of the study:

1. Male varsity baseball athletes ($\underline{n}$ = 185) and coaches ($\underline{n}$ = 18) from 18 rural high schools in central and western New York state were the only subjects involved in this study.

2. CAFIAS was the only interaction analysis system used to measure coach-athlete interaction patterns.

3. The GES was the only instrument used to assess the social climate.

4. Each subject in each environment was observed only twice.

Limitations of Study

The following were the limitations of the study:

1. The results may not hold true if the study was to be conducted outside varsity baseball athletes and coaches from rural high schools in central and western New York state.

2. The resultant information pertaining to coach-athlete interactions may only be valid when CAFIAS is the measurement tool.

3. Team climate results may only be valid when the Group Environment Scale is the measurement tool.

4. The results of this study may only be valid when two 30-minute observations are used to measure coach-athlete patterns.

Chapter 2

REVIEW OF RELATED LITERATURE

The review of related literature in this chapter will
deal with the following topics: team climate, analysis of
the coach and team climate, descriptive-analytic research in
sport, and summary.

Team Climate

Whenever a group of people assemble for a common
purpose, they create a social climate, or in sports a
teamclimate. These social climates, like people, have
unique personalities and, because the psychosocial
environment is comprised of interactions among group
members, the social climate created may be unique to that
group and environment (Kiritz & Moos, 1974).

The measurement of the environment in psychology has
been a relatively recent development. Measurement of the
perceived environment for the systematic investigation of
the general norms, values, and other characteristics seems
promising because of the belief that social environments
have important effects on psychological processes. Social
stimuli associated with the relationship dimensions of
support, cohesion, and affiliation generally have positive
effects towards enhancing normal development but, because
the effects may differ from person to person, it is
difficult to make conclusions about specific types of
effects. Kiritz and Moos (1974) concluded that the

measurement of the social climate, as perceived by its members, might enable us to make environments healthier in general or to improve the person-environment fit for specific groups of individuals.

People have different personal agendas which impel their behaviors in specific directions. When these plans interact with an environment programmed to organize the shape and behavior of its inhabitants, it is easy to see that all people will not be affected in the same way. Because of the differences in aspirations and goals among members associated with an environment, it would be impossible to establish well-defined criteria for an ideal environment. But even though an ideal environment cannot be described, organizations and institutions do arrange social environments that they hope will promote desirable behaviors and discourage undesirable ones (Moos, 1976).

Social climates can be described with a great deal of accuracy and detail. Moos (1976) reported that vastly different social environments can be described by common or similar sets of dimensions which have been divided into the broad categories of relationship, personal development, and system maintenance and system change. Although the categories are similar across many environments, vastly different settings may cause unique variations within the general categories. The relationship dimension identifies the nature and intensity of personal relationships with

regards to involvement, support, help, spontaneity, and free and open expression between group members. The assessment of personal growth and self-enhancement come under the category of personal development, which may vary among different environments depending on the specific purpose or goals.

The system maintenance and system change dimension evaluates orderliness, clarity of expectations, degree of control, and responsiveness to change. The ability of the researcher to identify similar underlying dimensions along which different social environments can be characterized is quite important, according to Moos (1976), because it may eventually help us determine why an individual does very well in one environment and quite poorly in another.

Withall (1949) developed a technique to assess the social-emotional climate in the classroom by analysis and categorization of statements made by the teacher. He concluded that social climate can be assessed and described in terms of teachers' verbal statements and, although social climate is a group phenomenon, the teacher is the single most important individual in determining the social climate for the group.

White and Lippitt (1968) studied the differences in the behaviors of groups of boys under three different types of leadership. They found that under various forms of leadership, even though the activities and settings were the

same, differences did exist in terms of quantity and quality of work, motivation, originality, hostility, demands for attention, destruction of own property, and scapegoat behavior. From this study they concluded that leadership styles produce different social climates, which result in varied group and individual behavior.

Furthermore, Kiritz and Moos (1974) observed that there were six major ways by which human environments have been assessed or characterized: analysis of ecology, behavioral settings, organizational structure, personal and behavioral characteristics of the individual member of a particular environment, functional analysis of environments in terms of social reinforcement contingencies, and psychosocial characteristics and organizational climate. Of these methods, the study of psychosocial characteristics and organizational climate, which include perceived social climate, seems to be a particularly promising field of study. Moos and his associates have developed perceived social climate scales for each of nine types of environments. Each of these scales discriminates among environmental units, shows good profile stability, and has been or is in the process of being standardized (Moos, 1974).

Of these, the Group Environment Scale (GES) measures the social-environmental characteristics of task-oriented, social, psychotherapy, and mental support groups (Moos et

al., 1974). There are three forms of the GES: Real (R), which measures people's perception of the actual group setting; Ideal (I), which measures people's perception of ideal group settings; and Expectations (E), which measures people's expectations about new group settings. These underlying domains, or set of dimensions, are assessed by the 10 GES subscales.

The cohesion, leader support, and expressiveness subscales are used to measure the relationship dimension. This measures members' involvement in and committment to the group, concern, and friendship; and help for both leader and other members; and the extent to which freedom of action and expression of feelings are encouraged.

The personal growth dimension is measured by the independence, task orientation, self-discovery, and anger and aggression sub-scales. These subscales assess how much the group encourages independent action and expression, degree of emphasis on practical tasks, decision making, discussion of personal information, and the degree to which expression of negative feelings and intermember disagreement will be tolerated.

The system maintenance and system change dimension is measured by the subscales order and organization, leader control, and innovation. These subscales assess the degree of formality, structure, explicitness to rules and sanctions, decision making, rule enforcement, and diversity and change as facilitated by the group.

When different combinations of forms are employed, the GES can be used to describe or compare social environments of group settings, compare member and leader perceptions, compare actual and preferred group milieus, and assess and facilitate change in group social environments (Moos et al., 1974).

Analysis of the Coach and Team Climate

In sports as in any other task-oriented group, there exists a social climate intended to achieve group goals. Research has demonstrated that groups with similar goals and settings have a variety of different social climates as well as levels of team performance and member satisfaction with the sport experience.

Research into the analysis of the athletic environment has focused on the coach. His/her personality, behavioral patterns, interpersonal relationships, and coach-athlete interactions, as perceived by the coach himself/herself, by the athletes or team members, and by outside observers, have been closely scrutinized. This method seems to be appropriate since the leader of a group is very often responsible for the climate of the group and consequently is a determining factor in its productivity (White & Lippitt, 1968).

In the power system perspective of leadership, Carron (1980) argued that coaches, not athletes, have the greater potential for exerting influence because they play the

predominant role in the determination of team climate. The resultant climate is a determining factor in the productivity of the group.

Carron and Bennett (1977) employed the use of coach-athlete dyad to study coach-athlete interpersonal relationships. Only athletes who were identified by their coach as being extremely compatible or extremely incompatible were selected for this study. Although affection and control behaviors were found to be of some importance, the most critical factor in determining the difference between compatible and incompatible coach-athlete dyads was the athletes' need for inclusion behavior. A positive relationship was categorized by association, interaction, mingling, and communication.

Rushall and Smith (1979) employed behavioral analysis with a self-recording technique to change the repertoire, quality, and quantity of several behavioral categories in a coach. They used the Coach Observation Schedule (COS) to describe the classes of behavior that occur in the performance of coaching. The results showed a small decline in questioning; a marked decrease in directing, explaining, and information giving; and a considerable increase in monitoring, attention to feedback, and reward behaviors by the coach.

Hendry (1974) claimed that team climate is a function of the coach's personality and the specific sports setting.

College physical education teachers and coaches completed the Dynamic Personality Inventory to provide a general picture of their personality organization. A close similarity was found between coaches and teachers for the personality traits enjoyment of admiration, organizational abilities, and high authoritarianism. Team sport and combat sport coaches consistently showed similar personality traits. For the coaches of other sports, the more individualized the sport, the greater the psychological difference between coaches, and the further they were removed from the group of team and combat sport coaches. The physical education teachers showed a consistency of total personality different from both groups of coaches. Thus, Hendry (1974) concluded that the physical education teachers' more overt sociability makes them better suited to large group situations, while the coaches' control, calmness, ability to hide emotion, and organizational abilities make them more suited to small, highly competitive groups. Hendry further suggested that there exists a "matching" between personality and social settings with regards to sports.

LaGrand (1971) reported results in agreement with Hendry (1974), in stating that each sport has its own specific individuality and behaviors. The Semantic Differential Scale was filled out by athletes and used to evaluate the coach's personality from the players' point of

view. The study revealed the presence of significant differences in the characteristics of coaches of different sports. Basketball players and wrestlers rated their coaches higher in methods of teaching and use of discipline than did soccer or tennis players. Wrestlers perceived their coaches' ability to inspire higher than athletes of any other sport.

In sports settings where athletes perform as individuals, they require more and better support from their coach than do team sport performers (Percival, 1971). These individual performers are also more likely to be critical of the coach's efforts than members of a group who interact with each other in a competitive situation. Percival further claimed that a discrepancy exists between the level of competency that coaches hold for themselves and the images they project to their athletes.

Descriptive-analytic Research in Sport

The use of descriptive-analytic techniques is one of the more recent developments in the analysis of the athletic environment. Descriptive-analytic techniques or interaction analysis utilize a coding system to categorize behaviors. Because the order in which behaviors are exhibited in social settings is important these codes are listed in order of occurrence. The patterns of codes define or describe what has taken place. Many different interaction analysis systems exist, with different combinations of categories, each designed with specific purposes in mind.

One interaction analysis system that has been popular
for analysis of teacher behavior in the classroom is
Flanders' Interaction Analysis System (FIAS). FIAS was
created to code verbal behaviors because Flanders (1970)
felt that they can be observed with higher reliability than
can nonverbal behaviors, and verbal behaviors were assumed
to be an adequate sample of the total behavior of a person
(Amidon & Flanders, 1971). Because FIAS makes no provisions
for nonverbal behavior, Kurth (1969) and Bahneman (1972),
who used FIAS to study the physical education setting,
reported that its use was limited.

Cheffers (1972) designed the most extensive and refined
adaptation of FIAS for use in physical education settings.
Cheffers' Adaptation of Flanders' Interaction Analysis
System (CAFIAS) was constructed to describe classroom
behaviors in terms of verbal and nonverbal dimensions as
well as to identify teaching agents and the structure of the
activity session. Because of its ability to include
nonverbal behaviors, CAFIAS has proven to be a popular tool
in the analysis of the sports environment.

One of the more recent applications of CAFIAS in the
study of the sports environment is to divide the subjects
into subgroups based on the variable being investigated.
The coach-athlete interactions are coded with CAFIAS and
used to make between group comparisons. Savitz (1982) did
such a study by subdividing the coaches of women's
basketball teams by sex.

Coaching behaviors of male and female coaches of women's basketball teams were analyzed and compared by Savitz (1982). Videotapes of the 15 male and female coaches were coded using CAFIAS. The results were subjected to multivariate analysis of variance (MANOVA) and then analysis of variance (ANOVA) to determine each variable's contribution to the between-groups difference. It was determined that significant differences did exist in coaching behaviors between male and female coaches. These behaviors listed in order of significance were coach use of acceptance and praise, verbal; athlete nonverbal initiation, coach suggested; and athlete nonverbal initiation, athlete suggested.

Six of the CAFIAS variables, when considered independently by univariate analysis of variance, indicated significant differences between the two groups. These six variables were coach use of acceptance and praise, verbal; coach use of acceptance and praise, nonverbal; athlete verbal initiation, coach suggested; athlete nonverbal initiation, coach suggested; athlete verbal initiation, athlete suggested; and athlete nonverbal initiation, athlete suggested.

The dominant behavior exhibited by male coaches was extended information-giving; by female coaches the dominant behavior was extended interpretive drills. The category of athlete interpretive response followed by coach use of

praise was found only in the female coaching group. These results are consistent with earlier results with female coaches tending to show more indirect behaviors such as the use of acceptance and praise; whereas male coaches show more direct behaviors such as lecture and demonstration.

Stulmaker (1981) also studied coaching behaviors of male and female basketball coaches. Using 50 male coaches and 50 female coaches as subjects, he subjected two 30-minute videotapes from each coach to CAFIAS coding. He analyzed 20 CAFIAS variables and 23 CAFIAS parameters by both MANOVA and ANOVA. No significant differences existed between male and female coaches at the .05 level of statistical significance. However, looking at trends, female coaches used more nonverbal teacher response; whereas male coaches used more verbal criticism. Athletes of female coaches displayed more nonverbal predictable responses, while athletes of male coaches displayed more nonverbal interpretive responses

Using Dyadic Adaptation of CAFIAS (DAC), Boyes (1981) compared the behavior of six NCAA Division III college football coaches as they interacted with athletes of different athletic abilities. Each coach identified the players who would and would not start in the upcoming game at the beginning of the week. Videotapes, 20 minutes in length, were then taken of each coach during the week and were coded with DAC. Visual analysis revealed minimal

difference between the interaction behaviors of coaches with their starting and non-starting athletes. Coaches praised their starting athletes and accepted their ideas and actions more readily than their non-starting athletes, to whom they gave more directions. The starting athletes were characterized by interpretive, self-initiated behaviors; whereas the non-starting athletes' behaviors were predominantly predictable in nature.

The behavior of coaches as they interacted with players during different phases of the sports season was the focus of a study by Sciera (1983). The season was categorized into pre-season, after wins, and after losses with six 15-minute videotapes taken during each phase. The videotapes were coded by CAFIAS, and the raw data from the six NCAA Division II football coaches were subjected to computer analysis. Significant differences did exist between various phases of the football season. During the pre-season, coaches exhibited a more indirect style of coaching using more acceptance and praise of athletic responses and giving more information, and the athletes' behaviors were predictable mechanical responses.

After wins the coaches used less acceptance and praise of player responses than during the other two phases. The behavior of athletes was more often interpretive than predictable indicating that more scrimmage took place at this time. After losses coaches' behaviors were

characterized by less information giving and more directions and criticism with athletes' behavior evenly distributed between predictable and interpretive responses.

A study undertaken by Rotsko (1979) compared the coaching behavior of successful and less successful male coaches. Videotapes of high school varsity coaches were viewed by a panel of eight judges who rated the subject on coaching effectiveness using the Coaches' Performance Criteria Questionnaire (CPCQ). Coaches were divided into two groups by median split technique, those successful and those less successful, according to the CPCQ scores. All videotaped practice sessions were coded with CAFIAS in order to analyze coaching behaviors. The Kruskal-Wallis one-way analysis of variance identified three of the 26 CAFIAS variables and three of the CAFIAS parameters in which the two groups were significantly different. The successful coaches gave more verbal and nonverbal praise, while the less successful coaches used more verbal criticism.

In general it was found that the successful coaches were more indirect in their teaching and coaching methods. The less successful coaches were more direct in their coaching behavior, using more verbal and nonverbal information giving, more verbal and nonverbal direction giving, and more verbal and nonverbal criticism.

Using CAFIAS, Avery (1978) compared the behaviors of secondary school coaches. A panel of four experienced

teachers scored the coaches according to the Coaches'
Performance Criteria Questionnaire (CPCQ).   The median
split technique was used to classify coaches as effective
and less effective. Videotapes were taken of each coach and
coded with CAFIAS and subjected to computer analysis.   A
multivariate analysis of variance showed a significant
difference between the two groups of coaches.

Of the five CAFIAS variables that were significant,
teacher verbal acceptance and praise followed by pupil
verbal initiation accounted for 85% of the between group
difference. The other three categories found to be
significant were teacher use of acceptance and praise,
nonverbal; pupil nonverbal initiation, teacher suggested;
and pupil nonverbal initiation, student suggested. Pupil
nonverbal initiation, student suggested favored less
effective coaches while the other four categories favored
the effective coaches.

Fisher et al. (1982) employed the use of CAFIAS and a
separate social climate scale, the GES, to study coach-
athlete interactions in two different athletic environments.
The absolute differences between Form R and I of the GES
were used to group teams as satisfied or less satisfied with
their environments. These differences for each team and its
respective coach were scored to identify areas in which it
was perceived change was needed. Finally, the comparison of
Form R coach to Form R athlete was used to assess the
differences in perception of the actual environment.

Results showed that, although all behavioral patterns occurred in both satisfied and less satisfied environments, the quantity of these occurrences varied greatly among the satisfied and less satisfied teams. Athletes from satisfied teams received more verbal and nonverbal coach praise and acceptance, responded with more verbal and nonverbal initiative in following coach's instructions, and were exposed to more coach verbal and nonverbal questioning. Athletes from less satisfied teams received more extended information giving, directions, and verbal and nonverbal criticism. Behaviors were characterized for satisfied teams as broader interpretive responses and initiated behavior as well as more athlete-to-athlete verbal interaction. Less satisfied teams were higher in verbal and nonverbal dependence on the coach, silence, and athlete-to-athlete nonverbal interaction.

In general the GES showed that teams who were more satisfied were more cohesive, more task oriented, more innovative, and received more leader support. Athletes reported significant discrepancies between their assessment of real and ideal team climates in all GES subscales except leader control, with innovation, anger and aggression, and expressiveness accounting for 65% of the between group difference. Essentially, the coaches showed no difference in what they perceived to be their real team climate and the ideal team climate.

In the assessment of actual team environments (R),
coaches perceived that they provided more leader support,
allowed more independence, emphasized more practical
training, tolerated more personal details, were more
explicit about team regulations, and exerted more leader
control than their athletes perceived. The categories of
leader support, self-discovery, and cohesion accounted for
67% of the coach-athlete group difference.

There were significant overall group differences
between coaches' and athletes' perception of the ideal team
environment. The categories of innovation, self-discovery,
cohesion, and order and organization accounted for 72% of
the ideal group variance between coach and athlete. Fisher
et al. (1982) concluded that change is needed in order to
improve the quality of the athletic environment and
subsequently the athletic experience. They argued that
coaching behaviors should be explored in light of the
interaction occurring between the coach and players as
demonstrated in the environment in which the interactions
occur.

Summary

Social climates can be portrayed with a great deal of
accuracy and detail by common or similar sets of dimensions
(Moos, 1976). Social climates vary among groups due to
differences in aspirations, goals, and personal agendas of
the members. This makes it difficult to describe a well-

defined ideal environment. Kiritz and Moos (1974) do
believe that the measurement of perceived social climates
might enable us to make environments healthier in general
and improve person-environment fit for specific groups of
individuals.

Moos et al. (1974) developed the Group Environment
Scale in order to measure social climate of groups. The
scale consists of three forms designed to measure the real,
ideal, and expected environments, as reported by group
members.

In hopes of gaining a better understanding of the
athletic environment, researchers have employed several
different methods. One of the more popular methods is to
use coaches as the focal point and study their interaction
with the rest of the team. Hendry (1974) and Rushall and
Smith (1979) used self-recorded data provided by the coach
while LaGrand (1971) gathered information from the team
members. Carron and Bennett (1977) employed a coach-athlete
dyad based on information from both the coach and athletes.

The development of descriptive-analytic techniques or
interaction analysis is a recent development in the
evaluation of the athletic environment. CAFIAS is an
interaction analysis system which has been widely used in
sports research because it incorporates both verbal and
nonverbal behaviors. Studies using CAFIAS done by Avery
(1978), Rotsko (1979), Savitz (1982), Sciera (1983), and

Stulmaker (1981) have provided information concerning the role of verbal and nonverbal behavior in the sports environment. DAC and the adaptation of CAFIAS was used by Boyes (1981) to compare coaches' behavior as they interacted with athletes of different athletic abilities. Fisher et al. (1982) used the Group Environment Scale and CAFIAS to contrast the behaviors of coaches in two distinctly different environments. The GES was used to classify teams as being satisfied and less satisfied with their environments. CAFIAS was then used to identify behaviors that existed within each group. Results showed that although all behavioral patterns occurred in both environments the quantity of these occurrences varied greatly among the satisfied and less satisfied groups.

Chapter 3

METHODS AND PROCEDURES

Methods and procedures used in this study with regard
to selection of subjects, testing procedures, testing
instruments, scoring of data, coder reliability, treatment
of data, and summary are outlined in this chapter.

Selection of Subjects

High school varsity baseball teams from 18 rural
schools in central and western New York State served as
subjects. Athletes (n = 185) and coaches (n = 18) were
given an explanation of the details and subject demands of
the study. It was stressed that all information would
remain confidential and that the subjects could withdraw
from the study at any time. All subjects gave their
informed consent.

Testing Procedures

Two visits were made to each school in the latter part
of the baseball season. During the first visit, players and
coaches signed the informed consent forms (Appendix A).
Thirty minutes of practice were then videotaped and, at the
conclusion of the practice, Form R of the GES was given to
those who volunteered to be part of the study. The second
visit consisted of a second 30-minute taping session. Form
I of the GES was administered to those subjects who
previously completed Form R, again at the conclusion of the

practice. Both forms R and I of the GES were completed by
all coaches. This was also done at the conclusion of
practice.

Testing Instruments

The Group Environment Scale (GES), developed by Moos et
al. (1974), was used to evaluate athletes' and coaches'
perceptions of their team settings. The GES, a 90-item
questionnaire, encompasses the variables of cohesion, leader
support, expressiveness, independence, task orientation,
self-discovery, anger and aggression, order and
organization, leader control, and innovation to classify the
environment. Two forms of the GES, real (R) and ideal (I),
were administered to all subjects. Form R measures the
actual climate that existed within the team as perceived by
the coach and athletes. Form I depicts the environment that
would be perceived as ideal for that particular social
setting.

Moos (1981) reported the internal consistencies
(Cronbach's alpha) for each of the 10 GES subscales to be
within the acceptable range. The independence category
scored the lowest at .62 with cohesion scoring the highest
at .86. There were four subscales in the .70 - .74 range,
three in the .83 - .85 range, with innovation scoring .78.
Subscale intercorrelations indicated that the subscales
measured distinct though somewhat related aspects of the
group social environment. These intercorrelations, however,

account for an average of less than 10% of the subscale
variance.

The test/retest reliability for a 1-month interval fell
within the acceptable range varying from independence (r =
.65) to anger and aggression (r = .87).

A stability coefficient was calculated by correlating
the means obtained at one testing to those obtained at a
subsequent testing for that same group. Test scores for 4-,
8-, 12-, and 24-month intervals showed a mean profile
stability of .92, .91, .84, and .78, respectively. Although
these reflect slight changes within the group setting over
time, they indicate that the GES profiles are quite stable.

Cheffers' Adaptation of Flander's Interaction Analysis
System (CAFIAS) was used to code the coach-athlete
interaction patterns on the videotapes. CAFIAS employs 10
categorized behaviors which can be classified as verbal,
nonverbal, and simultaneously occurring verbal-nonverbal.
The classifications also denote coach- or athlete-initiated
behaviors. Whenever there is a behavioral change or for
every 3-second period, one of the 20 CAFIAS variables is
recorded. From this coded information, 26 CAFIAS parameters
can be computed as well as the sequence in which the
behaviors occurred.

Scoring of Data

Forms R and I of the GES were scored with a transparent
overlay, which resulted in raw scores for each of the 10

subscales. Athletes' scores were added to give a team total for each of the 10 subscales, with Forms R and I being kept separate. Each team total was then divided by the number of athletes to provide a mean score per subscale. The absolute difference for each subscale between Forms R and I was totaled for each team to give a cumulative team total.

Teams were then placed in order from the smallest to the largest cumulative total, and the median split technique was used to divide the teams into two groups. Since a smaller total denotes more congruence between existing and ideal environments, the group with the nine smallest totals was classified as satisfied, while the group with the nine largest totals was classified as less satisfied.

Coder Reliability

A trained expert coded the CAFIAS data. Four randomly selected practice sessions, two from each group, were coded twice, each at separate times. The two codings of the same tapes were them subjected to Spearman rank-order correlation to determine coder reliability.

Treatment of Data

Several comparisons were made using coaches' and athletes' responses from form R and I of the GES. These comparisons, coaches' R vs athletes' R, athletes R vs I, coaches' R vs I, and coaches I vs athletes' I, were treated to a multivariate analysis of variance to determine overall differences between groups. If necessary, follow-up

analysis using analysis of variance and discriminant function analysis were conducted. Those variables that contributed independently were identified with ANOVA, while shared variance among variables was tested by discriminant function analysis (Spector, 1977).

A multivariate analysis of variance was performed on eight variables of CAFIAS to assess whether differences in coach-athlete interaction patterns existed between the satisfied and less satisfied teams. If necessary, ANOVA then located which of the eight CAFIAS variables contributed independently to the differences between the two groups. In testing the CAFIAS variables, discriminant function analysis identified those variables accounting for the difference in a shared sense.

The .05 level of significance was used to test all hypothesis.

Summary

Athletes and coaches from 18 high school varsity baseball teams served as subjects in this study of coaching behaviors in two different athletic environments. Two visits were made to each team practice for the purpose of videotaping and administering Form R and I of the GES.

The GES information was tabulated into raw scores that were converted to mean scores for each team. The absolute differences for each subscale between Forms R and I were totaled to give a cumlative team total. The median split

technique was then used to classify teams into either a satisfied or less satisfied group.

Multivariate analysis of variance was applied to the GES data to asess overall group differences between coaches' R vs athletes' R, athletes' R vs I, coaches' R vs I, and coaches' I vs athletes' I. Significant differences were treated to analysis of variance and discriminant function analysis.

Multivariate analysis of variance was used to assess an overall difference for eight CAFIAS variables between the satisfied and less satisfied groups. Variables that contributed independently to the between group difference were identified with analysis of variance, while discriminant function analysis identified those accounting for the difference in a shared sense.

Chapter 4

ANALYSIS OF DATA

This chapter presents the results of the comparison of
the coach-athlete interactions in satisfied and less
satisfied environments. In addition, the perceptions of
team climate for various comparisons between coaches and
athletes are reported.

Coder Reliability of CAFIAS

In order to assess the reliability of the coder for
this investigation, four videotapes, two from the satisfied
group and two from the less satisfied group, were randomly
selected. Each tape was coded twice during two independent
observation periods. A Spearman rank-order correlation for
the two independent observations was assessed by comparing
the top 10 cell concentrations. The mean score of the
correlation was .964, which was sufficient to indicate coder
reliability.

Coach-athlete Interactions in Satisfied
vs Less Satisfied Environments

The means and standard deviations for the eight CAFIAS
variables are shown for both the satisfied and the less
satisfied groups in Table 1. A multivariate analysis of
variance (MANOVA) was performed on eight CAFIAS variables.
These results were used as a basis for analyzing coaching
behaviors between satisfied and less satisfied groups. Some
apparent differences were revealed. MANOVA revealed an

Table 1

Descriptive Statistics of Eight CAFIAS Variables in
Satisfied and Less Satisfied Environments

Variables	Satisfied		Less Satisfied	
	M	SD	M	SD
Coach Use of Questioning, Verbal	8.40	2.30	3.01	1.30
Coach Use of Questioning, Nonverbal	13.79	13.92	27.19	29.48
Coach Use of Acceptance and Praise, Verbal	52.26	6.36	12.61	4.83
Coach Use of Acceptance and Praise, Nonverbal	49.54	13.03	23.87	11.68
Athlete Verbal Initiation, Coach Suggested	91.36	3.09	51.28	15.69
Athlete Nonverbal Initiation, Coach Suggested	91.36	3.09	51.28	15.69
Athlete Verbal Initiation, Athlete Suggested	1.48	.66	6.54	8.77
Athlete Nonverbal Initiation, Athlete Suggested	1.19	.65	1.58	1.03

overall group difference, Hotelling's T^2 = 56.97 which is interpreted as F (8,9) = 64.09, p < .001. This led to the acceptance of the hypothesis that there will be a significant difference in coach-athlete interaction patterns, as measured by eight CAFIAS variables in satisfied and less satisfied environments.

When analyzed collectively by analysis of variance (ANOVA), four CAFIAS parameters were found to be statistically significant beyond .001 with one significant beyond .005 (Table 2). Behaviors in the satisfied group exhibited more coach use of questioning, verbal; coach use of acceptance and praise, verbal; coach use of acceptance and praise, nonverbal; athlete nonverbal initiation, coach suggested; and athlete verbal initiation, coach suggested than did the athletes in the less satisfied group.

Discriminant function analysis revealed the order of importance for each of the CAFIAS parameters, relative to explaining the overall group difference. The top three CAFIAS parameters in order of contribution were athlete nonverbal initiation, coach suggested; coach use of acceptance and praise, verbal; and coach use of questioning, nonverbal.

The top eight ranked CAFIAS interaction patterns and their percentages of occurrence for the satisfied and the less satisfied groups appear in Table 3. The use of a

Table 2

Analysis of Variance for Eight CAFIAS Variables Between
Satisfied and Less Satisfied Environments

Variable	SS	MS	F
Coach Use of Questioning, Verbal	56.07	3.50	37.37**
Coach Use of Questioning, Nonverbal	8504.75	531.55	1.52
Coach Use of Acceptance and Praise, Verbal	510.13	31.88	221.83**
Coach Use of Acceptance and Praise, Nonverbal	2450.06	153.13	19.37**
Athlete Verbal Initiation, Coach Suggested	2444.26	152.77	14.09*
Athlete Nonverbal Initiation, Coach Suggested	2046.59	127.91	56.50**
Athlete Verbal Initiation, Athlete Suggested	619.25	38.70	2.98
Athlete Nonverbal Initiation, Athlete Suggested	11.92	.74	.92

*p < .005.
**p < .001.

Table 3

Summary of the Most Frequent Interaction Patterns and
Percentage of Occurrence among the Male Baseball
Coaches for the Satisfied and
Less Satisfied Groups

Satisfied		Less Satisfied	
Interaction Patterns	Percent of Occurrence	Interaction Patterns	Percent of Occurrence
8\-10-8\	29.10	8\-10-8\	22.62
5-8\-5	16.58	5-6-8	18.98
6-8\-6	13.10	6-8\-6	12.18
5-6-8	8.76	8-10-8	12.10
8\-2-8\	8.37	5-5	10.90
2-5	4.25	5-8\-5	5.99
5-5	3.56	5-8-5	4.12
8\-3-8\	3.09	8\-7	2.27

Note. A description of the interaction patterns may
be found in Appendix B.

matrix permits the determination of patterns of interaction, which in turn permits objective descriptions of the patterns of interaction in each group.

The same five patterns appeared in both the satisfied and less satisfied groups, however, their percentages of occurrence were different for each group. Athlete-to-athlete interpretive interactions were the most predominant pattern in both groups occurring 29.10% of the time in the satisfied group and 22.62% of the time in the less satisfied group. Coach information giving, followed by coach direction, which was followed by athlete predictable response occurred 8.76% of the time in the satisfied group compared to 18.98% in the less satisfied group. Coach direction, followed by athlete interpretive response, which was followed by further coach direction occurred 13.10% of the time in the satisfied group and 12.18% in the less satisfied group. Extended information giving by the coach occurred only 3.5% of the time in the satisfied group compared to 10.90% in the less satisfied. The last common pattern, coach information giving, followed by athlete interpretive response, which was followed by further coach information or instruction occurred 16.58% of the time in the satisfied group and only 5.99% in the less satisfied group. The interaction patterns and percentages which were unique to the satisfied group were as follows: athlete interpretive response, followed by coach praise and

encouragement, which was followed by more athlete interpretive response, 8.37%; coach praise, followed by coach reinstruction, 4.25%; and athlete interpretive response, followed by coach acceptance, 3.09%. The patterns that occurred only in the less satisfied group were athlete-to-athlete predictable, 12.10%; coach information giving, followed by athlete predictable response, which was followed by further coach information giving, 4.12%; and athlete interpretive response, followed by coach criticism, 2.27%.

The mean percentage of CAFIAS behaviors between the satisfied and less satisfied groups was also compared (Figure 1). These percentages are based on 19,019 behaviors in the satisfied group and on 17,600 behaviors in the less satisfied group. The predominant behaviors for the satisfied group were predictable athlete interpretive response, coach suggested; information giving; silence and athlete-to-athlete interaction; and coach use of acceptance and praise. The less satisfied group was characterized by greater mean percentages of information giving; silence and athlete-to-athlete interaction; coach direction giving; and athlete predictable response, coach suggested.

Coaches' and Athletes' Perception of Team Climate

Several comparisons were made using coaches' and athletes' responses from Form R and I of the GES. These comparisons, which gave further insight into how athletes'
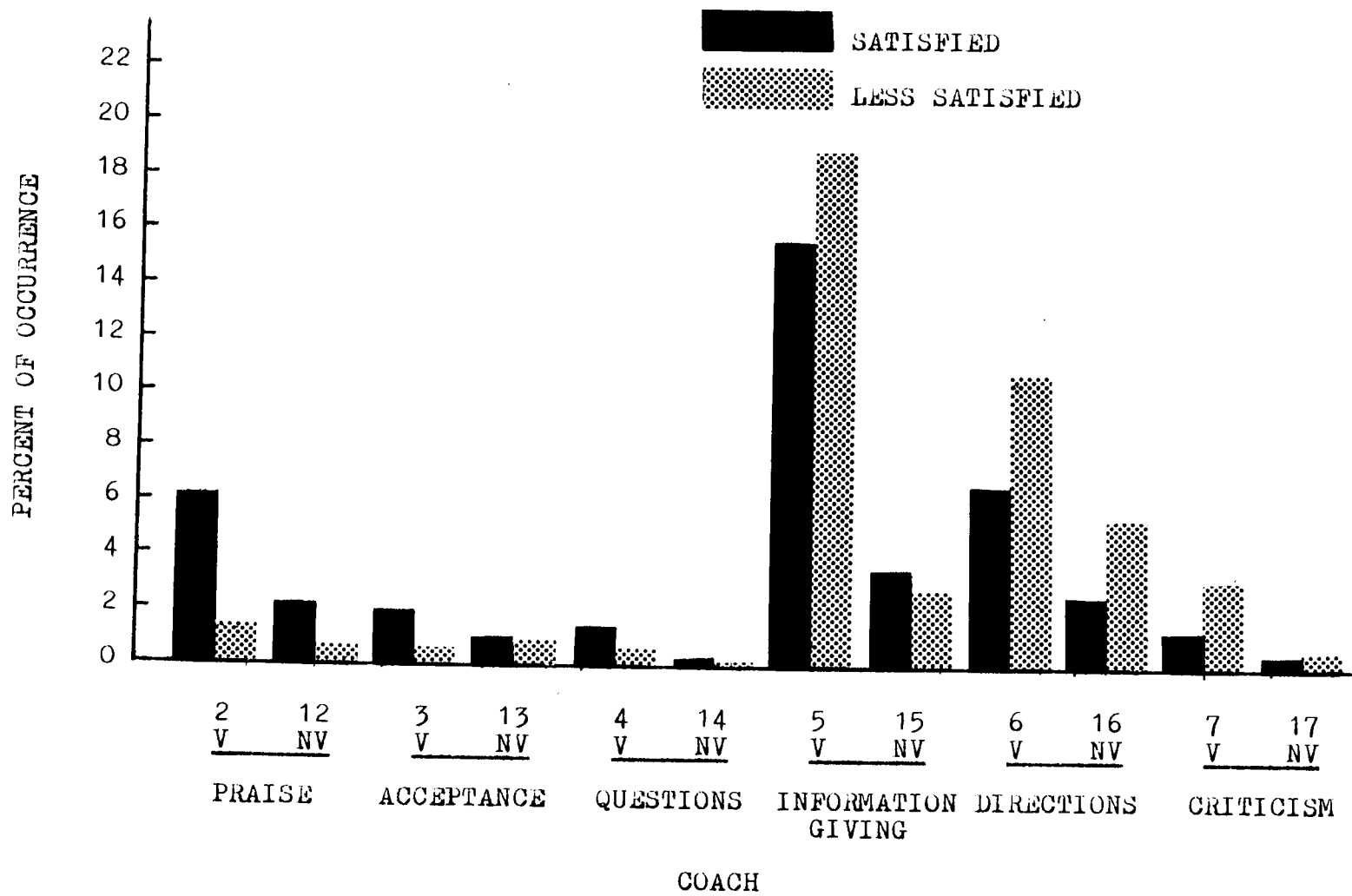
Figure 1. Mean percentages for the CAFIAS variables.
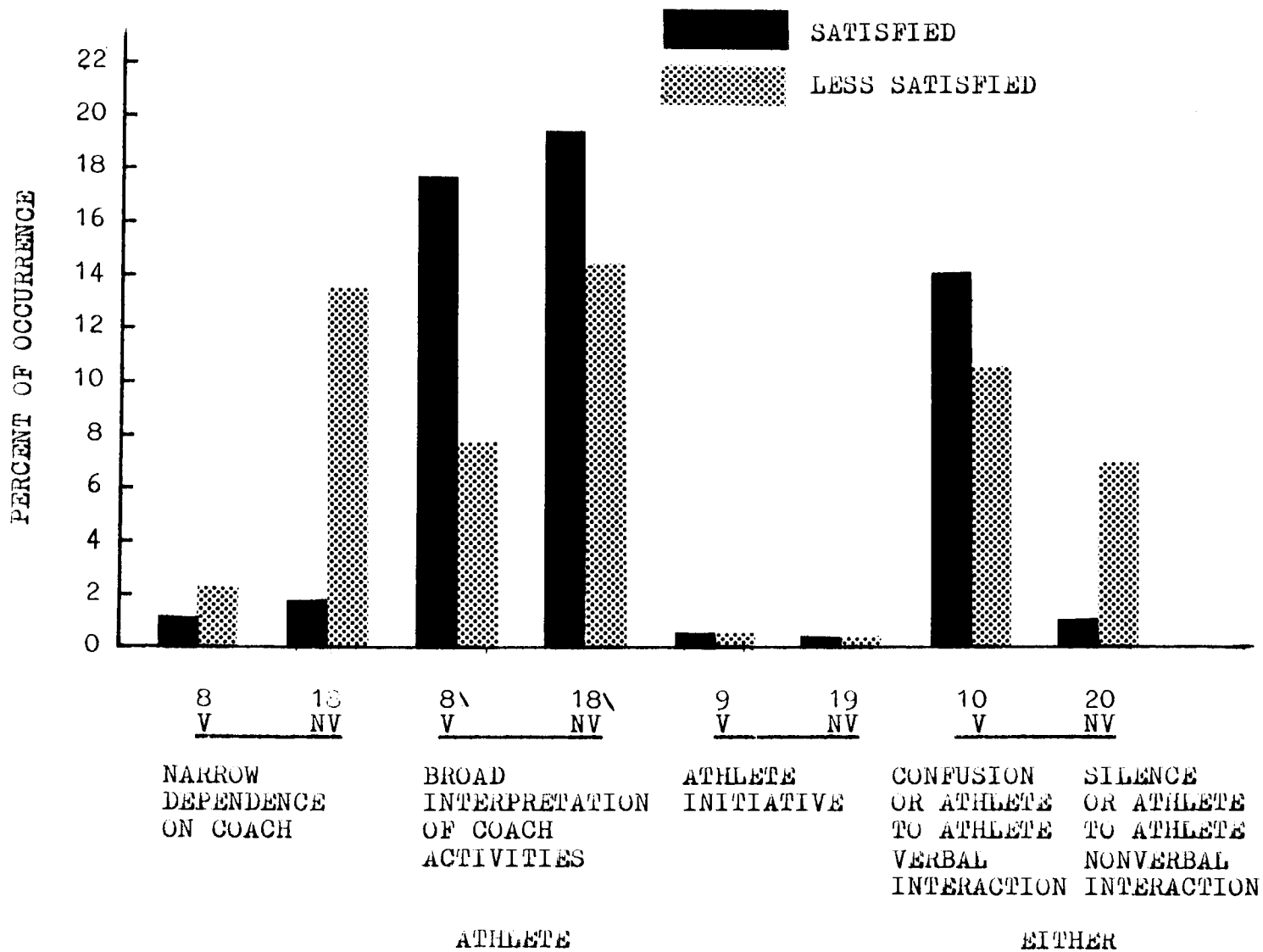
Figure 1. (continued)

and coaches' perceptions of team climates differed were coaches' R vs athletes' R, athletes' R vs I, coaches' R vs I, and coaches' I vs athletes' I.

Coaches' vs Athletes' Real Environment

The means and standard deviations for the 10 GES variables are reported in Table 4. There appears to be a pattern whereby coaches' perceptions are more favorable than athletes' perceptions. MANOVA revealed an overall difference between coaches' and athletes' perception of their environment, Hotelling's $\underline{T}^2$ = .15 which is interpreted as $\underline{F}$ (10,192) = 2.88 $\underline{p}$ < .005. This led to the acceptance of Hypothesis 2 that there will be a significant difference between the way coaches' and athletes' perceive their environment.

Four of the GES variables were shown by ANOVA to be statistically significant in differentiating between the coaches' and athletes' perceptions of their environment (Table 5). Coaches perceived that they gave more leader support, innovation, leader control, and order and organization.

The top four GES variables that contributed significantly to the between group difference, in a shared sense, in order, were leader support, leader control, independence, and self-discovery.

Table 4

Descriptive Statistics of 10 GES Variables (Form R) for
Coaches and Athletes

Variable	Coaches		Athletes	
	M	SD	M	SD
Cohesion	7.33	2.30	6.80	2.02
Leader Support	8.44	1.29	6.55	2.09
Expressiveness	5.56	1.79	5.62	1.95
Independence	6.50	1.29	5.43	1.65
Task Orientation	6.67	1.53	5.93	2.09
Self-Discovery	5.33	2.47	4.70	1.81
Anger and Aggression	5.94	2.26	5.58	2.28
Order and Organization	6.50	1.92	5.46	2.14
Leader Control	7.61	1.09	5.79	2.19
Innovation	3.72	1.71	4.01	1.71

Table 5

Analysis of Variance for GES Variables (Form R) Between
Coaches and Athletes

Variable	SS	MS	F
Cohesion	840.99	4.18	1.09
Leader Support	834.30	4.15	14.24**
Expressiveness	753.96	3.75	.02
Independence	531.76	2.65	7.14**
Task Orientation	843.22	4.20	2.06
Self-Discovery	707.05	3.52	1.87
Anger and Aggression	1046.06	5.20	.42
Order and Organization	902.45	4.49	3.96*
Leader Control	899.06	4.47	12.17**
Innovation	590.61	2.94	.45

*p < .005.

**p < .001.

Athletes' Real vs Ideal

Through a comparison of the GES Form R and I, specific areas in which athletes perceived a need for change were identified. The means and standard deviations for each of the 10 GES variables for Form R and I appear in Table 6. The overall difference between Form R and I for all variables taken simultaneously was statistically significant, Hotelling's T^2 = .46 which is interpreted as F (10,175) = 7.99, p < .001. This led to the acceptance of Hypothesis 3 that there will be a significant difference between the way athletes perceive their environment in relation to an ideal environment. Follow-up ANOVA revealed significant differences on eight of the GES variables (Table 7). The athletes believed that the ideal baseball environment would contain more cohesion, leader support, independence, task orientation, order and organization, and innovation. They also reported the ideal baseball environment would contain less expressiveness and anger and aggression. Discriminant function analysis revealed the top four discriminant variables to be anger and aggression, leader control, innovation, and order and organization.

Coaches' Real vs Ideal

The means and standard deviations of the GES variables are shown on Table 8. MANOVA revealed no significant overall difference between coaches' perceptions of the real and ideal team climate, Hotelling's T^2 = 1.98 which is

Table 6

Descriptive Statistics of 10 GES Variables (Form R vs I)
for Athletes

Variable	Form R		Form I	
	M	SD	M	SD
Cohesion	6.81	2.02	7.61	1.62
Leader Support	6.55	2.09	7.36	1.81
Expressiveness	5.62	1.95	4.86	1.86
Independence	5.43	1.65	5.98	1.55
Task Orientation	5.94	2.09	6.87	1.76
Self-Discovery	4.70	1.81	4.94	2.02
Anger and Aggression	5.58	2.28	3.97	2.14
Order and Organization	5.46	2.14	6.65	1.85
Leader Control	5.79	2.19	6.10	2.04
Innovation	4.01	1.71	4.68	1.72

Table 7

Analysis of Variance for 10 GES Variables Between
Form R and I for Athletes

Variable	SS	MS	F
Cohesion	476.80	2.59	22.85*
Leader Support	568.19	3.09	18.64*
Expressiveness	523.03	2.84	18.64*
Independence	475.83	2.59	11.09*
Task Orientation	674.61	3.67	22.06*
Self-Discovery	5.23	3.56	1.47
Anger and Aggression	819.99	4.46	53.86*
Order and Organization	676.50	3.68	35.90*
Leader Control	780.90	4.24	2.14
Innovation	458.44	2.49	16.68*

*$p < .001$.

Table 8

Descriptive   Statistics of 10 GES Variables (Form R vs I)
for Coaches

Variable	Form R		Form I	
	M	SD	M	SD
Cohesion	7.33	2.30	8.78	.42
Leader Support	8.44	1.29	8.87	.32
Expressiveness	5.56	1.79	4.67	1.50
Independence	6.50	1.29	6.61	1.61
Task Orientation	6.67	1.53	8.22	.87
Self-Discovery	5.33	2.47	6.67	1.61
Anger and Aggression	5.94	2.26	4.28	2.22
Order and Organization	6.50	1.92	8.28	.96
Leader Control	7.61	1.09	7.50	1.54
Innovation	3.72	1.71	5.17	1.15

interpreted as F (10,8) = 1.59, p > .05. This led to the acceptance of the null hypothesis that there will be no significant difference between the way coaches perceive their environment in relation to a real environment.

Coaches' vs Athletes' Ideal Environment

The means and standard deviations of the GES variables are reported in Table 9. A significant overall group difference was revealed, Hotellings T^2 = .17 which is interpreted as F (10,192) = 3.33, p <.001. This led to the acceptance of Hypothesis 5 that there will be a significant difference between what athletes and coaches perceived as an ideal environment. Follow-up ANOVA revealed a significant difference for six of the GES variables (Table 10). Coaches perceived that the ideal environment would contain more cohesion, leader support, task orientation, self-discovery, order and organization, and leader control than did athletes. Discriminant function analysis revealed the top three discriminating variables to be order and organization, anger and aggression, and self-discovery.

Summary

Results from the CAFIAS data were subjected to MANOVA which revealed that a significant difference existed between the satisfied and less satisfied groups. The major hypothesis that there will be a significant difference in coach-athlete interaction patterns, as measured by eight CAFIAS variables, in different environments was therefore accepted.

TABLE 9

Descriptive Statistics of 10 GES Variables (Form I) for
Coaches and Athletes

Variable	Coaches		Athletes	
	M	S	M	S
Cohesion	8.78	.43	7.61	1.62
Leader Support	8.89	.32	7.36	1.81
Expressiveness	4.67	1.50	4.87	1.86
Independence	6.61	1.61	5.99	1.55
Task Orientation	8.22	.88	6.88	1.76
Self-Discovery	6.67	1.61	4.94	2.02
Anger and Aggression	4.28	2.22	3.97	2.14
Order and Organization	8.28	.96	6.65	1.85
Leader Control	7.50	1.54	6.10	2.04
Innovation	5.17	1.15	4.68	1.72

Table 10

Analysis of Variance for 10 GES Variables (Form I) Between
Coaches and Athletes

Variable	SS	MS	F
Cohesion	487.31	2.42	9.30*
Leader Support	604.23	3.01	12.81**
Expressiveness	677.62	3.37	.19
Independence	485.23	2.41	2.67
Task Orientation	582.00	2.90	10.35*
Self-Discovery	49.18	3.94	12.49**
Anger and Aggression	929.42	4.62	.34
Order and Organization	645.47	3.21	13.47**
Leader Control	32.03	4.03	7.96*
Innovation	567.04	2.82	1.40

*$p < .005$.

**$p < .001$.

Five of the eight CAFIAS parameters used in this study were found by ANOVA to be statistically significant. Coach use of questioning, verbal; coach use of acceptance and praise, verbal; coach use of acceptance and praise, nonverbal; athlete nonverbal initiation, coach suggested; and athlete verbal initiation, coach suggested were the behaviors which were exhibited more in the satisfied group. Discriminant function analysis indicated the three highest contributing parameters to be athlete nonverbal initiation, coach suggested; coach use of acceptance and praise, verbal; and coach use of questioning, verbal.

Interaction patterns of the CAFIAS variables were also compared. The same five patterns appeared in both the satisfied and less satisfied groups. Their rank by percentage of occurrence was different for each group, as illustrated in Table 3.

The GES data from coaches and athletes Form R were subjected to MANOVA. Coaches' perceptions were found to be significantly more favorable than those of the athletes. This led to the acceptance of Hypothesis 2 that there will be a significant difference between the way coaches and athletes perceive their environment.

When the GES Form R and I were compared for athletes, specific areas were identified in need of change. This led to the acceptance of Hypothesis 3 that there will be a significant difference between the way athletes perceive

their environment in relation to the ideal environment. In contrast, when coaches Form R and I were compared no significant difference was found. The null hypothesis that there will be no significant differences between the way coaches perceive their environment in relation to a real environment was therefore accepted.

The fifth hypothesis that there will be a significant difference between what athletes and coaches perceive as an ideal environment was accepted.

Chapter 5

DISCUSSION OF RESULTS

This chapter presents a discussion of the results concluded from this investigation. The study compared the coach-athlete interaction patterns in satisfied and less satisfied baseball environments. Comparisons were also drawn between coaches' and athletes' perceptions of their environment, athletes' perceptions of their environment and an ideal environment, coaches' perceptions of their environment and an ideal environment, and coaches' vs athletes' perceptions of an ideal environment.

Team environments were classified as being satisfied or less satisfied by taking the cumulative absolute differences between Form R and I of the Group Environment Scale (Moos et al., 1974). Coach-athlete interactions were coded with CAFIAS (Cheffers, 1972) and subjected to MANOVA to assess if there were behavioral differences between the two groups. Results indicated that significant differences existed between the interactions in the satisfied and less satisfied groups.

When analyzed independently, five of the eight CAFIAS parameters were found to be statistically significant. These parameters that were exhibited more by the satisfied group than the less satisfied group were coach use of questioning, verbal; coach use of acceptance and praise, verbal; coach use of acceptance and praise, nonverbal;

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athlete nonverbal initiation, coach suggested; and athlete verbal initiation, coach suggested.

Fisher et al. (1982) combined the GES with CAFIAS to investigate the interaction patterns of satisfied and less satisfied basketball teams. Their results were quite similar in indicating coach use of acceptance and praise, nonverbal; athlete verbal initiation, coach suggested; and athlete nonverbal initiation, coach suggested to be present in all three samples of satisfied athletes.

CAFIAS was also employed by Avery (1978) to distinguish interaction patterns between effective coaches and less effective coaches. Results showed that coach use of acceptance and praise, verbal; coach use of acceptance and praise, nonverbal; athlete verbal initiation, coach suggested; and athlete nonverbal initiation, coach suggested occurred more in the effective group. The only parameter which showed significance in favor of the less effective group was athlete nonverbal initiation, athlete suggested.

In the present study the top two variables that accounted for the between group variance were athlete nonverbal initiation, coach suggested and coach use of acceptance and praise. These were also found to favor the effective and satisfied groups by Avery (1978) and Fisher et al. (1982), respectively. It is no surprise that the number one discriminator between groups deals with situation drills and scrimmage situations (8\). If one assumes that at the

high school level the major reason for sport participation is playing the game, would it not then follow that game-like experiences would lead to more satisfaction. The second largest discriminator between groups was coaches' verbal acceptance and praise of their athletes (11.5%). Again, this is hardly surprising. Athletes are performing task oriented activities while their efforts are being appreciated and praised. Conversely, coach acceptance and praise in the less satisfied group accounted for less than 3% of the practice time behavior.

The other two variables that were found to be significant seem to add further reinforcement to athlete satisfaction. Certainly nonverbal acceptance and praise is not unpleasant, and coaches' questioning of athletes would be threatening only if the athlete did not know the answer.

The mean percentages of occurrence of the CAFIAS categories for the present baseball study were compared to those of Fisher et al. (1982) and Rotsko (1979). The results showed a homogeneous grouping of CAFIAS categories for the satisfied and successful groups. In all instances, the satisfied or successful groups included more praise (2), acceptance (3), questions (4), broad interpretations of coach (8\), and athlete to athlete verbal interactions (10). The category of pupil initiative behavior (9) did not appear to favor either group. The remaining five categories of CAFIAS--information giving (5), directions (6), criticism

(7), narrow dependence on coach (8), and athlete to athlete nonverbal interaction (20) without exception occurred more in the less satisfied and less successful group. This similarity of categories between baseball and basketball suggests that satisfied and successful environments, in team sports, may not be strictly sport specific.

Of equal importance to the individual behaviors is the order in which they occur. These interaction patterns can be used to further describe the activity.

A visual examination of the data shows that five of the top eight coach-athlete interaction patterns occurred in both the satisfied and less satisfied groups (Table 3). The percentages of occurrence of these interactions, however, portray two different environments. In the satisfied group the predominant interaction pattern (8\-10-8\) occurred 29.10% of the time. This pattern is characteristic of situation drilling or scrimmage. The interaction patterns of (8\-2-8\) and (8\-3-8\) also suggest the same type of activity but with different degrees of coach involvement. This showed that satisfied groups participated in game-like activities 40.56% of the time compared to 22.62% for the less satisfied. The less satisfied group spent 18.98% of their time receiving directions and mechanically carrying them out (5-6-8) and another 12.1% mechanically interacting with another athlete or athletes (8-10-8).

These results were similar to the findings of Fisher et al. (1982) and Rotsko (1979) for the satisfied and successful groups. Rotsko (1979) reported 8\-10-8\ and 8\-2-8\ to be the predominant patterns which occurred 47.8% of the time in the successful group compared to 33.36% in the less successful. Fisher et al. (1982) reported athlete to athlete interpretive interactions followed by coach praise, encouragement, and acceptance to be the predominant pattern in the satisfied group. The less satisfied group showed a more passive mode which included extended information giving and direction followed by athlete mechanical rehearsal of the coaches' directions.

Fisher and his colleagues interpreted this latter behavior as athletes having a narrow dependency on the coach. To this investigator it suggests a subordinate who has been given robot-like tasks to perform. The necessity or value of the knowledge and skill gained is not being questioned, only the less sensitive process by which it is being sought.

The data seem to indicate the overall picture of coaching behaviors in the satisfied group to be indirect. Information and directions are being offered as guidance while game-like baseball activities are taking place. Positive reinforcement is being used to influence, reward, and motivate athletes to further learning. Quite the opposite is true in the less satisfied environment.

Information is being given in large doses of a lecture format. Athlete activities are being split between game-like and robot-like tasks with reinforcement being given in the negative form, criticism.

It is the belief of this researcher that the major behavioral patterns exhibited in this study for the satisfied group are desirable ones to foster in a baseball coach. The findings in the present study and those reported by Avery (1978), Fisher et al. (1982), and Rotsko (1979) seem to suggest that a similarity of desirable interactions patterns between sports does exist.

Vastly different social environments can be described by a common or similar set of dimensions. The ability of the researcher to identify similar underlying dimensions along which different social environments can be characterized is quite important because it may eventually help to determine why an individual does very well in one environment and quite poorly in another (Moos, 1976).

One way to assess social climates is through the use of the Group Environment Scale (Moos, 1974). Because the GES was developed to assess social climates in social, task oriented groups, it seems appropriate for use in the sports environment. Through the use of two forms of the GES, R and I, it is possible to make several comparisons of perceived and ideal social climates.

When coaches' perceptions of the actual environment
were compared to those of the athletes, a discrepancy
occurred. The coaches perceived that the environment was
more positive including more leader support, independence,
order and organization, and leader control. These findings
are consistent with those of Fisher et al. (1982) in that
coaches perceive their team climate as more positive than do
athletes.

Could coaches have a misconception about their
perception of their real environment which led to the
discrepancy? Percival (1971) claimed that a discrepancy
exists between the level of competency that coaches hold for
themselves and the images they project to their athletes.
This point should not be taken lightly. It may well be the
area through which the athletic experience can be enhanced.
It has been demonstrated that the quality and quantity of
behavioral categories exhibited by a coach will change when
behavioral feedback is given (Rushall & Smith, 1979).
Changes are likely to show an increase in positive and a
decrease in negative behavior.

When the GES subscales were compared with Fisher et al.
(1982), leader support accounted for the most variance
between groups. This was the only subscale that was common
to both. The results suggest that coach-athlete
interpersonal relationships are lacking in the eyes of the
athletes. Carron and Bennett (1977) found the athletes'

need for inclusion behavior to be the most critical factor in determining the difference between compatible and incompatible coach-athlete dyads. A positive relationship was categorized by association, interaction, mingling, and communication.

The discrepancies that appear when comparing Form R with Form I can be identified as areas in which change is perceived to be needed. When athletes' Forms R and I were compared, it was demonstrated that their environment was in need of more cohesion, leader support, independence, task orientation, order and organization, and innovation. The number one desire was for less negative feelings and disagreement. If enjoyment is important, and it could easily be argued that this is a primary objective of competitive athletes, it is easy to see how arguments or bickering could detract from the sport's experience. Leader control was the second subscale identified in need of change. If the coach was to deal with the individual athlete to see that they conform to all rules and sanctions of the group, it is conceivable that it would relieve some of the frustrations that contributed to anger and aggression. By their desire for innovation, the athletes are saying they want a variety of activities to alleviate the boredom of the same old drills and activities day after day. These results display a striking resemblance to those found by Fisher and his colleagues.

When Form R was compared to Form I for the coaches in the current study, there was no significant overall difference. This substantiated the findings of Fisher et al. (1982), in which coaches perceived no difference between their current and ideal team climate.

In the power system perspective of leadership, coaches, not athletes, have the greater potential for exerting influence because they play the predominant role in determination of team climate (Carron, 1980). This would help to explain why coaches perceive their team climate to reflect an ideal team climate. If they were to report discrepancies, it would certainly be a threat to their ego. At this point further explanation is needed to resolve the conflict of athletes' perceived need for change and coaches' contentment with the status quo. In all probability the absolute ideal environment will never be reached, which leaves room for improvements in even the best environment. Another possible explanation may again be in the coaches' perception of their real team climate.

Coaches' and athletes' perceptions of the ideal environment were compared. Coaches showed higher aspiration than athletes for cohesion, leader support, task orientation, self-discovery, order and organization, and leader control. Fisher et al. (1982) also showed that coaches had higher ideals than athletes. It is possible that, due to the coaches' leadership role and higher

commitment to the sport, they naturally would depict the ideal environment higher than athletes.

Summary

Results from the CAFIAS data were subjected to MANOVA and resulted in the conclusion that significant differences existed in coach-athlete interaction patterns between satisfied and less satisfied groups. Of the eight CAFIAS variables, five were found by ANOVA to be statistically significant.

Of the eight CAFIAS variables, the top three which were found to discriminate between groups were athlete nonverbal initiation, coach suggested; coach use of acceptance and praise, verbal; and coach use of questioning, nonverbal. These findings were found to be consistent with those of Avery (1978) and Fisher et al. (1982). Coaches in the satisfied group permitted their athletes the freedom to interact, encouraging athletes to initiate interpretive behavior. These results are further explained by the top eight ranked cell frequencies and their percentage of occurrence. The behaviors that occurred most frequently in the satisfied group were interpretive situation drills and scrimmage. The less satisfied group was characterized by more predictable responses by the athletes.

Comparisons of the GES reflected several findings concerning perceptions of coaches and athletes. Areas in which athletes perceived a need for change were identified

through a comparison of their Form R and I of the GES. Current findings were consistent with data reported by Avery (1978), Fisher et al. (1982), and Rotsko (1979).

Coaches' assessments of their real and ideal environments reflected those found by Fisher et al. (1982). Coaches perceived that their present environment was very close to ideal and that no change was needed. Coaches were found to perceive the actual environment as being more positive than did their athletes. These findings were consistent with Percival (1971) who claimed that discrepancies exist between the level of competency that coaches hold for themselves and the image they project to their athletes.

When coaches' Form I was compared to athletes' Form I, coaches reported higher aspirations for an ideal environment. This seems natural due to the coaches' leadership role and higher commitment to the sport.

Chapter 6

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

FOR FURTHER STUDY

Summary

This study was initiated to analyze and compare coach-
athlete interaction patterns in two different baseball
environments. High school varsity baseball teams and their
coaches from 18 rural schools in central and western New
York State served as subjects. Two 30-minute videotapes
were taken of each team during the latter part of the
baseball season. Form R and I of the GES were administered
at the end of practice to those subjects who volunteered to
be part of the study. Both forms of the GES were also
completed by all coaches at the conclusion of practice.

Teams were designated as satisfied or less satisfied
with their team climate according to how athletes scored
Form R and I of the GES. The absolute difference between
Form R and I was tabulated for each team. The median split
technique was then used to divide teams into two groups.

The videotaped practice sessions were coded using
CAFIAS. Results from MANOVA revealed that a significant
difference existed between the satisfied and less satisfied
groups. When analyzed collectively by ANOVA, five CAFIAS
parameters were found to be statistically significant.
Those parameters which favored the satisfied group were
coach use of questioning, verbal; coach use of

acceptance and praise, verbal; coach use of acceptance and praise, nonverbal; athlete nonverbal initiation, coach suggested; and athlete verbal initiation, coach suggested. Discriminant function analysis revealed the order of importance for each of the CAFIAS parameters. The top three in order of contribution were athlete nonverbal initiaion, coach suggested; coach use of acceptance and praise, verbal; and coach use of questioning, nonverbal.

These indicated that the satisfied group participated more in game-like activities, received more positive reinforcement, and was exposed to a more indirect teaching style. These findings were consistent with those of Avery (1978), Fisher et al. (1982), and Rotsko (1979).

Several comparisons were made using coaches' and athletes' responses from Form R and I of the GES. In all comparisons MANOVA was used to assess the overall difference which existed between groups. Those variables that contributed independently were identified by ANOVA, while shared variance among variables was tested by discriminant function analysis.

When Form R was compared for coaches and athletes, the coaches perceived the environment to be more favorable. The coaches perceived that there was more leader support, independence, leader control, and order and organization present in the environment than did athletes.

The comparison of athletes' Form R and I identified areas in which they perceived change was needed. Eight of the 10 GES variables were identified in need of change. Athletes indicated that the ideal environment would contain higher levels of leader control, order and organization, and innovation. The level of anger and aggression would be lower than that exhibited in their present environment.

A similar comparison was made using coaches' perceptions of the real and ideal environment. No differences were found, which suggests that coaches perceive the present environment to be a reflection of the ideal environment.

One final comparison was made between coaches' and athletes' perceptions of the ideal environment. Coaches perceived that the ideal environment would contain more cohesion, leader support, task orientation, self-discovery, order and organization, and leader control than did athletes. This higher aspiration was probably due to a greater commitment to the sport on the part of the coach.

Conclusions

The following conclusions were established from the findings of this investigation.

1. Indirect coach-athlete interactions are more evident in satisfied athletic environments.

2. Satisfied athletic environments contain more athlete initiated behaviors, coach suggested than less satisfied athletic environments.

3. Coaches in a satisfied environment use more praise and acceptance during practices.

4. Coaches do not perceive their real environments the same way that their athletes do.

5. Athletes' perception of their environment and an ideal environment indicate a need for change in their present team climate.

6. Coaches perceive their environment as being closer to ideal than their athletes in the same environment.

7. Coaches have higher aspirations for an ideal environment than do athletes.

Recommendations for Further Study

1. Conduct a similar study using coaches and athletes from an individual sport setting.

2. Compare coaches' perceptions of interaction patterns with those actually occurring as identified by CAFIAS.

3. Use CAFIAS to compare satisfied and less satisfied athletes with successful and less successful coaches as identified by the Coaches' Performance Criteria Questionnaire.

Appendix A

INFORMED CONSENT FORM—COACH

The study in which you are being asked to take part deals with coaching behavior and social environment. Data for coaching behavior will be collected through videotaping procedures. Two 30-minute videotapes will be made of your practice sessions. You will be asked to wear a microphone during these videotaping sessions. These tapings should interfere as little as possible with your practice. The Group Environment Scale is to be used as the data collection vehicle in measuring social environment. You and your players will be asked to complete two forms of this scale. These forms consist of true-false questions, and each form is estimated to take 10 to 15 minutes to finish.

The Group Environment Scale measures a team along 10 dimensions. Included in these dimensions, of which you will be asked to make a judgment, are cohesion, leader support, leader control, anger, aggression, and order and organization.

The videotapes will be subjected to a widely used interaction analysis system. This interaction system consists of 20 categories designed to describe behaviors exhibited in physical activity settings. The verbal and nonverbal interactions between coaches and players will be recorded.

All information in this study will be kept confidential. If you do not have any questions and agree to be a subject in this study, please sign your name on the line below.

_____

(Signature)

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INFORMED CONSENT FORM--ATHLETE

The study you are being asked to take part in deals with coaching behavior and social environment. Data for coaching behavior will be collected through the use of videotaping procedures. Two 30-minute videotapes will be made of your practice sessions. The Group Environment Scale measures a team along 10 dimensions. Included in these dimensions, of which you will be asked to make a judgment, are cohesion, leader support, leader control, anger and aggression, and order and organization. You and your coach will be asked to complete two forms of this scale. The forms consist of true-false questions, and each form is estimated to take 10 to 15 minutes to finish.

The videotapes will be subjected to a widely used interaction analysis system. This interaction system consists of 20 categories designed to described behaviors exhibited in physical activity settings. The verbal and nonverbal interactions between coaches and players will be recorded.

All information in this study will be kept confidential. If you do not have any questions and agree to be a subject in this study, please sign your name on the line below.

_____

(Signature)

Appendix B

DESCRIPTION OF MOST FREQUENT INTERACTION PATTERNS

8\-10-8\ Athlete to athlete interpretive drills and scrimmage.

5-8\-5 Coach information-giving followed by athlete interpretive response which was followed by further coach information or instruction.

5-6-8 Coach information-giving followed by coach direction which was followed by athlete predictable response.

6-8\-6 Coach direction followed by athlete interpretive response which was followed by further coach direction.

8-10-8 Athlete to athlete predictable response.

5-5 Extended information-giving by the coach.

2-5 Coach praise followed by coach re-instruction.

5-8-5 Coach information-giving followed by athlete predictable response which was followed by further information-giving.

8\-2-8\ Athlete interpretive response followed by coach praise and encouragement which was followed by more athlete interpretive response.

8\-3-8\ Athlete interpretive response followed by coach acceptance.

8\-7 Athlete interpretive response followed by coach criticism.

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