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NONVERBAL BEHAVIORS OF COLLEGIATE FEMALE VOLLEYBALL AND BASKETBALL COACHES AS RECALLED BY ATHLETES AND COACHES

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NONVERBAL BEHAVIORS OF COLLEGIATE FEMALE VOLLEYBALL AND BASKETBALL COACHES AS RECALLED BY ATHLETES AND COACHES

by

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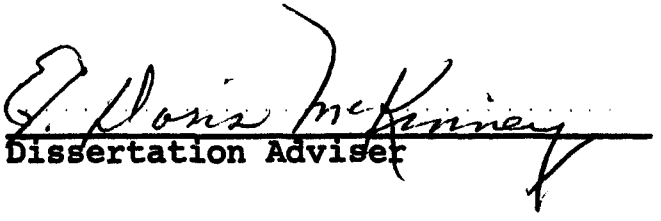

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The purpose of the study was to explore and identify selected observable nonverbal behaviors of collegiate female varsity volleyball and basketball coaches in practice and game situations as recalled by athletes and coaches.

Within the study, answers were sought for nine questions which focused on a set of selected behaviors which might be recalled by coaches and athletes for practice and game situations. In addition, one question examined the agreement between athletes and coaches on selected behaviors for individual coaches.

Twenty-three coaches and 118 athletes, representing 27 teams from 25 of 44 randomly selected colleges and universities, participated in the study during November and December 1979, and January 1980. Coaches and athletes completed the Nonverbal Behavior Descriptor Questionnaire (NBDQ) which they received through the mail.

The Nonverbal Behavior Descriptor Questionnaire (NBDQ) was developed by the investigator during a preliminary study. The NBDQ lists 30 nonverbal behaviors for both practice and game situations as well as three nominal scales. The scales, used to describe behaviors, include displayed-never displayed, instructional-personal, and pleasant-unpleasant. Reliability, established

concurrent to the investigation was reported as percentage of agreement, and averaged 84.48% for 28 athletes, and 86.18% for six coaches.

The data collected from the NBDQ were nominal in nature; therefore, analysis included frequency counts, McNemar's test for related samples, and the chi-square test of independence. Analysis of the data resulted in the following major findings.

1. Athletes and coaches most frequently recalled, although not in the same order of frequency, six of the same behaviors as displayed by coaches in the practice situation. The behaviors included smiles, direct eye contact, head follows movement, and the arm/hand movements which included pointing, directing and uses hands when talking to imitate movement.

2. Athletes and coaches most frequently recalled, although not in the same order of frequency, nine of the same behaviors as displayed by coaches in the game situation. The behaviors included the six behaviors listed above, as well as leans forward while sitting, pats on back and clapping.

3. Although similarities in practice and game situations were noted for behaviors, some differences existed in the practice and game behaviors recalled as "displayed-never displayed" by the coaches and athletes. According to the coaches and athletes, "standing-related posture" behaviors were recalled as behaviors displayed by coaches

in the practice situation. "Sitting-related posture" behaviors as well as touching behaviors were recalled as behaviors displayed by coaches in the game situation.

4. Although similarities in coach and athlete recall were noted, some differences existed in coach and athlete descriptions of practice and game behaviors described as instructional-personal. Coaches generally described the nonverbal behaviors displayed by themselves as personal in the two situations. Athletes generally described the nonverbal behaviors as displayed by the coaches in the two situations as instructional.

5. Individual coaches and their athletes did not recall displayed-never displayed nonverbal behaviors identically. Coaches recalled between 0 and 16 of the players or game nonverbal behaviors identical to those recalled by their athletes.

Within the limits of the exploratory study, it was concluded that the nonverbal behaviors on the NBDQ can be recalled and described by female volleyball and basketball coaches and athletes in game and practice situations. Furthermore, there is a trend toward "standing-related posture" behaviors to be displayed by the coaches in the practice situations, and "sitting-related posture" and touching behaviors to be displayed by the same coaches in the game situations. In addition, there is a tendency for athletes and coaches to describe behaviors that may be instructional or personal differently. Finally, coaches may recall their behaviors differently than they are recalled by their players.

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CHAPTER I

INTRODUCTION

Many aspects of personality functioning in society involve the interaction of the individual with others. This interaction, referred to as communication, involves encoding (sending) and decoding (receiving) messages. It is expressed either verbally or nonverbally. Unlike verbal messages, Harrison (1972) stated, nonverbal messages are learned informally, out of awareness, through imitation or by accident. Nonverbal messages are continuous, natural, subtle, and connotative. Variability exists in the encoding and decoding processes.

Nonverbal communication is one facet of nonverbal behavior. Harper, Wiens, and Matarazzo (1978) defined nonverbal behavior as a physical act which did or did not have meaning. Tripartite in scope, nonverbal behavior encompasses: (a) kinesics--i.e., gestures, movements of the body, limbs, hands, head, feet, legs, facial expressions, eye behavior and posture (Birdwhistell, 1970; Duncan, 1969); (b) proxemics--i.e., man's use of space (Harper, et al., 1978) and (c) paralinguistics--i.e., non-language sounds. The three areas of nonverbal behavior, according to Goffman (1959), signal to others: (a) what an individual is like, (b) whether an individual is

anxious or assured, (c) how the individual views work and others, and (d) how adaptable the person is to a group.

Nonverbal behavior received impetus, as a field of study, with Birdwhistell in 1952 (Harper et al., 1978). Thereafter, anthropologists, linguists, psychologists and sociologists have conducted kinesic, proxemic and paralinguistic research. It has been noted by investigators that there is a lack of consensus as to the best research approach to nonverbal behavior, the domain it encompassed, and its definition (Harper et al., 1978). Duncan (1969) summarized the research of the early contributors to nonverbal behavior. He determined that most of the early study consisted mainly of transcription systems development to categorize and transform behaviors into units of analysis. Subsequent to that summary, it was noted that work on the development of various descriptive systems has continued not only in the behavioral sciences, but also in the field of education. According to Cheffers (1977), interaction analysis systems have provided techniques through which the teaching act has been analyzed, critiqued and refined. Galloway (1971) observed that interaction analysis systems have focused on classroom nonverbal behavior of both teacher and student, together and separately.

Interaction analysis systems, until approximately 1970, were mainly used in the general education classroom environment. Gradually, after that time, within the educational realm physical educators adopted and modified the analysis systems to measure behaviors found predominantly in physical activity classes (Cheffers, Amidon & Rogers, 1974); however, expansion of the systems to physical education rarely included sport. Subsequent study of reported analyses in physical education instructional settings revealed that few studies, if any, were conducted in the sport setting.

The paucity of interaction analysis systems in sport created a void in investigation of coach-athlete relationships. The few studies (Bailey, 1972; Danielson, Zelhart & Drake, 1975; Percival, 1971) undertaken to examine coach-athlete relationships focused primarily on male coaches or athletes. Research, of a nonverbal nature, on female coaches or female athletes is almost nonexistent. With the recent influx of women participating in sport, it seemed appropriate that investigations which focused on female coaches and athletes should be initiated. The important role that nonverbal behavior assumes in communication suggested that such behaviors appearing in the sport setting for women should be studied. Existing tools for study were judged to be inadequate for application to sport; therefore, an interaction analysis

instrument, appropriate for the study of female athletes and their coaches, needed to be developed. One of the first steps, germane to the construction of analysis systems, is the identification of behavioral descriptors. The overall purpose of the present study, therefore, was to aid in the identification of behavioral descriptors which may provide a basis for the development of an interaction analysis system.

Statement of the Problem

The major focus of this study was to explore and identify selected observable nonverbal behaviors of collegiate female varsity volleyball and basketball coaches in practice and game situations as recalled by athletes and coaches.

Within the study, answers to the following questions were sought:

1. What selected observable nonverbal behaviors of collegiate female varsity volleyball and basketball coaches do athletes recall most frequently in the practice situation?

2. What selected observable nonverbal behaviors of collegiate female varsity volleyball and basketball coaches do athletes recall most frequently in the game situation?

3. What selected observable nonverbal behaviors of collegiate female varsity basketball and volleyball

coaches do the coaches themselves recall most frequently in the practice situation?

4. What selected observable nonverbal behaviors of collegiate female varsity volleyball and basketball coaches do the coaches themselves recall most frequently in the game situation?

5. Are there differences between selected practice and game observable nonverbal behaviors of coaches as recalled by athletes that are: (a) displayed-never displayed, (b) instructional-personal, and (c) pleasant-unpleasant?

6. Are there differences between selected practice and game observable nonverbal behaviors of coaches as recalled by coaches that are: (a) displayed-never displayed, (b) instructional-personal, and (c) pleasant-unpleasant?

7. Are there differences between selected observable nonverbal behaviors of coaches as recalled by athletes and coaches in practice situations that are: (a) displayed-never displayed, (b) instructional-personal, and (c) pleasant-unpleasant?

8. Are there differences between selected observable nonverbal behaviors of coaches as recalled by athletes and coaches in game situations that are: (a) displayed-never displayed, (b) instructional-personal, and (c) pleasant-unpleasant?

9. Do individual coaches recall selected observable nonverbal behaviors identical to those recalled by their athletes?

Definitions of Terms

Athlete--a female member listed on selected college or university sponsored intercollegiate varsity basketball or volleyball team roster.

Coach--a female employed by selected college or university who coached an intercollegiate women's varsity basketball or volleyball team.

Description--an observable nonverbal behavior was described as: (a) displayed-never displayed, (b) instructional-personal, and (c) pleasant-unpleasant.

Instructional motion--an observable nonverbal behavior displayed in instructional contexts (i.e., those situations in which directions for learning and performance were being given).

Kinesic behavior (Kinesics)--an observable nonverbal behavior which included gestures, movements of the body, limbs, hands, head, feet, legs, facial expressions, eye-behavior, and posture (Duncan, 1969; Birdwhistell, 1970).

NBDQ--Nonverbal Behavior Descriptor Questionnaire

Observable nonverbal behavior--a physical act, movement, or motion listed on the Nonverbal Behavior Descriptor Questionnaire (NBDQ).

Personal motion--an observable nonverbal behavior displayed that was unrelated to instruction (i.e., gestures that were not related to directions given for learning or performance).

Pleasant behavior--an observable nonverbal behavior displayed that was agreeable.

Unpleasant behavior--an observable nonverbal behavior displayed that was disagreeable.

Assumptions

The following assumptions were made:

1. Nonverbal behaviors would be recalled accurately by female varsity team sport coaches and their female athletes during practice and game situations.

2. Nonverbal behaviors of coaches, recalled during practice and game situations, could be recorded accurately by selected female athletes.

3. Nonverbal behaviors of self, recalled during practice and game situations, could be recorded accurately by female coaches.

4. The Nonverbal Behavior Descriptor Questionnaire (NBDQ) has content validity.

5. Grant and Hennings' (1971) instructional and personal motions, although developed in elementary classrooms, could be applied to the sport environment.

6. Coaches, participating in the study, would follow the directions for administration of the NBDQ as stated in the established administration procedures.

7. Team managers or selected players, participating in the study, would follow the directions for administration of the NBDQ to athletes as stated in the established administration procedures.

8. Coaches and athletes, participating in the study, would respond with honesty on the NBDQ.

Scope of the Study

The study included randomly selected United States collegiate female varsity volleyball and basketball coaches and their female athletes. A minimum of 20 coaches and 100 athletes, responding to the participation requests forwarded to 76 coaches who represented 44 colleges and universities, was accepted as an adequate sample size. The selected behaviors, kinesic in nature, were limited to those listed and described on the NBDQ. Nonparametric analyses, McNemar's test and chi square test of independence, were applied to the frequencies obtained from the nominal data.

The limitations of the study reflected those which would be encountered in any exploratory and descriptive study. Included among those limitations were: (a) the limiting of nonverbal behaviors and descriptors of

observable nonverbal behaviors to those on the NBDQ, (b) the dependence of the data on the accuracy of coach and athlete recall, and (c) the narrowing of the data to be analyzed, thereby excluding coaching experience, playing time, team status or division of play comparisons.

Significance of the Study

The importance of nonverbal behavior has been recognized in the behavioral and social sciences. It is characterized as a dynamic process. It is individual in nature, situation specific, and involves continual encoding and decoding, sending and receiving, of messages by individuals. Recently educational research has supported the importance of the study of nonverbal behaviors. Educators have found that those behaviors are recognizable, that they affect teacher-student interaction, and that they serve both as facilitators of learning and deterrents to learning (Cheffers, 1974; Galloway, 1977; Hall et al., 1977).

Stevenson (1975) stated that descriptors of movements, meanings and contexts should be compiled to study and arrive at a standardized way to observe nonverbal behavior. Once descriptions are compiled, comparisons can be made and relationships derived. Further,

> The comparative analysis of a particular movement in different social context . . . may be an extremely useful design in the discovery of its meaning. . . . such comparisons may determine how the meanings associated with a particular movement alter from social context to social context. (1975, p. 8)

Although compiled and compared movement descriptions were numerous in general education, physical education, especially sport, lacked depth of study in this dimension.

According to existing educational research, nonverbal investigations in sport are rare. Few studies were found which examined the coach-athlete relationship, particularly nonverbal behaviors in that relationship. Good, Biddle and Brophy (1975) stated that teachers were unlikely to be aware of qualitative aspects of their behavior toward individuals. Coaches, too, may have a similar lack of awareness. A comparison of coach-athlete recall of observable nonverbal behaviors may provide insight into displayed behavior that may have bearing on the realization of coaching goals on the part of female coaches. The information derived from the investigation may be useful for inservice training of female coaches in developing effective communication skills. In addition, this investigation may assist in providing a basis on which an observational system can be structured. Therefore, this exploratory investigation may make a contribution toward filling the void existing in nonverbal literature in sport.

CHAPTER II

REVIEW OF LITERATURE

The purpose of this study was to explore and identify selected observable nonverbal behaviors of collegiate female varsity volleyball and basketball coaches in practice and game situations as recalled by athletes and coaches. Literature, relevant to the topic,reviewed included: (a) research in nonverbal behavior and nonverbal communication, (b) selected interaction analysis systems in education, and (c) interaction analysis systems and nonverbal studies in physical education and coaching.

Research in Nonverbal Behavior and Nonverbal Communication

Nonverbal behavior, as a field of study, received impetus from Birdwhistell in 1952 (Harper et al., 1978). Birdwhistell (1972) applied the term kinesics to his study of the visual aspects of nonverbal interpersonal communication. His analysis of body motion, as it related to nonverbal aspects of interpersonal communication, was based on three premises: (a) no movement was an entity in and of itself, (b) bodily patterns were regarded as socially learned, and (c) the meanings of bodily patterns were related to their context.

Structural analysis approach. Birdwhistell's (1972) structural analysis approach to kinesics was divided into pre-kinesics, micro-kinesics, and social kinesics. Pre-kinesics studied physiological determinants, and pre-communicational aspects of body motion referred to as kines. Micro-kinesics identified movement units, kinemes, while social kinesics examined movement patterns, kinemorphs, in social situations. The three kinesic units were a counterpart to formal language. According to Birdwhistell (1970), isolated movements, kines, were equivalent to words. Kinemes, movement patterns, were comparable to language phrases. Kinemorphs, morphological constructs, were analogous to language syntax which were studied and described in social context to determine function.

Scheflen (1976) extended Birdwhistell's initial kinesic analysis and attempted to specify behavioral programs without assigning meaning to the movements. Like Birdwhistell (1972), Scheflen observed and identified units of behavior. According to Scheflen, bodily movements, referred to as points, occurred after utterances of several sentences. Several points, identified as position, denoted conversational attitudes. Finally, presentation was interpreted as the sum of the movements in an interaction. Scheflen used the term territoriality as a way of viewing human behavior. His work which

examined simultaneous movements of people in space involved both kinesic and proxemic behaviors.

External variable approach. Both Birdwhistell (1970) and Scheflen (1976) employed a descriptive or structural approach to nonverbal behavior. Their structural analysis approach which excluded movement meaning and statistical analysis conflicted with Ekman and Friesen's (1968) external variable approach. Ekman and Friesen, not concerned with verbal and nonverbal integration, focused on meanings (emotional states or attitudes) transmitted through movement. They stated five assumptions to their external variable approach. First, nonverbal behaviors functioned as a relationship language which signalled changes in the quality of an ongoing relationship. Second, nonverbal behaviors were the primary modes through which emotions could be communicated. Third, body language conveyed symbolic messages concerning a person's attitude toward self. Fourth, nonverbal behaviors served a metacommunicative function in regulating human disclosure. Finally, nonverbal behaviors were less susceptible to attempts at censorship of communication.

Ekman and Friesen (1968) classified their external variable research of nonverbal behavior as either communicative or indicative. Communicative studies were designed for observers to investigate and attribute

meaning to nonverbal behaviors. One communicative approach identified different communication channels or modes (e.g., audio-visual) for information value. Another approach examined different sources of nonverbal behavior (e.g., hand, foot) for communication. Additional studies were designed to assign meanings to nonverbal acts (e.g., arm movements), or examine specific samples and situations of a person's nonverbal behavior during selected tasks. Communicative studies involved decoding nonverbal behaviors, whereas indicative studies were constructed to examine statistical relationships between nonverbal variables.

Indicative studies, according to Harper et al. (1978), have been favored by many investigators of nonverbal behavior. The adaptability of numerous statistical analyses gave that approach impetus. According to Ekman and Friesen (1968), indicative research methodologies permit investigators to relate nonverbal behaviors to other nonverbal behaviors in terms of frequency, sequence, or co-occurrence. Nonverbal behaviors can be compared to spoken language or, in interaction sequences, the frequency of one person's nonverbal behavior can be related to the other participant's behavior. Other indicative procedures include rating the sender's nonverbal behavior over time, or rating nonverbal behaviors according to the location of the interaction or the role of the participant.

Related research. Ekman and Friesen (1968) have applied both communicative and indicative methodologies in their external variable approach. In one clinical investigation, Ekman and Friesen (1968) used the indicative method when they studied a film of the body of a clinical patient. The film was reviewed to determine movement differences and frequencies during admission and discharge periods. The same study employed the communicative method in which observers, using an adjective checklist, rated films of body areas obtained at admission time. Observers also rated movement form and movement frequency differences between admission and discharge periods. Communication comparisons, which were in agreement, were made between observer's ratings. Ekman and Friesen found that at admission time, according to observers' ratings, foot sliding was most common, whereas during discharge periods, more varied and active foot patterns were noted. Analysis of hand movement revealed consistent patterns between specific movements and verbal content (e.g., "hand-shrug" rotation accompanied confusion or uncertain verbal themes).

In another study, Ekman and Friesen (1969a) examined the value of head and body cues in detecting patient deception. They hypothesized that observers who viewed body cues would miss concealed information

about depression and agitation. The simulated messages that the observers recorded would depict a person's well-being. After viewing a film, Ekman and Friesen's observers rated head-only, body-only, and head-and-body films by using Gough's Adjective Checklist. Ekman and Friesen contrasted the information conveyed by head and face cues to the information conveyed by body cues. The results supported their contention that body movements and cues would be incongruent when lying. The patients' intended message of "being well" was projected by the face, while bodily movements revealed signs of disturbance.

In subsequent studies on nonverbal behavior and deception, Ekman and Friesen (1972, 1974) studied hand movement in deceptive behavior as well as body and face deception. They concluded the following: (a) the face was the major nonverbal liar while the hands were not fakers; (b) the face had the shortest transmission time, while legs and feet were slower, thereby resulting in more hidden patterns; (c) the face was disguised more frequently because people were more aware of facial than of bodily activity; and (d) more accurate judgements on deception were made from the body than of from the face.

Mehrabian (1971) also studied nonverbal behaviors of subjects performing deceitful communication. His

research had subjects either conveying truthfulness while they presented arguments that were in contradiction to their beliefs, or role-playing actual deceit. A third group of subjects were experimentally induced to lie. Mehrabian hypothesized that negative effects, induced by the deceitful behavior, would be conveyed nonverbally. The results showed that subjects gesticulated less, showed fewer leg and foot movements, smiled more, nodded less and used less forward body lean when they were being deceitful than when they were honest.

Using a different communicative approach, Morrison (1961) studied individual differences in the ability to interpret gestures. Two hundred fifty-two normal subjects, ranging between 15 and 47 years old, and 32 schizophrenic patients, paranoid and nonparanoid, completed the Gesture Interpretation Test (GIT). The GIT, drafted by Morrison with the aid of male and female students in theatre arts classes, required subjects to use word descriptors or phrases to describe 57 gesture slides shown for 20-second periods. Of the several findings reported, the most significant one acknowledged commonplace gestures and movements as being sufficiently unambiguous in their impressive meanings so that people matched gestures with a descriptive word or phrase at a level exceeding chance.

Research trends. More recently, Nierenberg and Calero (1977) recorded and analyzed 2500 negotiating situations for gestures. They found that individual gestures grouped together to form gesture clusters. The clusters were the "keys" to people's attitudes, relationships, and situations. Nierenberg and Calero noted in negotiating sessions, that verbal exchange did not operate in a vacuum. It involved people, words, and body movements. They also noted that it was not the spoken word that conveyed the message; rather, the gesture cluster communicated the real inner message which was different from the socially conditioned verbal response.

Other kinesic research reported by Harper et al. (1978) concentrated on therapist variables in the interview situation, body movements relevant to speech patterns, personality variables, and social behaviors. The authors noted that few studies focused on sex differences and fewer yet were conducted on nonwhite populations in the United States. They stated that recent trends in nonverbal research included exploring encoding differences among people as well as differences in decoding abilities.

In 1977, Rosenthal and his associates, including Hall, Archer, DiMatteo and Rogers, at Harvard were innovative in exploring people's sensitivity to

nonverbal cues. They developed the Profile of Nonverbal Sensitivity (PONS) in 1971 to measure differential sensitivity to various channels of nonverbal communication, mainly the face, body and tone of voice. The 45-minute audiovisual test, 16mm film or video cassette, consists of 220 two-second scenes. Pauses between scenes allow test takers to circle one of two descriptors: one correctly describing the situation and one incorrectly describing it. Different components of the test have been developed. One test component, the Non-Verbal Discrepancy Test, containing 128 items, measures how well the viewer detects discrepancies between audio and visual signals. Hall et al. (1977) stated that the PONS is a beginning attempt to measure skills that are relevant to outcomes of interpersonal transactions. Those transactions, according to the authors, include the teacher-student relationship.

Summary. In the above discussion two basic strategies of major contributors to kinesic research were described: Birdwhistell's (1972) structural analysis approach and Ekman and Friesen's (1968) external variable approach. According to Duncan (1969), both approaches were "complementary and mutually facilitating. . . . (and) should be vigorously pursued" (p. 121). Related studies delineated

the following: (a) communication takes place nonverbally through body movements, (b) meaning is attached to the nonverbal communicative behavior, and (c) movement and its meaning should be studied in context.

Selected Interaction Analysis Systems in Education

Hyman (1974) noted that teaching was a form of human behavior involving communication. He stated that ". . . if we are to understand a person's description, explanation, or evaluation of teaching, we need first to understand 'the nature' of his vantage point" (p. 4). Vantage points include: (a) verbal communication, (b) psychological climate, (c) nonverbal communication, (d) nonverbal strategies, (e) learning and cognitive development, (f) games, and (g) aesthetics. Hyman stated that category, sign and rating systems, referred to as observational instruments, were developed to study vantage points. Category systems recorded events only once in a specific time period, whereas, rating systems estimated event frequencies on a point scale.

Observation instruments, as characterized by Simon and Boyer (1970), were metalanguages of communication. The instruments described communicative behavior which ultimately described interaction. Simon and Boyer (1970)

extrapolated seven classifications of interaction from 79 observational instruments. Interaction analysis of the seven classifications involved four processes: (a) a phenomenon was observed, (b) the phenomenon was coded into categories, (c) the coded sequences were reduced to meaningful statements, and (d) the statements were translated into a useful form. Through these processes, interaction analysis systems attempted to maximize systematic recordings of classroom behavior while minimizing observer bias (Batchelder & Keane, 1977). Further, the systems provided "a formula whereby the teaching act could be placed under microscopic scrutiny for analysis, critique and refinement" (Cheffers, 1977, p. 8).

Flanders' Interaction Analysis System (FIAS). One of the first systems which analyzed the teaching act in order to increase teaching effectiveness was developed by Flanders (1970). The Flanders Interaction Analysis System (FIAS) focused on verbal behavior, viewed the classroom teacher as the only individual involved in the teaching process, and described classroom conduct as a unit. FIAS provided explicit procedures for quantifying teacher behavior every three seconds for 20-minute periods. Teacher-student interaction was classified in 10 categories, seven of which pertained to teacher talk, two pertained to student talk, and one

related to silence or confusion. Flanders used the term direct influence to describe those verbal statements of teachers that restrict freedom (i.e., lecture, give directions, criticize. The term indirect influence defined those verbal behaviors of teachers that encourage student freedom (i.e., acknowledge feelings, praise, use student's ideas, ask questions). According to Flanders, student talk was limited (i.e., student responds to teacher), or unlimited (i.e., student initiates or gives unpredictable response).

Martinek and Mancini (1979) noted that FIAS proved to be a valuable system because it recorded actual classroom events as well as the sequence of those events. Further, the authors wrote that many modifications have evolved from the well developed and widely used FIAS system. The modifications (Amidon, 1971: Batchelder & Keane, 1977; Cheffers, Amidon & Rodgers 1974; Dougherty, 1971; et al.) have increased the system's sensitivity, and made possible its application to other instructional settings.

Modified FIAS systems. One modification of FIAS, developed by Amidon (1971), identified teacher nonverbal behaviors that influenced classroom climate and interaction. Amidon's Nonverbal Interaction Analysis (NVIA) supplemented Flanders' ten categories with

nonverbal behaviors (e.g., frown was added to category 7, criticism). The system, divided into two parts, records: (a) preinteraction information, i.e., physical arrangement of the teaching environment and teaching materials found in the room; and (b) interaction data, i.e., nonverbal behavior and classroom activity. Overall, the system describes the duration of verbal and nonverbal behaviors as well as the relationship between the behaviors, and the changes in speakers, materials used, and classroom activity.

To describe the collected data, Amidon (1971), like Flanders (1970), used a 10 x 10 matrix system to record and interpret data. Each cell of the matrix depicts the frequency with which a particular verbal and/or nonverbal sequence occurs during a session (Chapline, 1974). Observers must be well trained and familiar with the observational instrument to use the system.

Amidon (1971) stated that NVIA provides quite a complete picture of the observed classroom. The skills for recording and using the system are flexible, and NVIA can be used live or in conjunction with video equipment.

Another interaction analysis system based on FIAS was developed by Galloway (1968). Galloway, like Amidon (1971), supplemented FIAS with nonverbal behaviors, and

used a double coding system for recording each behavior. Unlike Amidon, each of Galloway's nonverbal behaviors was placed on a continuum which ranged from encouraging to restricting. Nine of Flanders' ten categories were placed on such a continuum. One example of a category was category 7, criticism, which had a continuum of firm to harsh. According to Galloway, only seven of Flanders' ten categories were heavily influenced by nonverbal expressions. Category 1, accepts feeling, was not one of the seven. As a result, Galloway did not place that category on such a continuum.

Other FIAS modifications reported were developed by Parker and French (1971), and Love and Roderick (1971). Parker and French analyzed verbal and nonverbal behaviors of students rather than teachers. Their system, the Student Behavior Index (SBI), placed behaviors on a continuum ranging from self-direction to compliance. Behaviors were coded and reported on a matrix according to the Flanders' system. The major difference between SBI and FIAS was in category classification. Student behaviors, four self-directive and three compliant, were defined in categories 1-7, while teacher behaviors, one direct and two indirect, were defined in categories 8-10. The authors stated the reversal of categories was necessary to accommodate a different approach to analysis of classroom communication.

Although Love and Roderick (1971) did not reverse category descriptions, as did Parker and French, they did alter FIAS categories in order to develop an instrument to record only teacher nonverbal behaviors. Their ten category classification identified and categorized nonverbal behaviors exhibited by a majority of teachers representing different grade levels and various subject areas. FIAS taxonomy was retained to describe the identified behaviors which complemented FIAS verbal behaviors. FIAS taxonomy was eliminated and new categories were created for nonverbal behaviors which contradicted or were unrelated to FIAS categories.

Love and Roderick (1971) used their instrument in a teacher nonverbal unit which they developed for the Teacher Education Task Force at the University of Maryland. The unit was constructed to increase teacher awareness of nonverbal behaviors.

One last adaptation of FIAS discussed in this section and based on CAFIAS (i.e., Cheffers' Adaptation of the Flanders' Interactional Analysis System) is named BAKE. Developed by, and named for, Batchelder and Keane (1977), BAKE concentrates on the characteristics of teacher lecture at the college level. CAFIAS categorical descriptions have been broadened to include lecture characteristics (e.g., CAFIAS category 7-17, criticism, transferred to BAKE 57-57N, criticism

in lecture). Both verbal and nonverbal lecture behaviors are coded according to CAFIAS.

The authors used their system to compare lecture behaviors of college teachers by sex and subject area. Their random sample included 48 male and female science, social science, and humanities teachers. Each subject was observed by one of two reliable observers for 20 minutes. Sixteen parameters of lecture behaviors were used to compare sex and subject area. Batchelder and Keane (1977) found that factual content was the main focus of the lectures that predominated the college classroom (e.g., 83% of classroom time for 48 subjects was lecture). Information-giving lectures were more confined to science than social science or the humanities. Finally, men were less verbal than women in lecturing.

Grant and Hennings' teacher analysis system. Grant and Hennings (1971), unlike the previous investigators, chose to develop the framework for their analysis of verbal and nonverbal teacher behaviors by using Bellack's four pedagogical functions of the teaching act: (a) structuring, (b) soliciting, (c) responding, and (d) reacting. Their approach relied on undergraduate education students who observed and recorded teachers' physical motions. Following observation sessions, the same students were introduced to Grant and Hennings'

instructional and personal motion concept, and then asked to categorize motions from videotaped segments of teacher behavior.

The final analysis system, developed through the above procedure, defines teacher movement as verbal or nonverbal behavior, and assigns the behavior to one of the four pedagogical functions. The behavior or unit is then categorized as instructional (i.e., a motion that serves or facilitates a pedagogical function), or personal (i.e., a motion that does not directly aid in the teaching process). Instructional motions are further classified as conducting, acting or wielding motions. Conducting motions describe behaviors that control student participation or gain student attention. Acting motions describe behaviors that amplify or clarify meaning, while wielding motions describe behaviors that interact with the environment.

Grant and Hennings (1971) found, in analyzing five experienced men and women teachers representing grades 1-5, that 22.1% of the motions used were personal while 77.9% were instructional. The authors also noted, after they examined instructional motions, that teachers were primarily conductors, then wielders, and finally actors.

Using the analysis system as a framework, Grant and Hennings (1971) developed an inventory of nonverbal teaching behaviors which the individual teacher completes.

The inventory is an awareness device and focuses on classroom interaction, mainly instructional motions.

Whitfield's observational system. One of the few investigators to develop a classroom observational system by using pupil perceptions of teacher behavior was Whitfield (1978). Whitfield (1976) asked 360 sixth grade students to report their perceptions of their teachers' classroom nonverbal behavior by completing a 25-item questionnaire, and responding to those same questions during interviews. A panel of judges sorted the 7700 accepted adjective descriptors into 12 categories. Using 10 videotaped teaching episodes, Whitfield (1978) taught observers how to code nonverbal behaviors by the system.

According to Clark and Creswell (1978), Whitfield's study (1976) was one of two reported that considered the learner's perception of nonverbal teacher behavior. Like Whitfield, Clark and Creswell noted that students derive meaning from teacher nonverbal behaviors. As a result, Clark and Creswell decided to study participant and nonparticipant perceptions of teacher behavior.

Clark and Creswell's Teacher Nonverbal Behavior Rating Scale. Clark and Creswell (1978) hypothesized that participants and nonparticipants do not perceive teacher nonverbal behavior identically. To test their hypothesis, the authors developed the Teacher

Nonverbal Behavior Rating Scale (TNBRS). The scale was used to determine the degree of teacher behavior that was encouraging or discouraging. Subjects, using TNBRS, were required to watch videotaped teaching segments twice. After the first viewing, subjects were asked to rate teacher behavior on a 6-point Likert scale (e.g., 1-strongly discouraging to 6-strongly encouraging) every 30 seconds. After the second viewing, subjects were asked to record the cues responsible for their first rating. The cues used in part II were obtained from a pilot questionnaire and other nonverbal communication research. An open-end category was used to identify cues not listed in the original 12.

Five ninth grade math teachers, as well as seven of their students (participants), and seven doctoral candidates (nonparticipants) from the University of Houston participated in the authors' study. Both participants and nonparticipants used the TNBRS to rate videotaped segments of the volunteer teachers.

Clark and Creswell (1978) found that participants and nonparticipants do not perceive teacher nonverbal behavior similarly. Participant observers perceived teacher nonverbal behavior as more encouraging than did nonparticipant observers. Secondly, the authors noted that both groups defined and demonstrated the relevance of nonverbal cues in assessing teacher behavior;

however, major differences were noted in "the order and relevance of predictors for the two groups" (1978, p. 34). Clark and Creswell (1978) concluded that teacher nonverbal behavior can be perceived as encouraging or discouraging. That perception can be measured and analyzed by using videotaped teaching segments.

Summary. In the above discussion, selected interaction analysis systems in education were presented. Flanders' (1970) system, which involved only verbal teaching behavior, was the framework upon which many of the interaction analysis systems in education have been based. As was stated, Amidon (1971) added nonverbal descriptors to FIAS, while Galloway (1968) added a continuum to describe nonverbal behaviors. Love and Roderick (1971) examined only nonverbal behaviors of teachers. Rather than focusing on teacher behavior, Parker and French (1971) reversed the FIAS categories and adapted it to student behavior. Batchelder and Keane (1977) applied Cheffers' adaptation of FIAS to the college lecture situation.

Other systems discussed, different from that of Flanders, were those developed by Grant and Hennings (1971), Whitfield (1978), and Clark and Creswell (1978). Grant and Hennings related verbal and nonverbal behaviors to specific pedagogical processes while the

remaining investigators focused on student perceptions of nonverbal behaviors.

Interaction Analysis Systems and Nonverbal Studies in Physical Education and Coaching

Cheffers (1977) noted that systematic instrumentation in physical education was sparse until 1970. After 1970, Dougherty (1971), Nygaard (1971), Cheffers (1974), Rankin (1975), Martinek and Mancini (1979) developed and utilized interaction analysis systems to identify physical education teaching parameters. Cheffers stated that the systematic observational systems could be used to: (a) describe classroom practices, (b) modify teacher behavior, (c) provide analysis for teaching, (d) provide teacher feedback, (e) train student teachers, (f) show discrepancies in teaching patterns, (g) demonstrate relationships between classroom behavior and student progress, and (h) innovate future teaching patterns. The systems, according to Cheffers, would provide more variety in teaching techniques which ultimately could produce more efficient learning.

Modified FIAS systems and related research. One of the first interaction analysis systems developed for physical education by Dougherty (1971) examined verbal behaviors of physical education teachers. Dougherty modified FIAS by adding category 11, nonverbal activity,

and then dividing the seven teacher-talk categories into two dimensions: one defined interaction with the entire group and the other defined interaction with individuals. Verbal behaviors were coded and reported by FIAS procedures.

Choosing not to modify FIAS, Nygaard (1971) used Flanders' Interaction Analysis System to record and describe verbal interaction in physical education classes. Twenty-minute segments of 19 male and 21 female teachers presenting a new skill to their classes were tape recorded. Reported findings indicated that teachers viewed themselves as classroom authorities and did most of the talking. Males talked 86.8% of the time, while females verbalized 71.4% of the time. Females used more praise, directions, criticisms and justification of authorities than did males. Primary verbal sequences for both males and females showed the following interaction pattern: (a) lecture, followed by silence or confusion, (b) direction, followed by silence or confusion, and (c) lecture.

Cheffers' Adaptation of Flanders' Interaction Analysis System (CAFIAS). One of the most widely employed adaptations of the Flanders' system, used to describe teacher-pupil behavior in physical education activity classes, was developed by Cheffers (1974). Cheffers' Adaptation of Flanders' Interaction Analysis

System (CAFIAS) employed Flanders' 10 categories for verbal behavior, and followed FIAS coding procedures, whereby behaviors were recorded every three seconds for 20-minute observation periods. Like Amidon (1971), Cheffers expanded FIAS to include nonverbal activity (e.g., category 7, criticism, was labelled 7-17 and included gestures and body postures). Cheffers also used a double category system for coding (e.g., 7 verbal was 17 of nonverbal or 7 circled if both verbal and nonverbal behaviors were simultaneously displayed). Another addition to CAFIAS, adapted from Galloway (1968), was a continuum description for nonverbal behaviors (e.g., category 7-17, criticism, could be described as helpful-destructive, soft-hard). Cheffers, like Galloway (1968), omitted Flanders' category 1, accepts feeling.

Two additional classifications, often overlooked in general teaching assessment instruments, which Cheffers (1974) identified, were diversification of the teaching agent and unit of class function. According to Cheffers, a teaching agent could be the classroom teacher, the learner or student, or the physical environment, whereas the unit of classroom function describes the class functioning as an entire unit (W), the class functioning in small groups (P), or the class functioning without the teacher (I). These additions,

according to Martinek and Mancini (1979) increased the flexibility of CAFIAS in the teacher-learning process. Martinek and Mancini (1979) stated that in the last five years CAFIAS has been used to evaluate projects, verify treatments, determine sex behavioral differences in analyzing educators, modify teacher behavior, assess curricula, and estimate and predict behavior.

Paterson (1975) used CAFIAS to describe, analyze and compare behavioral interaction patterns of novice and trainee male physical educators. Paterson videotaped 10 trainee, 10 novice and 10 experienced physical educators teaching a skill to their classes. Findings indicated no difference in the instructional interaction patterns between the groups; however, significant differences were found in the amount of time the classes spent working as a whole, in small groups, or as individuals. Paterson noted that trainees spent more time with the whole group while novice teachers spent less time with the whole group. The investigator concluded that little or no relationship existed between teaching experience and instructional interaction patterns of male physical education teachers.

Modified CAFIAS systems and related research. One adaptation of CAFIAS, reported by Martinek and Mancini (1979), provides a method to record and analyze individual student and teacher interaction. According to the authors, Dyadic Adaptation of CAFIAS (DAC) "is intended to provide pre-and in-service teachers with descriptive data regarding their teaching behavior directed to individual students" (1979, p. 19). The DAC employs CAFIAS coding procedures. In addition, student identification is established and noted prior to the observation session. Dyadic interaction is coded when the teacher is interacting in small groups. Coding dyadic interaction continues until the interaction ceases or teacher behavior shifts toward other students.

Martinek and Mancini (1979) reported a study in which five experienced elementary physical education teachers were asked to rate their students according to how they expected each to perform in terms of physical achievement. Those students receiving the 10 highest and 10 lowest ratings from their teachers were selected for the study. Using DAC, two coders recorded individual teacher-student behaviors five times over a period of 16 weeks. The investigators found high achievers receiving more praise, encouragement, and contact from their teachers than low achievers.

Another adaptation of CAFIAS, developed by Rankin (1975), provides a method for teachers and supervisors to evaluate verbal and nonverbal behaviors of student teachers in elementary physical education classes. Divided into 10 categories, Rankin's Interaction Analysis System (RIAS) includes five verbal categories (i.e., teacher talk, teacher rejection, student talk, student feedback, and teacher praise) and five nonverbal categories (i.e., student smiling, student moving, student frowning, teacher gesture, and confusion).

Using RIAS, Rankin (1975) studied verbal and nonverbal communication of 10 male and 32 female student teachers in elementary school physical education classes for grades K-3 and 4-6. Rankin compared sex, personality type based on dominance and submissiveness, grade levels, and verbal-nonverbal relationships. Findings indicated female student teachers in elementary physical education classes used more gestures than their male colleagues. Submissive personality types rejected their students more frequently than dominant personality types. Rankin also noted that frowning, a student behavior, occurred more often in grades 4-6, and students who actively participated in physical education were more content and happy than those students who watched and listened.

Additional analysis systems. Unlike the preceding investigators, Laubach (1975) developed a descriptive system to code student behavior from videotaped physical education classes. The Behavior of Students in Physical Education (BESTPED), developed by Laubach, considered four dimensions of student behavior: (a) function, (b) mode, (c) time, and (d) content. A fifth dimension, teacher evaluation, was added to be applied only to teacher education rather than used for research purposes.

Other systems, developed by Lunt (1974) and Lord (1979), considered behaviors of dance teachers. Lunt examined teacher-student verbal and nonverbal interaction in the teaching of choreography. She found that nonverbal behaviors were related to cognitive, affective, kinetic, and technical teaching domains. Symbols were developed to record nonverbal teacher and student behaviors. The system, according to Lunt, was a means of preserving behavior sequences, acknowledging technical aspects of videotaped materials, and recording class organization of choreography.

Lord's Adaptation of the Joyce system (LAJS), developed for the dance area, was used to record verbal and nonverbal behaviors of dance teachers in technique and choreography classes. Lord (1979) adapted Joyce's model, five CAFIAS categories, CAFIAS coding procedures, and Grant and Hennings' (1971) instructional and personal

motion concept in developing LAJS. According to the author, LAJS has limited potential for use in the description of dance classes.

Coaching assessment systems. Smith, Smoll, and Hunt (1977) developed the first system to examine coaching behaviors during practice and game situations. The Coaching Behavioral Assessment System (CBAS), consisting of 12 categories and concerned with verbal and nonverbal behaviors, involves recording basic coach-situation interactions. The authors use the term "reactive behaviors" to describe responses of a coach to immediately preceding behaviors of player or team. "Spontaneous behaviors" describe behaviors that are initiated by the coach; they are not responses to immediately preceding events. Observers using the system must be well trained. Smith et al. (1977) stated that CBAS can assess effects of coaching preparation, and can be used to train coaches how to relate more effectively to players.

To date, CBAS is the only interaction analysis system, reported in the literature, specifically constructed to examine verbal and nonverbal coaching behaviors in sport. Studies reported on coach-athlete relationships are scarce because of the paucity of interaction analysis systems in sport. Those few studies examining coach-athlete relationship, relevant to this study yet devoid of nonverbal descriptions,

were reported by LaGrand (1970), Percival (1971), and Danielson, Zelhart, and Drake (1975).

Related research. LaGrand (1970) investigated the range of athletes' responses to behavioral characteristics of their coaches. Three hundred and four athletes (i.e., members of basketball, wrestling, soccer and tennis teams) participated in the study. The athletes completed a semantic differential instrument, using 10 bipolar adjectives, to analyze 14 concepts related to behavioral characteristics of athletic coaches. Findings of the study acknowledged a hierarchy of behavioral characteristics existing among coaches, and profile differences between individual and team sport coaches. LaGrand (1970) suggested a study be undertaken to devise a tool to assist in collecting detailed information of desirable behavioral characteristics of coaches and judged by their athletes.

Another study, examining coaching behaviors, was conducted by Percival (1971). Over a three-year period, Percival collected data through interviews and questionnaires from 382 high school and college athletes (318 males, 64 females) and 66 coaches (42 males, 14 females) involved in 25 sports. Percival analyzed the behaviors of the Canadian coaches and compared athletes and coaches analyses. In general, coaches thought themselves to be more effective leaders than did their

athletes in the areas of positive coaching personality, techniques and methods, general knowledge, and mechanics of coaching. Individual sport athletes gave their coaches lower positive rankings than team sport athletes did. In addition, Percival (1971) analyzed his own behavior using films, tape recorders, and peer-athlete observations. He concluded that his own self-perceptions, as a coach, were at odds with peer judgements and incongruent with his athletes' observations.

From his data collection, Percival (1971) constructed a list of coaching types. One list reflected 25 positive coaching qualities while the other list reflected 15 negative coaching qualities. Specific verbal and nonverbal behaviors were not analyzed.

Another investigation, conducted by Danielson, Zelhart, and Drake (1975), determined the dimensionality of commonly perceived coaching behaviors as perceived by adolescent hockey players. One hundred sixty players (12-18 years old), attending a summer sport camp, were asked to indicate on the Coach Behavior Description Questionnaire whether the 140 items were true or false of their last season's coach. Danielson et al. (1975) found that communicative behaviors, involving passing of information to or from the coach, were more characteristic of hockey coaches than dominant behaviors. The

communicative dimension did not include nonverbal behaviors descriptive of leadership qualities among coaches.

Summary. In the above discussion, interaction analysis systems and nonverbal studies in physical education and coaching were presented. Many of the systems discussed were based on FIAS (Cheffers, 1974; Dougherty, 1971; Rankin, 1975) or CAFIAS (Lord, 1979; Martinek and Mancini, 1979; Rankin, 1975). Additional systems mentioned included: (a) Lunt's (1974) system for examining verbal and nonverbal behaviors in the teaching of choreography, (b) Laubach's (1975) system for coding student behavior in physical education classes, and (c) Smith et al. (1977) Coaching Behavioral Assessment System for examining verbal and nonverbal coaching behaviors in practice and game situations.

The studies presented, employing FIAS or CAFIAS, described verbal interaction in physical education classes (Nygaard, 1971), or compared novice and trainee male physical educators (Paterson, 1975). Martinek (1979) used DAC to examine the relationship between teachers and high-low achievers in elementary physical education classes. Rankin (1975) studied verbal and nonverbal behaviors of male and female student teachers. Related coaching research, conducted by LaGrand (1970), Percival (1971) and Danielson et al. (1975), examined

athletes' perceptions of coaching behaviors but did not employ interaction analysis systems or consider nonverbal behaviors.

In summary, the review of literature, divided into three parts, discussed: (a) research in nonverbal behavior and nonverbal communication, (b) selected interaction analysis systems in education, and (c) interaction analysis systems and nonverbal studies in physical education and coaching. Throughout the review, there were a number and variety of interaction analysis systems, developed for education and physical education, which were reviewed. All of the systems presented described rather than evaluated behavior. The systems identify small behaviors or acts that can be measured and categorized. Another common feature of the systems presented is their dependency on the accuracy of observer ratings. According to Smith et al., (1977), objectivity can deteriorate over time or as familiarity with the instrument increases. Further, objectivity is affected by observer bias and expectations about what will be observed, as well as the selectivity of the behavior to be observed. Finally, subject behavior can be altered as the result of being observed or videotaped.

Each of the systems presented has tried to eliminate problems associated with decreased objectivity.

Martinek and Mancini (1979) stated that the student-teacher interaction should be identified prior to the observation session. The identification facilitates the elimination of observer bias and the selectivity of the behavior to be observed. Another method, employed by FIAS, CAFIAS, and subsequent modifications, requires observers to record teaching behaviors every three seconds for 20-minute periods.

Despite the inclusion of procedures to eliminate decreased objectivity in observational devices, some systems counteract themselves by including a "catch-all" category or by requiring observers to describe behaviors according to a continuum. CAFIAS requires observers to place behaviors on a continuum (e.g., category 7, criticism, is described as soft-hard, helpful-destructive). This requirement lends itself to observer subjectivity in behavior description.

Most systems compensate for observer subjectivity by requiring observers to be trained in the system. FIAS, CAFIAS, and subsequent modifications require observers to undergo many hours of stringent and extensive training to become proficient in the use of their systems. The training method, considered both an advantage and also a shortcoming, reduces a system's availability and extensive application.

Of all the systems reviewed, Whitfield's (1976) system was the only one not developed from investigator, peer, or college student observations. Instead, Whitfield (1976) relied on recall of elementary school students of teacher behaviors to develop the instrument. According to Whitfield, student perception of teacher behavior can influence teacher-student interaction. Clark and Creswell's (1978) study lends credence to Whitfield's position. The authors found, through their investigation, that participants' perceptions of their teachers were different from nonparticipants' perceptions of the same teacher. If, according to Cheffers (1977), we are to undertake the investigation of the effects of process in education by comparison to the product, more scales should be developed from the student's perspective.

Although Grant and Hennings did not use elementary school students' perceptions in the development of their teacher analysis system, they did separate instructional and personal motions of teacher behavior. Further, they categorized the verbal and nonverbal behaviors facilitating pedagogical functions. If the teaching act is to be examined, then Grant and Hennings' system is a viable approach to looking at only those behaviors associated with teaching functions.

In conclusion, it can be stated that the nonverbal dimension is an important dimension to be studied. In general education and physical education, observational systems were developed to study verbal and nonverbal teacher-student interactions and relationships; however, the paucity of interaction analysis systems in sport has created a void in investigation of both male and female coach-athlete relationships. In order to construct an analysis system to study coach-athlete relationships, behavioral descriptors must be identified. The overall purpose of the present study was to aid in the identification of behavioral descriptors which may provide a basis for the development of an interaction analysis system. The literature reviewed has presented various techniques to consider in this process.

CHAPTER III

PROCEDURES

The purpose of this study was to explore and identify selected observable nonverbal behaviors of collegiate female varsity volleyball and basketball coaches in practice and game situations as recalled by athletes and coaches. The procedures included the completion of a preliminary study to develop a nonverbal behavior checklist and a main study in which the checklist was applied.

Preliminary Study

The preliminary study was completed in order to develop and refine a nonverbal checklist which would tap the recall of respondents, and to determine the expediency of conducting a full scale study.

During the fall of 1978, a preliminary study was conducted to identify appropriate nonverbal behaviors to be included in a nonevaluative checklist, and to determine the feasibility of conducting a study based on recall of subjects.

An open-ended word cue list of nonverbal behaviors was devised by the investigator for the first phase of the study. The list, designated as the Open-ended Word Cue List for Nonverbal Behaviors (see Appendix A),

consisted of 14 body-relevant word cues, derived from previous investigators (Birdwhistell, 1970; Harper et al., 1978). Athletes were to associate the word cues with the outstanding bodily movements they noticed in their coaches. Approximately 15 physical education instructors and/or coaches agreed to participate in administering the word cue list to their students. A total of 160 male and female athletes, representing one junior high school, five high schools, and three colleges responded. The athletes, responding to the list of fourteen body-relevant word cues, generated 150 descriptive nonverbal behaviors. The nonverbal behaviors were analyzed for generalities and idiosyncracies. Idiosyncratic behaviors were deleted, while behaviors that were common to many lists remained. From among the remaining behaviors, those nonverbal behaviors which were listed by 15 or more athletes received the highest frequency scores, and were retained for a checklist developed and used in the second phase of the preliminary study.

The Nonverbal Coaching Behavior Checklist (see Appendix A) was devised by the investigator for the second phase of the study. The checklist consisted of the 72 nonverbal behaviors, associated with eight bodily regions, that athletes had generated during the first phase of the preliminary study. Having obtained a list of behaviors, descriptions were needed to describe

the behaviors; therefore, three descriptive categories were added. Those categories were frequency, intensity, and feeling. Athletes completing the checklist were asked to respond only to those behaviors which described their coach by checking: (a) the frequency with which their coach used the behavior, (b) the intensity of the movement, and (c) whether or not the behavior was pleasant or unpleasant. Fifty male and female athletes, some of whom participated in the first phase of the preliminary study, described seven male and three female coaches with 28 of the 72 nonverbal behaviors. The athletes represented one high school, which originally participated in the preliminary study, as well as one college within the same vicinity. The small sample that resulted was due to the time limitation placed on the second phase of the preliminary study, which made many of the original schools, having received mailed materials, inaccessible.

Following the first two steps involved in the preliminary study, it became necessary to make minor revisions to the 28 nonverbal behaviors most frequently cited as descriptors on the Nonverbal Coaching Behavior Checklist. The revisions were in accordance with procedures for developing a questionnaire (Partin, 1966), and were considered necessary because frequency discrepancies resulted both from category redundancy and limited circulation of the Nonverbal Coaching Behavior Checklist.

Consequently, four of the 28 nonverbal behaviors were collapsed. "Waves arms" and "moves arms up and down" were combined to become "waves arms up and down." "Moves arms/ hands when talking" and "imitates movement" were combined to become "uses hands when talking to imitate movement." Thereafter, four nonverbal behaviors, which received extremely low frequency scores on the Nonverbal Coaching Behavior Checklist yet had extremely high frequency scores on the Open-ended Word Cue List for Nonverbal Behaviors, were added. The behaviors added included "arms folded," "clenches fists," "scratches head," and "runs fingers through hair." Finally, 24 of the 28 nonverbal behaviors, as generated by athletes on the Open-ended Word Cue List for Nonverbal Behaviors, were retained. In addition, the six behaviors, arrived at through collapsing categories and adding behaviors, resulted in a total list of 30 behaviors. The behaviors were listed on the Revised List of Nonverbal Behaviors (see Appendix A), and are the behaviors listed on the NBDQ (see Appendix B) employed in the main study.

The procedure used to develop the 30 nonverbal behaviors has been employed and supported by several investigations (Smith & Kendall,1963; Harari & Zedeck, 1974). Smith and Kendall (1963) developed evaluative rating scales from behaviors identified and retranslated by their subjects. According to Smith and Kendall:

> The potential advantages of scales based on such procedures are obvious: they are rooted in, and referable to, actual observed behavior; evaluations of the behavior have been made by judges at least reasonably comparable to those who will eventually use the scales. (1963, p. 154)

Harari and Zedeck (1974) lend credence to Smith and Kendall's (1963) procedure. They stated, as a result of a scale being constructed by the rating population:

> Conceptually independent dimensions are obtained which elicit consensus among raters as to the construct validity and exhaustiveness of the broad areas of performance that should be evaluated. (Harari & Zedeck, 1974, pp. 261-262)

Further, Harari and Zedeck (1974) noted that retaining student terminology eliminated response biases and favored honest and conscientious ratings. Hence, it was concluded that by using Smith and Kendall's (1963) procedure, the NBDQ established content validity as it was being developed.

Although the preliminary study demonstrated that a checklist having content validity could be developed, difficulties with ambiguous descriptive categories such as intensity suggested that further refinement to reduce the possibility of an evaluative response was required. The changes included deleting the intensity category, while the frequency category was reduced to behavior displayed-never displayed. The feeling category, pleasant-unpleasant, was retained.

One final change consisted of adding categories identified by Grant and Hennings (1968) for their Inventory for Analyzing Non-verbal Teacher Activity. Those categories were instructional and personal which described the function of nonverbal behaviors: They were reported to have reliability coefficients of .94 to .99. Although the function of nonverbal behavior had not entered into the checklist developed by athletes, it appeared that its inclusion to describe nonverbal coaching behaviors would be appropriate, since it was recognized that coaching frequently involves pedagogical behaviors (Cratty, 1973). Therefore, instructional motion was added to describe behaviors which facilitate the teaching process, and are displayed in situations where directions for learning and performance are being given. Personal motion, often an idiosyncratic adjusting behavior, was added to describe those behaviors not related to directions given for learning or performance, yet displayed in pedagogical situations.

Once category adjustments were completed ,the final list contained the 30 nonverbal behaviors identified by athletes, and three descriptive categories, referred to as nominal scales (see Appendix B). The completed instrument was designated as the Nonverbal Behavior Descriptor Questionnaire (NBDQ).

One last consideration during the final drafting of the NBDQ, which was initiated prior to the main study, concerned scoring. The NBDQ, as conceived and constructed as a descriptive questionnaire, did not lend itself to reporting an absolute score even though nominal scales are reported as frequency data, and can be reported on a hierarchy. Instead, the NBDQ, as constructed, requested individuals to continue describing only those behaviors they checked as displayed. If few behaviors were displayed, count data for the nominal scales, and ultimately the total questionnaire, depreciated in magnitude. As a result, the reporting of an absolute score for the NBDQ would not have had meaning; therefore, no such scoring was used, nor was any other scoring method employed. Frequency data was the only method considered.

Finally, after the above processes were completed, size, color and layout of the questionnaire were finalized. The decision was made to number the booklets to facilitate counting mailed returns. Thereafter, once the questionnaire directions, definitions, and demographic material were edited, the NBDQ was forwarded to a professional printer where the form was set by linotype and printed on letter-press. According to Partin (1966) and Dillman (1978), the above considerations are paramount to constructing a questionnaire, and affect the number of returns and the accuracy of the reported data.

To ascertain the feasibility of using recall of subjects as an effective method to collect descriptive data of nonverbal behaviors of coaches during practice and game situations, athletes first used free recall to identify coach nonverbal behaviors associated with body-relevant word cues. Thereafter, athletes, some of whom were in the original preliminary study sample, used cued recall and identified only those listed nonverbal behaviors they associated with their coach.

Despite subjective reporting of personal impressions and the possibility of personal biases affecting individual recall, the use of recall as an investigation technique has been supported by several investigators (Bower & Gilligan, 1979; Cantor & Mischel, 1979; Jeffery & Mischel, 1979). Findings reported by the investigators indicated that subjects unified information about individuals, and recalled both trait and situational factors. Subjects also recalled more information about individuals displaying consistent behavior patterns. Moreover, the recall process was enhanced when cued recall was employed, and when information was related to self, or to a person the subject knew well.

Hence, it was concluded, within the limitations of the preliminary study, that recall could be applied effectively. Athletes demonstrated that they could recall behaviors by both free and cued recall methods, and that

they could categorize behaviors. Furthermore, it was decided that by using recall, the questionnaires could be mailed, thus permitting the inclusion of a larger population of athletes and coaches than could have been included if a different procedure had been used.

Main Study

Upon completion of the preliminary study, the main investigation was initiated in late 1979, and early 1980. The procedures for the main study involved the identification of subjects, securing of informed consent, mailing of questionnaires, administration of questionnaires, and follow-up.

Sources of Data

A randomly selected subject population and the NBDQ, as revised in the preliminary study, provided the sources through which data were gathered.

Subjects. The selection of the subjects consisted of identifying first the colleges and universities for inclusion in a random sample, and then selecting the coach and athlete sample.

Prior to the initiation of the selection processes, minimum parameters for coaches and athletes to be studied were established. That minimum was 20 coaches and 100 athletes. The number decided upon was deemed appropriate for an exploratory and descriptive study particularly since coaches and athletes were randomly selected.

In order to insure an adequate subject sample, subject selection was increased fourfold. The increase was based on the reports of many investigators (Dillman, 1978; Kerlinger, 1973; Moser & Kalton, 1972; Partin, 1966) that returns from mail surveys, the method which was used in this study, varied from 10-50% without follow-up. The assumption was made that most colleges employed two different coaches: one for volleyball, and one for basketball (Franks, 1978); therefore, although 10 colleges could fulfill the minimum coach sample size of 20, 40 colleges were selected. Thus, if only 25% responded, the conditions of sample size would have been satisfied. Furthermore, to compensate for those colleges that might list the same individual as coaching both volleyball and basketball, four additional colleges were selected.

A total of 44 colleges and universities (see Appendix C) were randomly selected from the 1978-1979 Directory of College Athletics, Women's Edition (Franks,1978). Random selection was made in accordance with the following steps:

1. Franks' (1978) page range of United States senior and junior colleges was noted.

2. Two lines of numbers, located on each page of the random number tables in Mendenhall, Ott and Schaeffer (1971), were recorded.

3. Two dice were rolled. The resultant number was noted after all but four of the random numbers recorded in step 2. The number one, a compensation for not being able to obtain a number one by rolling dice, was listed for the remaining numbers.

4. Forty-four colleges and universities were randomly chosen by first using the random number recorded in step 2 to locate the directory page (step 1). Thereafter, the dice number in step 3 was used to locate the college or university listed on the selected directory page.

5. Colleges and universities that listed men as coaching basketball or volleyball were disregarded. The dice were rolled again, and a new number was recorded for the page.

6. Colleges and universities that listed only one female as coaching both basketball or volleyball were retained.

7. If the dice number was greater than the college listing on a specific page, the dice were thrown until the resultant number could be located.

In addition to the 44 colleges and universities randomly selected to participate in the investigation, six safety schools were identified by the investigator to serve as alternates, if necessary, and to establish reliability of the NBDQ. Although the focus of the main study was only to explore and identify nonverbal behaviors,

it was decided to determine the reliability of the descriptors listed in the NBDQ. Such a determination ultimately would affect possible future applicaion of the NBDQ. The test-retest method of reliability was conducted concurrent with the investigation.

The six safety schools chosen to participate in the reliability check were not randomly selected through the procedures established for colleges participating in the investigation. Instead, one college, which participated in both phases of the preliminary study, was selected because the college volunteered to assist the investigator in the present study. The remaining five safety schools were institutions in which the athletic director, basketball, or volleyball coach were known to the investigator.

Following the college and university random selection process, 76 collegiate female coaches, 38 involved with volleyball and 38 with basketball, employed by the 44 randomly selected colleges and universities, were invited to participate in the main study. Of the 76 coaches invited, 8 volleyball coaches, and 22 basketball coaches volunteered to participate. Of the 30 volunteer coaches, 23 actually participated. This figure exceeded the required minimum of 20 coaches.

Once participating coaches were identified, it was possible to select the athletes to be included in the

study. The procedures considered subject anonymity to secure more candid responses; therefore, the procedures required the team manager or a selected player, instead of the coach, to identify athletes in a manner specified by the investigator. Specifications required that if a team did not have a team manager, a player selected by the coach was to assume the responsibility. The method directed the team manager, or selected player, to alphabetize and number the team roster, then to match 10 randomly ordered numbers to the alphabetized and numbered team roster. The 10 randomly ordered numbers, obtained by rolling dice, had been determined previously by the investigator and listed as part of the written instructions for administration procedures which were sent to the participating coach for distribution to the team manager, or selected player. The five athletes whose roster numbers matched the first five random numbers listed were asked to participate in the study. If any athlete rejected the participation request, the team manager, or selected player, used the second five random numbers in order of their listing to select the remaining athletes.

Through the specified selection procedure, 150 collegiate females were identified as eligible to participate in the investigation. Of the 150 eligible athletes, 118 actually participated in the study. Their

ages ranged from 18 to 23 years. Of those 118 athletes, 28 were involved with volleyball, and 90 with basketball. Furthermore, the 118 participating athletes exceeded the required minimum of 100 athletes.

Within the safety schools, selected by the investigator, the procedures employed to identify coaches and athletes were the same as those described above. The safety school sample was comprised of six schools with 12 coaches. From among the 12 coaches, 4 volleyball and 2 basketball coaches, as well as their 30 athletes, actually participated. Reasons for not participating were given as "male coach," "no team," "season over," and "late starting season." Of the 30 participating athletes, with an age range of 18 to 21 years, 2 athletes from one team failed to return their retest questionnaires. Therefore, the 2 athletes were eliminated leaving a total of 28 athletes and 6 coaches completing both the test and retest questionnaires.

Instruments. The main study employed the Nonverbal Behavior Descriptor Questionnaire (NBDQ) to collect data (see Appendix B). The NBDQ was a modification and elaboration of the Nonverbal Coaching Behavior Checklist (see Appendix A) used in the preliminary study. It was constructed to identify nonverbal behaviors, not to evaluate or score them. The questionnaire contained 30 nonverbal behaviors and three descriptive categories for both

practice and game situations. Prior to the main study, the NBDQ was determined to have content validity. Reliability measures were conducted concurrent with the main investigation.

Collegiate female varsity volleyball and basketball teams were selected to complete the NBDQ. Both types of sport were conducted in environments which facilitated observation of nonverbal behaviors because of the proximity of coach to player.

Collection of Data

Data were collected during November and December 1979, and January 1980. The steps involved in the collection of data were: (a) the mailing of introductory letters to athletic directors and coaches, (b) the mailing of instructions for sampling of athletes and administering the NBDQ, (c) the completion and return mailing of NBDQ by coaches and athletes, and (d) the follow-up of delayed responses.

Introductory letters. A letter of introduction describing the investigation and soliciting cooperation was mailed first to the athletic directors of the 44 randomly selected colleges and universities, as well as the athletic directors of the six safety schools (see Appendix D).

If a negative response was not received within a week from the athletic directors of the 44 randomly selected colleges and universities, a letter of introduction

and an informed consent form pertinent to the investigation with a request to participate were forwarded to 76 female coaches (38 volleyball and 38 basketball). A stamped, addressed, return postcard with the printed consent was included (see Appendix D). Identical introductory materials were forwarded to six volleyball and six basketball coaches within the six safety schools.

Investigation materials. If a coach returned an affirmative response on the postcard enclosed in the introductory materials, instructions and questionnaires were forwarded. A complete set of investigation materials included: (a) a return letter to the coach, (b) five athlete participation request letters, (c) addressed, return postcards with the informed consent form for the athletes, coach, and team manager, (d) six questionnaires, with stamped, addressed, return envelopes for the coach and athletes, and (e) instructions for administration procedures which included the 10 randomly ordered numbers for athlete selection. At the same time, directions for first and second distribution of the NBDQ, and six additional questionnaires with stamped, addressed, return envelopes for the coach and athletes (see Appendix D) were forwarded to the safety schools.

Completion of the NBDQ. Administration materials, which were sent to the coach, were to be distributed to the team manager, or selected player. The team manager, or selected player, was requested to select athletes by the previously stated procedures detailed under identification of data sources. Once the selection process was completed, the team manager, or selected player, could elect to assemble the athletes for briefing either before or after a practice session. Flexibility in time selection avoided game-related pressures, as well as practice-related scheduling factors. During the briefing, the athletes were to read the athletes participation request letter (see Appendix D). If athletes agreed to participate, the team manager, or selected player, gave the athletes an informed consent form postcard and the NBDQ with an attached, stamped, addressed, return envelope.

In order to synchronize questionnaire completion, and to assure anonymity, all athletes were requested to complete the investigation materials at the same time. The team manager, or selected player, instructed the athletes to complete the investigation materials on the evening of the day on which the materials were received, and to mail both items to the investigator on the following day. The team manager, or a selected player, completed the instructions to the athletes by reading a short paragraph (see Appendix D) from the investigator, and by

informing the groups that the coach would respond to a questionnaire which was identical to the one they would answer. To increase continuity of questionnaire completion within teams, coaches were requested to complete their investigation materials the same evening as their athletes. This request was made by the investigator in the return letter to the coach (see Appendix D).

Follow-up procedures. The follow-up processes were comprised of contacting both participating coaches whose materials were incomplete, and those coaches who had completely failed to respond to the initial participation request.

In late December, the participating coaches were contacted. Postcards were sent to 25 of the 30 coaches who had indicated a willingness to participate in the study, but had failed to meet the December 7, 1979, deadline date with a complete set of materials. Of the 25 coaches contacted, 15 coaches were informed that a specific number of questionnaires and/or consent forms were missing from their team. The remaining 10 coaches were informed that none of the investigation materials had been received from their team; they were requested to complete the materials during January, 1980. As a result of this follow-up procedure, 63 additional questionnaires were received by the investigator. The additional questionnaires received increased the total number of participants to 141,

i.e., 23 coaches and 118 athletes. The total represented 27 teams of which only 13 were complete teams.

In late January, the investigator proceeded to telephone in alphabetical order 19 of the 24 coaches, representing 31.58% of the sample, who had failed completely to return the postcards included in the initial participation request letter. This procedure, recommended by Mendenhall et al. (1971), was deemed necessary in order to eliminate some of the bias introduced into a sample because of a low response rate. Of the 19 coaches telephoned, 10 were contacted, while 9 could never be reached. Of the 10 coaches contacted, 4 stated they would not have participated in the study because of their overload of teaching and coaching responsibilities. Two had returned the postcards to their athletic director to forward. One coach had mislaid the postcard. The other coach stated that there was no return postcard in the original mailing.

Four of the 10 coaches listed other reasons for not responding to the original letter. Among the reasons listed were "male coach," "coach hospitalized," "materials never received," and "materials received during state tournament time" which was the termination of the season.

Two of the 10 coaches stated they would have participated; however, one coach's season had terminated whereas, the other coach thought she had forwarded her affirmative answer on the return postcard.

In spite of the follow-up procedure, no further materials were received by the investigator; therefore, the total number of participants was 141. The total represented 27 teams from 25 colleges, or 57%, of the randomly selected college and university sample.

Once both follow-up procedures were completed, a statistician at the University of North Carolina at Greensboro was consulted concerning the randomness of the sample. It was concluded that the follow-up procedures were adequate; therefore, it was feasible to ascertain that the randomness of the sample remained intact.

Data Analysis

The data collected through this investigation were nominal in nature. According to Daniel (1978), numbers or quantities describe nominal data while nonparametric statistics are applied to analyze the data. The statistical methods selected to facilitate both the description and comparison of the nonverbal behaviors of coaches in practice and game situations included the reporting of frequency data, the application of McNemar's test for related samples, and the chi-square test of independence. The selected methods were applied to the nine questions as follows:

1. Frequency data were reported for questions 1 through 4, and question 9. Questions 1 through 4 pertained to the behaviors which were recalled most

frequently by either coaches or athletes in both game and practice situations. Question 9 pertained to individual coaches' recall of selected observable nonverbal behaviors identical to those recalled by their athletes.

2. McNemar's test (Daniel, 1978) for related samples was used in the analysis of questions 5 and 6. Both questions compared the 30 nonverbal behaviors in practice and game situations that athletes or coaches described as: (a) displayed-never displayed, (b) instructional-personal, and (c) pleasant-unpleasant. In order to describe the differences in the practice and game behaviors, McNemar's test required that questions 5 and 6 be restated into null hypotheses. Once the hypotheses were stated, McNemar's test examined net changes in the frequencies which fell into the nominal scales. The .05 level of significance was selected both to allow for the detection of differences in the data, and to accept or reject the null hypotheses tested in both questions.

3. The chi-square test of independence was used in the analysis of questions 7 and 8 in which frequency data obtained from independent or unrelated sources (i.e., coaches and athletes) were to be compared. In order to describe the differences between the selected observable nonverbal behaviors of coaches as recalled

by athletes and coaches, the chi-square test of independence required the restatement of the two questions into null hypotheses. Again, the .05 level of significance was employed both to detect differences in the data and to accept or reject the stated null hypotheses.

In addition to selecting the statistical methods used to answer the nine questions, the method of percentage of agreement scores, used to determine reliability of nominal or categorical data, was chosen to express the reliability of the NBDQ by the test-retest method.

Using a formula based on Good and Brophy's (1973) percentage of agreement formula (i.e., percentage of agreement = agreement / total decisions), percentage of agreement scores were computed for each of the six categories listed on the NBDQ (i.e., three game situation categories and three practice situation categories), as well as the total questionnaire.

CHAPTER IV

ANALYSIS AND DISCUSSION OF DATA

The purpose of this study was to explore and identify selected observable nonverbal behaviors of collegiate female varsity volleyball and basketball coaches in practice and game situations as recalled by athletes and coaches. Within the study, answers to nine questions were sought. In addition, the test-retest method for establishing the reliability of the NBDQ was used.

Analyses

In order to analyze the descriptive data, and answer the nine questions presented in Chapter I, frequency data and nonparametric statistics which included McNemar's test for related samples, and chi-square test of independence, were employed.

Questions 1 and 2 were stated so that a general picture can be drawn as to which behaviors were displayed most frequently by all of the coaches studied, rather than what behavior a specific coach displayed. Data were organized so that no one coach nor one group of athletes could be identified, although, according to the number of returned questionnaires, each of the 27 coaches was

individually described by from two to five athletes. As a result, the frequencies listed for each behavior are inclusive of the responses of all of the athletes as a group about the displayed behavior of all of the coaches as a group. The percentage figures for each behavior represent the proportion of the 118 athletes who recalled the behaviors of coaches as a group.

Question 1

What selected observable nonverbal behaviors of collegiate female varsity volleyball and basketball coaches do athletes recall most frequently in the practice situation?

The data for the selected observable nonverbal behaviors of 27 collegiate female varsity volleyball and basketball coaches that 118 athletes recalled as displayed most frequently in the practice situation are organized in descending order by frequency and percentages and are displayed in Table 1.

According to the figures in Table 1, all of the 30 nonverbal behaviors were recalled as displayed by their respective coaches by some proportion of the 118 athletes. Of the 30 behaviors, 19 behaviors displayed by coaches were recalled by 50% or more of the athletes, while 6 of the 30 behaviors were recalled by over 80% of the 118 athletes. The six behaviors recalled by the highest

Table 1

Displayed Nonverbal Behaviors of Coaches Recalled by Athletes in the Practice Situation

Item #	Behavior	Recall Frequency	Recall Percentage
1	Smiles	111	94.07%
24	Directing	108	91.53
30	Uses hands when talking to imitate movement	106	89.83
23	Pointing	105	88.98
4	Direct	102	86.44
7	Follows movement	100	84.75
2	Frowns	94	79.66
9	Straight	86	72.88
22	Pats on back	84	71.19
26	Clapping	80	67.80
8	Erect	79	66.95
18	Touches Shoulder	78	66.10
13	Arms folded	76	64.41
10	Legs spread shoulder width	72	61.02
11	Hands on hips	67	56.78
16	Slow	66	55.93
6	Shaking	64	54.24
15	Leans forward while sitting	64	54.24
3	Stares	59	50.00
20	Arm around player	58	49.15
12	Hands in pockets	55	46.61
29	Waves arms up and down	55	46.61
17	Pacing	54	45.76
5	Looks away, up, down, around	51	43.22
25	Scratches head	38	32.20
14	Sits up straight on bench	37	31.36
27	Clenches fists	36	30.51
19	Shakes hand	34	28.81
28	Runs fingers through hair	34	28.81
21	Hugs	17	14.41

Note. The table represents data on 27 coaches recalled by 118 athletes on their respective coaches.

proportion of the athletes included "smiles," "directing," "uses hands when talking to imitate movement," "pointing," "direct," and "follows movement." The behaviors characterize movements of the face, eyes, head, and arm/hand.

The frequencies and percentages for those athletes who checked the behavior as never displayed are not shown in Table 1; however, the figures can be computed by subtracting the frequency of the displayed behaviors from 118. For example, if 111 athletes checked the behavior as displayed, then seven athletes checked the behavior as never displayed. The percentage figures for the never displayed behaviors can be computed by dividing the never displayed frequency by 118.

Question 2

What selected observable nonverbal behaviors of collegiate female varsity volleyball and basketball coaches do athletes recall most frequently in the game situation?

The data for the selected observable nonverbal behaviors of 27 collegiate female varsity volleyball and basketball coaches that 118 athletes recalled as displayed most frequently in the game situation are organized in descending order by frequency and percentages and are displayed in Table 2.

According to the figures in Table 2, all of the 30 nonverbal behaviors were recalled as displayed by their

Table 2

Displayed Nonverbal Behaviors of Coaches Recalled by Athletes in the Game Situation

Item #	Behavior	Recall Frequency	Recall Percentage
4	Direct	108	91.53%
30	Uses hands when talking to imitate movement	107	90.68
26	Clapping	104	88.14
1	Smiles	103	87.29
22	Pats on back	103	87.29
24	Directing	102	86.44
7	Follows movement	99	83.90
23	Pointing	99	83.90
15	Leans forward while sitting	98	83.05
2	Frowns	91	77.12
18	Touches Shoulder	84	71.19
9	Straight	76	64.41
8	Erect	71	60.17
20	Arm around player	69	58.47
6	Shaking	66	55.93
13	Arms folded	66	55.93
14	Sits up straight on bench	63	53.39
19	Shakes hand	62	52.54
10	Legs spread shoulder width	61	51.69
11	Hands on hips	60	50.85
17	Pacing	56	47.46
29	Waves arms up and down	53	44.92
3	Stares	52	44.07
16	Slow	50	42.37
27	Clenches fists	45	38.14
12	Hands in pockets	44	37.29
5	Looks away, up, down, around	42	35.59
25	Scratches head	36	30.51
28	Runs fingers through hair	36	30.51
21	Hugs	33	27.97

Note. The table represents data on 27 coaches as recalled by 118 athletes on their respective coaches.

respective coaches by some proportion of the 118 athletes. Of the 30 behaviors, 20 were recalled by 50% or more of the 118 athletes, while 9 of the 30 behaviors were recalled by over 80% of the 118 athletes. The nine behaviors recalled by the highest proportion of the athletes were "smiles," "directing," "uses hands when talking to imitate movement," "pointing," "direct," "follows movement," "clapping," "pats on back," and "leans forward while sitting." The behaviors characterize posture and touching behaviors, as well as movements of the face, eyes, head, and arm/hand. The group of six behaviors listed by over 80% of the athletes for the practice situation in Table 1, although not in the same order of frequency, are six of the same behaviors recalled most frequently by over 80% of the athletes for the game situation (see Table 2).

The frequencies and percentages for those athletes who checked the behavior as never displayed are not included in Table 2; however, the figures can be computed by subtracting the frequency of the displayed behaviors from 118. For example, if 108 athletes checked the behavior as displayed, then 10 athletes checked the behavior as never displayed. The percentage figures for the never displayed behaviors can be computed by dividing the never displayed frequency by 118.

Questions 3 and 4 are stated so that a general picture can be drawn as to which behaviors were displayed most frequently by all of the coaches studied, rather than what behavior a specific coach displayed. Data were organized so that no one coach could be identified. As a result, the frequencies listed for each behavior are inclusive of all of the coaches as a group who recalled themselves as displaying the behavior. The figures presented in the table for each behavior represent the proportion of the 23 coaches who recalled themselves displaying the behavior in the practice situation.

Although the original sample involved 27 coaches, full responses were received from only 23; therefore, the data analysis for questions 3 and 4 represents only those coaches who completed the requested data.

Question 3

What selected observable nonverbal behaviors of collegiate female varsity volleyball and basketball coaches do coaches recall most frequently in the practice situation?

The data for the selected observable nonverbal behaviors of 23 collegiate female varsity volleyball and basketball coaches that the 23 coaches recalled themselves as displaying most frequently in the practice situation are organized in descending order by frequency and percentages and are displayed in Table 3.

Table 3

Displayed Nonverbal Behaviors of Coaches Recalled by Group of Coaches in the Practice Situation

Item #	Behavior	Recall Frequency	Recall Percentage
1	Smiles	23	100.00%
7	Follows movement	23	100.00
2	Frowns	22	95.65
24	Directing	22	95.65
30	Uses hands when talking to imitate movement	22	95.65
4	Direct	21	91.30
13	Arms folded	20	86.96
9	Straight	19	82.61
22	Pats on back	19	82.61
23	Pointing	19	82.61
26	Clapping	18	78.26
6	Shaking	17	73.91
18	Touches shoulder	17	73.91
10	Legs spread shoulder width	16	69.57
16	Slow	16	69.57
8	Erect	14	60.87
17	Pacing	14	60.87
11	Hands on hips	13	56.52
12	Hands in pockets	13	56.52
20	Arm around player	12	52.17
3	Stares	10	43.48
5	Looks away, up, down, around	10	43.48
15	Leans forward while sitting	9	39.13
29	Waves arms up and down	9	39.13
28	Runs fingers through hair	7	30.43
14	Sits up straight on bench	6	26.09
25	Scratches head	6	26.09
27	Clenches fists	6	26.09
19	Shakes hand	5	21.74
21	Hugs	3	13.04

Note. The table represents data on 23 coaches recalled by the same 23 coaches.

According to the figures in Table 3, all of the 30 nonverbal behaviors were recalled by some proportion of the aggregate group of coaches as behaviors they displayed in the practice situation. Of the 30 behaviors, 20 were recalled by 50% or more of the coaches as behaviors they displayed in the practice situation, while 10 of the 30 behaviors were recalled by over 80% of the 23 coaches. The 10 behaviors recalled by the highest proportion of the coaches included "smiles," "follows movement," "directing," "uses hands when talking to imitate movement," "direct," "pointing," "frowns," "arms folded," "straight," and "pats on back." The behaviors are characterized as posture and touching behaviors, as well as movements of the face, eyes, head, and arm/hand.

It may be of interest to note (see Table 3) that the first six of the 10 behaviors listed, although not in the same order of frequency, are the same as those behaviors recalled most frequently by athletes for the practice situation (see Table 1), as well as the game situation (see Table 2).

Question 4

What selected observable nonverbal behaviors of collegiate female varsity volleyball and basketball coaches do the coaches themselves recall most frequently in the game situation?

The data for the selected observable nonverbal behaviors of 23 collegiate female varsity volleyball and

basketball coaches that the 23 coaches recalled themselves as displaying most frequently in the game situation are organized in descending order by frequency and percentages and are displayed in Table 4.

According to the figures in Table 4, all of the 30 nonverbal behaviors were recalled by some proportion of the aggregate group of coaches as behaviors they displayed in the game situation. Of the 30 behaviors, 19 were recalled by 50% or more of the 23 coaches as behaviors they displayed in the game situation, while 10 of the 30 behaviors were recalled by over 80% of the 23 coaches. The 10 behaviors recalled by the highest proportion of the coaches included "follows movement," "leans forward while sitting," "pats on back," "smiles," "frowns," "direct," "pointing," "directing," "uses hands when talking to imitate movement," and "clapping." The behaviors are characterized as posture and touching behaviors, as well as movements of the face, eyes, head, and arm/hand.

It may be of interest to note (see Table 4) that nine of the behaviors listed, although not in the same order of frequency, were identified by the athletes as behaviors their coaches most frequently displayed in the game situation (see Table 2).

In summary, the analysis of questions 1, 2, 3, and 4 showed that all 30 behaviors were recalled by at least

Table 4

Displayed Nonverbal Behaviors of Coaches Recalled by Group of Coaches in the Game Situation

Item #	Behavior	Recall Frequency	Recall Percentage
7	Follows movement	22	95.65%
15	Leans forward while sitting	22	95.65
22	Pats on back	22	95.65
1	Smiles	21	91.30
2	Frowns	21	91.30
4	Direct	21	91.30
23	Pointing	21	91.30
24	Directing	21	91.30
30	Uses hands when talking to imitate movement	21	91.30
26	Clapping	20	86.96
6	Shaking	17	73.91
20	Arm around player	17	73.91
18	Touches shoulder	16	69.57
19	Shakes hand	15	65.22
13	Arms folded	14	60.87
16	Slow	14	60.87
9	Straight	13	56.52
5	Looks away, up, down, around	12	52.17
8	Erect	12	52.17
3	Stares	10	43.48
11	Hands on hips	10	43.48
17	Pacing	10	43.48
21	Hugs	10	43.48
27	Clenches fists	10	43.48
14	Sits up straight on bench	9	39.13
29	Waves arms up and down	9	39.13
10	Legs spread shoulder width	8	34.78
25	Scratches head	8	34.78
12	Hands in pockets	7	30.43
28	Runs fingers through hair	7	30.43

Note. The table represents data on 23 coaches recalled by the same 23 coaches.

some proportion of both coaches and athletes as displayed in both practice and game situations. In the practice situation, each of the behaviors was recalled as displayed by at least 14.41% of the athletes and 13.04% of the coaches. In the game situation, each of the behaviors was recalled as displayed by at least 27.97% of the athletes and 30.43% of the coaches. Of the 30 behaviors, approximately 20, or 66.67%, were recalled as displayed by coaches in game and practice situations by 50% of the athletes and 50% of the coaches. Six to 10, or 20-33.33% of the nonverbal behaviors were recalled as displayed by coaches in game and practice situations by 80% of the athletes and 80% of the coaches. The behavior with the lowest percentage was recalled with higher frequencies in the game than in the practice situation by the athletes. For example, "hugs," the lowest recalled behavior in the game situation, was recalled by 27.97% of the athletes. In the practice situation, "hugs," again the lowest recalled behavior, was recalled by only 14.41% of the athletes. A similar observation was made of coaches. The behavior with the lowest percentage was recalled with higher frequencies in the game than the practice situation by the coaches. For example, "runs fingers through hair," the lowest recalled behavior in the game situation, was recalled by 30.43% of the coaches. In the practice situation, "hugs,"

the lowest recalled behavior, was recalled by only 13.04% of the coaches.

Questions 5 and 6 required a comparison of the coaches' practice and game behaviors as recalled by athletes and by coaches. Each question consisted of three parts: (a) displayed-never displayed, (b) instructional-personal, and (c) pleasant-unpleasant. If the respondent checked a behavior as displayed on the NBDQ, then that respondent determined whether or not the behavior was instructional or personal, and pleasant or unpleasant. Respondents checking never displayed could be counted only in that category or in that part of the question. In order to complete the comparative analysis, it was necessary to apply McNemar's test for related samples to detect differences, and the significance of the differences for behaviors recalled as displayed-never displayed, instructional-personal, and pleasant-unpleasant. The application of the McNemar test required a statement of the null hypothesis with the .05 level of significance as a basis for supporting or rejecting the hypothesis (Daniel, 1978). Therefore, each of the three components of question 5, and of question 6, were stated as null and alternate hypotheses.

For each hypothesis, the data, recalled by athletes and then by coaches,for all game and practice behavior comparisons were organized into 2 x 2 contingency tables

by using the Statistical Analysis System (Barr et al., 1979). The figures, recorded in the contingency tables, were used to compute the test statistic for the McNemar test. The test statistic employed was a Z score which has a known sampling distribution, thus facilitating the determination of the probability of an obtained result under the null hypothesis. The .05 level of significance resulted in identifying 1.96 as the critical level for the Z score. Negative Z scores indicated that behaviors were recalled more in the practice than the game situation. Positive Z scores indicated that the behaviors were recalled more in the game than the practice situation.

Question 5

Are there differences between selected practice and game observable nonverbal behaviors of coaches as recalled by athletes that are: (a) displayed-never displayed, (b) instructional-personal, and (c) pleasant-unpleasant?

Behavior displayed-never displayed. The null hypothesis (H_o) and the alternate hypothesis (H_a) for the testing of each of the 30 behaviors were as follows.

H_o: Athletes recall the same selected observable nonverbal behaviors of coaches in both practice and game situations that are displayed-never displayed.

H_a: Athletes do not recall the same selected observable nonverbal behaviors of coaches in both practice

and game situations that are displayed-never displayed.

Z scores and p values for displayed-never displayed practice and game behaviors, recalled similarly by athletes, are presented in Table 5. According to Table 5, 16 of the 30 nonverbal behaviors had Z scores < 1.96; therefore, the null hypothesis (H_o) was tenable for those behaviors. Athletes did recall the same selected observable nonverbal behaviors of coaches as displayed-never displayed in both practice and game situations. As indicated by the negative Z scores, nine of the 16 behaviors were recalled more as displayed in the practice than the game situation, while seven of the behaviors tended to be displayed more in the game than the practice situation. In addition, of the 16 displayed behaviors recalled similarly, nine behaviors were recalled by over 50% of the athletes as occurring in both practice and game situations, while behaviors 3, 5, 17, 25, 27, 28, and 29 were recalled by over 50% of the athletes as never displayed behaviors in the practice and game situations (see Tables 1 and 2).

Z scores and p values for displayed-never displayed practice and game behaviors, recalled differently by athletes, are presented in Table 6. Negative Z scores indicate that behaviors were more frequently recalled as displayed in the practice situation. Positive Z scores indicate that behaviors were more frequently recalled as displayed in the game situation.

Table 5

Displayed-Never Displayed Practice and Game Behaviors Recalled Similarly by Athletes

Item #		Z score	p value
2	Frowns	- .90	.3682
3	Stares	- 1.53	.3260
4	Direct	1.50	.3776
5	Looks away, up, down, around	- 1.67	.0850
6	Shaking	.39	.6966
7	Follows movement	- .28	.7794
8	Erect	- 1.78	.0750
11	Hands on hips	- 1.40	.1616
17	Pacing	.38	.7040
18	Touches Shoulder	1.28	.2006
24	Directing	- 1.73	.1236
25	Scratches Head	- .50	.6170
27	Clenches fists	1.80	.0718
28	Runs fingers through hair	.58	.5620
29	Waves arms up and down	- .63	.5286
30	Uses hands when talking to imitate movement	.45	.6528

Minus sign indicates displayed behavior recalled more frequently in the practice situation.

Table 6

Displayed-Never Displayed Practice and Game Behaviors Recalled Differently by Athletes

Item #	Behavior	Z score	p value
1	Smiles	-2.31	.0208*
9	Straight	-1.96	.0500*
10	Legs spread shoulder width	-2.40	.0164*
12	Hands in pockets	-1.97	.0488*
13	Arms folded	-1.96	.0500*
16	Slow	-3.27	.0000**
23	Pointing	-2.12	.0340*
14	Sits up straight on bench	4.00	.0000**
15	Leans forward while sitting	5.52	.0000**
19	Shakes hand	4.80	.0000**
20	Arm around player	2.29	.0220*
21	Hugs	3.58	.0000**
22	Pats on back	3.96	.0000**
26	Clapping	4.54	.0000**

*$p \leq .05$

**$p \leq .01$

Minus sign indicates displayed behavior recalled more frequently in the practice situation.

According to Table 6, 14 of the 30 nonverbal behaviors had $\underline{Z}$ scores $\leq$ 1.96; therefore, the alternate hypothesis (H_a) was accepted for those behaviors. Athletes did not recall the same selected observable nonverbal behaviors of coaches as displayed-never displayed in both practice and game situations. The first seven behaviors listed in Table 6 are behaviors that were recalled more frequently as displayed in the practice situation than the game situation (see Tables 1 and 2). The behaviors can be characterized as "standing-related posture" behaviors. The last seven behaviors listed in Table 6 are behaviors that were recalled more frequently as displayed in the game situation than in the practice situation (see Tables 1 and 2). The behaviors can be characterized as "sitting-related posture" behaviors and touching behaviors. The NBDQ (see Appendix B) shows that the 14 behaviors, which were found to be significantly different by McNemar's test, consisted of mainly posture/stance and touching behaviors, although one face, one walking, and two arm/hand behaviors were included.

Behavior displayed: Instructional-personal. The null hypothesis (H_o) and the alternate Hypothesis (H_a) for the testing of each of the 30 behaviors were as follows.

H_o: Athletes recall displayed observable nonverbal behaviors of coaches that are instructional-

Table 7

Displayed Instructional-Personal Practice and Game Behaviors Recalled Similarly by Athletes

Item #	Behavior	Z score	p value
1	Smiles	0.00	1.0000
2	Frowns	- 1.53	.1260
4	Direct	- 1.21	.2262
5	Looks away, up, down, around	- 1.34	.1802
6	Shaking	- 1.13	.2584
7	Follows movement	- .45	.6528
8	Erect	- .30	.7642
9	Straight	- .58	.5620
10	Legs spread shoulder width	0.00	1.0000
11	Hands on hips	1.26	.2076
12	Hands in pockets	- .82	.4122
13	Arms folded	.47	.6384
14	Sits up straight on bench	- .38	.7040
15	Leans forward while sitting	- 1.21	.2262
16	Slow	- .63	.5286
17	Pacing	- 1.00	.3174
18	Touches shoulder	- .71	.4778
19	Shakes hand	1.00	.3174
20	Arm around player	- .28	.7794
21	Hugs	1.73	.0836
22	Pats on back	- 1.86	.0628
23	Pointing	.58	.5620
25	Scratches head	0.00	1.0000
26	Clapping	- .33	.7414
27	Clenches fists	- 1.34	.1802
28	Runs fingers through hair	- .58	.5620
29	Waves arms up and down	- .82	.4122
30	Uses hands when talking to imitate movement	.45	.6528

Minus sign indicates instructional behavior recalled more frequently in the practice situation.

personal similarly in both practice and game situations.

H_a: Athletes do not recall displayed observable nonverbal behaviors of coaches that are instructional-personal similarly in both practice and game situations.

$\underline{Z}$ scores and $\underline{p}$ values for displayed instructional-personal practice and game behaviors, recalled similarly by athletes, are presented in Table 7. According to Table 7, 28 of the 30 nonverbal behaviors had $\underline{Z}$ scores < 1.96; therefore, the null hypothesis (H_o) was tenable for those behaviors. Athletes did recall displayed instructional-personal behaviors of coaches similarly in the practice and game situations. Of the 28 displayed instructional-personal behaviors recalled similarly, athletes tended to describe 19 behaviors as instructional more in the practice situation, and six behaviors as instructional more in the game situation. Three behaviors, indicated in Table 7 by 0.00, were described identically (see Appendix E, Table A).

$\underline{Z}$ scores and $\underline{p}$ values for displayed instructional-personal practice and game behaviors, recalled differently by athletes, are presented in Table 8. According to Table 8, two of the 30 nonverbal behaviors had $\underline{Z}$ scores ≥ 1.96; therefore, the alternate hypothesis (H_a) was accepted for those behaviors. Athletes did not recall

Table 8

Displayed Instructional-Personal Practice and Game Behaviors Recalled Differently by Athletes

Item #	Behavior	Z Score	p Value
3	Stares	-2.86	.0042*
24	Directing	2.00	.0456*

*p ≤.05

displayed instructional-personal behaviors similarly in the practice and game situations. Although both behaviors were more frequently described as instructional than personal (see Appendix E, Table A), a higher percentage of athletes described "stares" as instructional in the practice than in the game situation. "Directing" was described by a higher percentage of athletes as instructional in the game than in the practice situation.

Behavior displayed: Pleasant-unpleasant. The null hypothesis (H_o) and the alternate hypothesis (H_a) for the testing of each of the 30 behaviors were as follows.

H_o: Athletes recall displayed observable nonverbal behaviors of coaches that are pleasant-unpleasant similarly in both practice and game situations.

H_a: Athletes do not recall displayed observable nonverbal behaviors of coaches that are pleasant-unpleasant similarly in both practice and game situations.

Table 9

Displayed Pleasant-Unpleasant Practice and Game Behaviors Recalled Similarly by Athletes

Item #	Behavior	Z score	p value
1	Smiles	-1.00	.3174
2	Frowns	0.00	1.0000
3	Stares	0.00	1.0000
4	Direct	.83	.4066
5	Looks away, up, down, around	-1.41	.1586
6	Shaking	0.00	1.0000
7	Follows movement	-1.00	.3174
8	Erect	-1.41	.1586
10	Legs spread shoulder width	0.00	1.0000
12	Hands in pockets	-1.00	.3174
13	Arms folded	- .30	.7642
14	Sits up straight on bench	1.00	.3174
15	Leans forward while sitting	0.00	1.0000
16	Slow	-1.41	.1586
17	Pacing	- .45	.6528
18	Touches shoulder	0.00	1.0000
19	Shakes hand	1.00	.3174
20	Arm around player	-1.00	.3174
21	Hugs	0.00	1.0000
22	Pats on back	0.00	1.0000
23	Pointing	- .38	.7040
24	Directing	1.73	.0836
25	Scratches head	1.00	.3174
26	Clapping	-1.00	.3174
27	Clenches fists	-1.00	.3174
28	Runs fingers through hair	-1.73	.0836
29	Waves arms up and down	-1.13	.2584
30	Uses hands when talking to imitate movement	- .45	.6528

Minus sign indicates pleasant behavior recalled more frequently in the practice situation.

Z scores and p values for displayed pleasant-unpleasant practice and game behaviors, recalled similarly by athletes, are presented in Table 9. According to Table 9, 28 of the 30 nonverbal behaviors had Z scores $\leq$ 1.96; therefore, the null hypothesis (H_o) was tenable for those behaviors. Athletes did recall displayed pleasant-unpleasant behaviors of coaches similarly in both situations. Of the 28 behaviors, athletes tended to describe 15 behaviors as more pleasant in the practice than the game situation, while five behaviors were described as more pleasant in the game situation. Eight behaviors were recalled identically in both situations (see Appendix E, Table B).

Z scores and p values for displayed pleasant-unpleasant practice and game behaviors, recalled differently by athletes, are presented in Table 10.

Table 10

Displayed Pleasant-Unpleasant Practice and Game Behaviors Recalled Differently by Athletes

Item #	Behavior	Z Score	p Value
9	Straight	-2.00	.0456*
11	Hands on hips	-2.65	.0080**

*$p \leq .05$

**$p \leq .01$

According to Table 10, two of the 30 nonverbal behaviors had $\underline{Z}$ scores $\geq$ 1.96; therefore, the alternate hypothesis (H_a) was accepted for those behaviors. Athletes did not recall displayed pleasant-unpleasant behaviors similarly in both situations. The two behaviors, which were found to be significantly different by McNemar's test, included two posture/stance behaviors which can be characterized as "standing-related posture" behaviors (see Appendix B).

Of the two behaviors, 95.24% of the athletes described "straight" as pleasant in the practice situation, while 90.14% described the behavior as pleasant in the game situation (see Appendix E, Table B). "Hands on hips" was described by 52.13% of the athletes as pleasant in the practice situation, and by 39.66% as pleasant in the game situation (see Appendix E, Table B).

After testing each of the null hypotheses, it was found that differences did exist between some of the behaviors of coaches recalled by athletes as displayed-never displayed in the practice and game situations. Of the 30 behaviors, 16, or 53%, were recalled similarly by athletes, while 14, or 47%, were recalled differently by the athletes for the two situations. However, for the displayed instructional-personal, and displayed pleasant-unpleasant categories, few differences existed in the behaviors of coaches as described by athletes for the

practice and game situations. Of the 30 behaviors, 28 behaviors for each of the two nominal scales were described similarly, while two behaviors for each of the two nominal scales were described differently by the athletes for the two situations.

Question 6

Are there differences between selected practice and game observable nonverbal behaviors of coaches as recalled by coaches that are: (a) displayed-never displayed, (b) instructional-personal, and (c) pleasant-unpleasant?

Behavior displayed-never displayed. The null hypothesis (H_o) and the alternate hypothesis (H_a) for the testing of each of the 30 behaviors were as follows.

H_o: Coaches recall the same selected observable nonverbal behaviors for themselves in both practice and game situations that are displayed-never displayed.

H_a: Coaches do not recall the same selected observable nonverbal behaviors for themselves in both practice and game situations that are displayed-never displayed.

Z and p values for displayed-never displayed practice and game behaviors, recalled similarly by coaches are presented in Table 11. According to Table 11, 22 of the 30 nonverbal behaviors had Z scores < 1.96; therefore, the null hypothesis (H_o) was tenable for those behaviors.

Table 11

Displayed-Never Displayed Practice and Game Behaviors Recalled Similarly by Coaches

Item #	Behavior	Z score	p value
1	Smiles	-1.41	.1586
2	Frowns	-1.00	.3174
3	Stares	0.00	1.0000
4	Direct	0.00	1.0000
5	Looks away, up, down, around	.82	.4122
6	Shaking	0.00	1.0000
7	Follows movement	-1.00	.3174
8	Erect	-1.41	.1460
11	Hands on hips	-1.13	.2584
12	Hands in pockets	-1.90	.0578
14	Sits up straight on bench	1.73	.0836
16	Slow	- .70	.4840
17	Pacing	-1.63	.1032
18	Touches shoulder	-1.00	.3174
22	Pats on back	1.73	.0836
23	Pointing	1.41	.1586
24	Directing	- .58	.5620
25	Scratches head	1.00	.3174
26	Clapping	1.41	.1586
28	Runs fingers through hair	1.00	.3174
29	Waves arms up and down	1.00	.3174
30	Uses hands when talking to imitate movement	-1.00	.3174

Minus sign indicates displayed behavior recalled more frequently in the practice situation.

Coaches did recall the same selected observable nonverbal behaviors for themselves in both practice and game situations. As indicated by the negative $\underline{Z}$ scores, 11 of the 22 behaviors were recalled more as displayed in the practice than the game situation, while six of the behaviors tended to be displayed more in the game than the practice situation. Five behaviors were recalled identically. In addition, of the 22 behaviors recalled similarly, 13 behaviors were recalled by over 50% of the coaches as displayed in both practice and game situations, while five behaviors were recalled by over 50% of the coaches as never displayed in the practice and game situations.

$\underline{Z}$ scores and $\underline{p}$ values for displayed-never displayed practice and game behaviors, recalled differently by coaches, are presented in Table 12. Negative $\underline{Z}$ scores indicate that behaviors were more frequently recalled as displayed in the practice situation. Positive $\underline{Z}$ scores indicate that behaviors were more frequently recalled as displayed in the game situation.

According to Table 12, 8 of the 30 nonverbal behaviors had $\underline{Z}$ scores $\geq$ 1.96; therefore, the alternate hypothesis (H_a) was accepted for those behaviors. Coaches did not recall the same selected observable nonverbal behaviors for themselves in both practice and game situations that are displayed-never displayed.

Table 12

Displayed-Never Displayed Practice and Game Behaviors Recalled Differently by Coaches

Item #	Behavior	Z Score	p Value
9	Straight	-2.12	.0340*
10	Legs spread shoulder width	-2.53	.0114*
13	Arms folded	-2.45	.0142*
15	Leans forward while sitting	3.61	.0000**
19	Shakes hand	3.16	.0000**
20	Arm around player	2.24	.0250*
21	Hugs	2.65	.0080**
27	Clenches fists	2.00	.0456*

*$p \leq .05$
**$p \leq .01$

The first three behaviors listed in Table 12 are behaviors that were recalled more frequently as displayed in the practice situation than in the game situation. The behaviors can be characterized as "standing-related posture" behaviors. The last five behaviors listed in Table 12 are behaviors that were recalled more frequently as displayed in the game situation than in the practice situation. The behaviors can be characterized as one "sitting-related posture" behavior, two touching behaviors, and one arm/hand movement (see Tables 3 and 4). The NBDQ (see Appendix B) shows that the eight behaviors, which were found to be significantly different by McNemar's test, were mainly posture/stance and touching behaviors.

Behavior displayed: Instructional-personal. The null hypothesis (H_o) and the alternate hypothesis (H_a) for the testing of each of the 30 behaviors were as follows.

H_o: Coaches recall displayed observable nonverbal behaviors for themselves that are instructional-personal similarly in both practice and game situations.

H_a: Coaches do not recall displayed observable nonverbal behaviors for themselves that are instructional-personal similarly in both practice and game situations.

Z scores and p values for displayed instructional-personal practice and game behaviors, recalled similarly by coaches, are presented in Table 13. According to Table 13, 28 of the 30 nonverbal behaviors had Z scores <1.96; therefore, the null hypothesis (H_o) was tenable for those behaviors. Coaches did recall displayed instructional-personal behaviors for themselves similarly in practice and game situations. Of the 28 displayed instructional-personal behaviors recalled similarly, the coaches described 15 behaviors as more instructional in the practice situation, and three behaviors as more instructional in the game situation. Ten behaviors were described identically by the coaches for the two situations (see Appendix E, Table C).

Z scores and p values for displayed instructional-personal practice and game behaviors, recalled differently

Table 13

Displayed Instructional-Personal Practice and Game Behaviors Recalled Similarly by Coaches

Item #	Behavior	Z score	p value
1	Smiles	- 1.73	.0836
2	Frowns	— .38	.7040
3	Stares	- 1.00	.3174
4	Direct	0.00	1.0000
5	Looks away, up, down, around	— 1.00	.3174
6	Shaking	0.00	1.0000
7	Follows movement	— 1.34	.1802
8	Erect	—1.73	.0836
9	Straight	—1.41	.1586
11	Hands on hips	— .58	.5620
12	Hands in pockets	0.00	1.0000
13	Arms folded	—1.41	.1586
14	Sits up straight on bench	0.00	1.0000
15	Leans forward while sitting	0.00	1.0000
16	Slow	— .58	.5620
17	Pacing	—1.73	.0836
18	Touches shoulder	.82	.4122
19	Shakes hand	— 1.41	.1586
20	Arm around player	— .58	.5620
21	Hugs	—1.41	.1586
23	Pointing	0.00	1.0000
24	Directing	0.00	1.0000
25	Scratches head	0.00	1.0000
26	Clapping	— .45	.6528
27	Clenches fists	1.00	.3174
28	Runs fingers through hair	0.00	1.0000
29	Waves arms up and down	0.00	1.0000
30	Uses hands when talking to imitate movement	1.00	.3174

Minus sign indicates instructional behavior recalled more frequently in the practice situation.

Table 14

Displayed Instructional-Personal Practice and Game Behaviors Recalled Differently by Coaches

Item #	Behavior	Z score	p value
10	Legs spread shoulder width	-2.24	.0250*
22	Pats on back	-2.24	.0250*

*$p \leq .05$

by coaches are presented in Table 14. According to Table 14, two of the 30 nonverbal behaviors had Z scores ≥ 1.96; therefore, the alternate hypothesis (H_a) was accepted for those behaviors. Coaches did not recall displayed instructional-personal behaviors for themselves similarly in both situations. Although both behaviors were more frequently described as personal than instructional, a higher percentage of coaches described the behaviors as personal in the game than in the practice situation (see Appendix E, Table C).

Behavior displayed: Pleasant-unpleasant. The null hypothesis (H_o) and the alternate hypothesis (H_a) for the testing of each of the 30 behaviors were as follows.

H_o: Coaches recall displayed observable nonverbal behaviors for themselves that are pleasant-unpleasant similarly in both practice and game situations.

H_a: Coaches do not recall displayed observable nonverbal behaviors for themselves that are pleasant-unpleasant similarly in both practice and game situations.

Z scores and *p* values for displayed pleasant-unpleasant practice and game behaviors, recalled similarly by coaches, are presented in Table 15. According to Table 15, all of the 30 nonverbal behaviors had *Z* scores < 1.96; therefore, the null hypothesis (H_o) was tenable for those behaviors. Coaches did recall displayed pleasant-unpleasant behaviors for themselves similarly in both practice and game situations. Of the 30 behaviors described similarly in both situations, 11 were described as more pleasant in the practice than the game situation, and two were described as more pleasant in the game than the practice situation (see Appendix E, Table D).

After testing each of the null hypotheses, it was found that differences did exist between the behaviors of coaches recalled by coaches as displayed-never displayed in practice and game situations. Of the 30 behaviors, 22, or 73%, of the behaviors were recalled similarly by the 23 coaches for the two situations, while 8, or 27%, of the behaviors were recalled differently. However, for the displayed instructional-personal behaviors, few differences existed in the behaviors of coaches as described by coaches for the practice and game situations. Of the 30 behaviors, 28 behaviors were described similarly,

Table 15

Displayed Pleasant-Unpleasant Practice and Game Behaviors Recalled Similarly by Coaches

Item #	Behavior	Z score	p value
1	Smiles	0.00	1.0000
2	Frowns	- .58	.5620
3	Stares	- 1.41	.1586
4	Direct	1.00	.3174
5	Looks away, up, down, around	- 1.00	.3174
6	Shaking	- .58	.5620
7	Follows movement	0.00	1.0000
8	Erect	0.00	1.0000
9	Straight	0.00	1.0000
10	Legs spread shoulder width	- 1.00	.3174
11	Hands on hips	- 1.00	.3174
12	Hands in pockets	- 1.00	.3174
13	Arms folded	0.00	1.0000
14	Sits up straight on bench	0.00	1.0000
15	Leans forward while sitting	0.00	1.0000
16	Slow	0.00	1.0000
17	Pacing	0.00	1.0000
18	Touches shoulder	1.00	.3174
19	Shakes hand	0.00	1.0000
20	Arm around player	0.00	1.0000
21	Hugs	0.00	1.0000
22	Pats on back	- 1.00	.3174
23	Pointing	- 1.41	.1586
24	Directing	0.00	1.0000
25	Scratches head	0.00	1.0000
26	Clapping	0.00	1.0000
27	Clenches fists	- 1.00	.3174
28	Runs fingers through hair	- .58	.5620
29	Waves arms up and down	0.00	1.0000
30	Uses hands when talking to imitate movement	0.00	1.0000

Minus sign indicates pleasant behavior recalled more frequently in the practice situation.

while two behaviors were described differently. Displayed pleasant-unpleasant behaviors of coaches were all described similarly by the coaches.

Questions 7 and 8 required a comparison of the behaviors recalled by coaches and athletes first in the practice situation, and then in the game situation. The chi-square test of independence was employed to analyze for the comparisons, and to determine the significance of the differences for behaviors recalled as displayed-never displayed, instructional-personal, and pleasant-unpleasant. The application of the chi-square test required a statement of the null hypothesis with the .05 level of significance as a basis for supporting or rejecting the hypothesis (Daniel, 1978). Therefore, each of the three components of question 7, and of question 8, were stated as null hypotheses. The Statistical Analysis System (Barr et al., 1979) was employed to compute the chi-square scores with 1 df, as well as the probability values. By using the .05 level of significance with 1 df, 3.841 was identified as the critical level for the chi-square values.

Question 7

Are there differences between selected observable nonverbal behaviors of coaches as recalled by athletes and coaches in practice situations that are: (a) displayed-never displayed, (b) instructional-personal, and (c) pleasant-unpleasant?

Behavior displayed-never displayed. The null hypothesis (H_o) and the alternate hypothesis (H_a) for the testing of each of the 30 behaviors were as follows.

H_o: Coaches and athletes recall the same selected observable nonverbal behaviors of coaches that are displayed-never displayed in the practice situation.

H_a: Coaches and athletes do not recall the same selected observable nonverbal behaviors of coaches that are displayed-never displayed in the practice situation.

Chi-square results and p values for displayed-never displayed practice behaviors, recalled similarly by coaches and athletes, are presented in Table 16. According to Table 16, 28 of the 30 nonverbal behaviors had chi-square values < 3.841; therefore, the null hypothesis (H_o) was tenable for those behaviors. Coaches and athletes did recall the same selected observable nonverbal behaviors of coaches that are displayed-never displayed in the practice situation. Of the 28 behaviors, 50% of the athletes and 50% of the coaches recalled 14 behaviors as displayed, and 10 behaviors as never displayed. Four behaviors were noted to be different by the two groups; however, the difference was not significant (see Tables 1 and 3).

Chi-square results and p values for displayed-never displayed practice behaviors, recalled differently by coaches and athletes, are presented in Table 17.

Table 16

Displaced Practice-Never Displayed Behaviors
Recalled Similarly by Coaches and Athletes

Item #	Behavior	chi-square	p value
1	Smiles	1.436	.2308
2	Frowns	3.374	.0662
3	Stares	.328	.5671
4	Direct	.409	.5225
5	Looks away, up, down, around	.001	.9818
6	Shaking	3.048	.0808
8	Erect	.317	.5735
9	Straight	.958	.3277
10	Legs spread shoulder width	.600	.4387
11	Hands on hips	.001	.9818
12	Hands in pockets	.757	.3842
14	Sits up straight on bench	.252	.6156
15	Leans forward while sitting	1.759	.1847
16	Slow	1.470	.2253
17	Pacing	1.759	.1847
18	Touches shoulder	.534	.4648
19	Shakes hand	.481	.4878
20	Arm around player	.070	.7909
21	Hugs	.029	.8639
22	Pats on back	1.276	.2587
23	Pointing	.738	.3904
24	Directing	.456	.4996
25	Scratches head	.335	.5625
26	Clapping	.994	.3187
27	Clenches fists	.180	.6714
28	Runs fingers through hair	.025	.8755
29	Waves arms up and down	.434	.5098
30	Uses hands when talking to imitate movement	.779	.3773

Table 17

Displayed-Never Displayed Practice Behaviors Recalled Differently by Coaches and Athletes

Item #	Behavior	chi-square	p value
7	Follows movement	4.022	.0449*
13	Arms folded	4.504	.0338*

*$p \leq .05$

According to Table 17, two of the 30 behaviors had chi-square values ≥ 3.841; therefore, the alternate hypothesis (H_a) was accepted for those behaviors. Displayed-never displayed practice behaviors were recalled differently by coaches and athletes.

The behaviors recalled differently consisted of one head movement, and one posture/stance movement (see Appendix B). The two behaviors, although recalled by the coaches and athletes as being displayed in the practice situation, were recalled by a higher percentage of the coaches than the athletes as behaviors displayed in the practice situation (see Tables 1 and 3).

Behavior displayed: Instructional-personal. The null hypothesis (H_o) and the alternate hypothesis (H_a) for the testing of each of the 30 behaviors were as follows.

H_o: Coaches and athletes recall displayed observable nonverbal behaviors of coaches that are instructional-personal similarly in the practice situation.

H_a: Coaches and athletes do not recall displayed observable nonverbal behaviors of coaches that are instructional-personal similarly in the practice situation.

Chi-square results and p values for displayed instructional-personal practice behaviors, recalled similarly by coaches and athletes, are presented in Table 18. According to Table 18, 24 of the 30 nonverbal behaviors had chi-square values < 3.841; therefore, the null hypothesis (H_o) was tenable for those behaviors. Displayed instructional-personal practice behaviors of coaches were recalled similarly by coaches and athletes. Of the 24 displayed behaviors recalled similarly, 12 were described by over 50% of both groups as instructional, and four were described by over 50% of both groups as personal. Eight behaviors were recalled differently by the two groups; however, the differences were not significant (see Appendix E, Tables A and C). The 12 behaviors, described as instructional, consisted of three eye contact, two head motion, two posture/stance, and five arm/hand behaviors. Personal behaviors consisted of one face, one posture/stance, one touching, and one arm/hand behavior (see Appendix B).

Table 18

Displayed Instructional-Personal Practice Behaviors Recalled Similarly by Coaches and Athletes

Item #	Behavior	chi-square	p value
1	Smiles	.067	.7962
3	Stares	.015	.9010
4	Direct	.234	.6286
5	Looks away, up, down, around	.003	.9531
6	Shaking	.662	.4157
7	Follows movement	2.479	.1153
8	Erect	.050	.8229
9	Straight	1.277	.2584
10	Legs spread shoulder width	.000	.9949
11	Hands on hips	1.043	.3072
14	Sits up straight on bench	.778	.3778
16	Slow	1.130	.2877
18	Touches shoulder	2.306	.1289
19	Shakes hand	.173	.6774
20	Arm around player	.192	.6615
21	Hugs	1.556	.2123
22	Pats on back	1.544	.2140
23	Pointing	.556	.4557
24	Directing	1.069	.3011
26	Clapping	.003	.9543
27	Clenches fists	1.168	.2800
28	Runs fingers through hair	2.485	.1149
29	Waves arms up and down	2.675	.1020
30	Uses hands when talking to imitate movement	.000	.9852

Chi-square results and p values for displayed instructional-personal practice behaviors, recalled differently by coaches and athletes, are presented in Table 19. According to Table 19, six of the 30 nonverbal behaviors had chi-square values ≥ 3.841; therefore, the alternate hypothesis (H_a) was accepted for those behaviors. Displayed instructional-personal practice behaviors of coaches were recalled differently by athletes and coaches. Of the six displayed practice behaviors recalled differently, athletes described "frowns," "leans forward while sitting," and "pacing" as instructional, while coaches described the behaviors as personal. The remaining three behaviors, i.e., "hands in pockets," "arms folded," and "scratches head," were described by both groups as personal; however, a higher percentage of coaches than athletes described the behaviors as personal (see Appendix E, Tables A and C).

Behavior displayed: Pleasant-unpleasant. The null hypothesis (H_o) and the alternate hypothesis (H_a) for the testing of each of the 30 behaviors were as follows.

H_o: Coaches and athletes recall displayed observable nonverbal behaviors of coaches that are pleasant-unpleasant similarly in the practice situation.

Table 19

Displayed Instructional-Personal Practice Behaviors Recalled Differently by Coaches and Athletes

Item #	Behavior	chi-square	p value
2	Frowns	4.684	.0304*
12	Hands in pockets	4.063	.0438*
13	Arms folded	5.035	.0248*
15	Leans forward while sitting	7.001	.0081**
17	Pacing	6.238	.0125*
25	Scratches head	5.520	.0188*

*$p \leq .05$
**$p \leq .01$

H_a: Coaches and athletes do not recall displayed observable nonverbal behaviors of coaches that are pleasant-unpleasant similarly in the practice situation.

Chi-square results and p values for displayed pleasant-unpleasant practice behaviors, recalled similarly by coaches and athletes, are presented in Table 20. According to Table 20, 28 of the 30 nonverbal behaviors had chi-square values <3.841; therefore, the null hypothesis (H_o) was tenable for those behaviors. Coaches and athletes did recall displayed pleasant-unpleasant practice behaviors of coaches similarly. Over 50% of the coaches and over 50% of the athletes described 24 of the 28 behaviors as pleasant, and three of the behaviors as unpleasant. One behavior was noted as different by the two groups; however,

Table 20

Displayed Pleasant-Unpleasant Practice Behaviors
Recalled Similarly by Coaches and Athletes

Item #	Behavior	chi-square	p value
1	Smiles	.217	.6416
2	Frowns	.854	.3555
3	Stares	.168	.6821
4	Direct	.578	.4472
5	Looks away, up, down, around	2.656	.1032
6	Shaking	.773	.3793
7	Follows movement	.229	.6325
8	Erect	1.360	.2436
9	Straight	.020	.8875
10	Legs spread shoulder width	.685	.4080
11	Hands on hips	1.254	.2627
13	Arms folded	3.582	.0584
14	Sits up straight on bench	1.909	.1671
15	Leans forward while sitting	.001	.9744
16	Slow	3.188	.0742
17	Pacing	1.119	.2902
18	Touches shoulder	.011	.9158
19	Shakes hand	.161	.6886
20	Arm around player	.928	.3353
21	Hugs	.419	.5174
22	Pats on back	.473	.4917
23	Pointing	.354	.5517
24	Directing	1.762	.1844
25	Scratches head	.064	.8002
26	Clapping	.230	.6314
28	Runs fingers through hair	.168	.6817
29	Waves arms up and down	.623	.4300
30	Uses hands when talking to imitate movement	.295	.5871

the difference was not significant (see Appendix E, Tables B and D).

Chi-square results and p values for displayed pleasant-unpleasant practice behaviors, recalled differently by coaches and athletes, are presented in Table 21. According to Table 21, two of the 30 nonverbal

Table 21

Displayed Pleasant-Unpleasant Practice Behaviors Recalled Differently by Coaches and Athletes

Item #	Behavior	chi-square	p value
12	Hands in pockets	6.232	.0125*
27	Clenches fists	5.180	.0228*

*$p \leq .05$

behaviors had chi-square values ≥ 3.841; therefore, the alternate hypothesis (H_a) was accepted for those behaviors. Coaches and athletes did not recall displayed pleasant-unpleasant practice behaviors of coaches similarly. Of the two behaviors recalled differently, both the athletes and the coaches described "hands in pockets" as pleasant; however, a higher percentage of coaches than the athletes described the behavior as pleasant. The second behavior, "clenches fists," was described by coaches to be pleasant,

while athletes described the behavior as unpleasant (see Appendix E, Tables B and D).

After testing each of the null hypotheses (H_o), it was found that differences do exist between the displayed behaviors of coaches that were described by the coaches and by the athletes as instructional-personal in the practice situation. Of the 30 behaviors, 24 of the behaviors were described similarly, while six behaviors were described differently by the two groups. However, few differences existed in practice behaviors of coaches recalled as displayed-never displayed, as well as described as pleasant-unpleasant by the coaches and by the athletes. Of the 30 behaviors, 28 behaviors in each of the two nominal scales were recalled and described similarly, while two behaviors were recalled and described differently by the two groups.

Question 8

Are there differences between selected observable nonverbal behaviors of coaches as recalled by athletes and coaches in game situations that are: (a) displayed-never displayed, (b) instructional-personal, and (c) pleasant-unpleasant?

Behavior displayed-never displayed. The null hypothesis (H_o) and the alternate hypothesis (H_a) for the testing of each of the 30 behaviors were as follows.

H_o: Coaches and athletes recall the same selected observable nonverbal behaviors of coaches that are displayed-never displayed in the game situation.

H_a: Coaches and athletes do not recall the same selected observable nonverbal behaviors of coaches that are displayed-never displayed in the game situation.

Chi-square results and p values for displayed-never displayed game behaviors, recalled similarly by coaches and athletes, are presented in Table 22. According to Table 22, the null hypothesis (H_o) was tenable for all 30 behaviors. Coaches and athletes did recall displayed-never displayed game behaviors of coaches similarly. Of the 30 behaviors recalled similarly, over 50% of the athletes and over 50% of the coaches recalled 17 behaviors as displayed, and 10 behaviors as never displayed. Coaches and athletes recalled three behaviors differently; however, the differences were not significant (see Tables 2 and 4).

Behavior displayed: Instructional-personal. The null hypothesis (H_o) and the alternate hypothesis (H_a) for the testing of each of the 30 behaviors were as follows.

H_o: Coaches and athletes recall displayed observable nonverbal behaviors of coaches that are instructional-personal similarly in the game situation.

H_a: Coaches and athletes do not recall displayed observable nonverbal behaviors of coaches that are instructional-personal similarly in the game situation.

Table 22

Displayed-Never Displayed Game Behaviors Recalled Similarly by Coaches and Athletes

Item #	Behavior	chi-square	p value
1	Smiles	.293	.5884
2	Frowns	2.371	.1236
3	Stares	.003	.9584
4	Direct	.001	.9723
5	Looks away, up, down, around	2.239	.1345
6	Shaking	2.570	.1089
7	Follows movement	2.185	.1394
8	Erect	.508	.4759
9	Straight	.514	.4734
10	Legs spread shoulder width	2.203	.1377
11	Hands on hips	.418	.5179
12	Hands in pockets	.392	.5315
13	Arms folded	.191	.6620
14	Sits up straight on bench	1.566	.2108
15	Leans forward while sitting	2.411	.1205
16	Slow	2.657	.1031
17	Pacing	.122	.7264
18	Touches shoulder	.025	.8755
19	Shakes hand	1.248	.2640
20	Arm around player	1.928	.1649
21	Hugs	2.185	.1393
22	Pats on back	1.339	.2473
23	Pointing	.833	.3614
24	Directing	.409	.5225
25	Scratches head	.164	.6857
26	Clapping	.025	.8738
27	Clenches fists	.231	.6308
28	Runs fingers through hair	.000	.9944
29	Waves arms up and down	.261	.6091
30	Uses hands when talking to imitate movement	.009	.9243

Chi-square results and p values for displayed instructional-personal game behaviors, recalled similarly by coaches and athletes, are presented in Table 23. According to Table 23, 18 of the 30 behaviors had chi-square values ≤ 3.841; therefore, the null hypothesis (H_o) was tenable for those behaviors. Coaches and athletes did recall displayed instructional-personal game behaviors of coaches similarly. Of the 18 behaviors recalled similarly, over 50% of the coaches and over 50% of the athletes described eight behaviors as instructional, and eight behaviors as personal. Two behaviors were noted as different by the two groups, but the differences were not significant (see Appendix E, Tables A and C). The instructional behaviors described similarly consisted of one eye, one head, one touch, and five arm/hand behaviors, while the personal behaviors consisted of one eye, three posture/stance, two touch and two arm/hand behaviors (see Appendix B).

Chi-square results and p values for displayed instructional-personal game behaviors, recalled differently by coaches and athletes, are presented in Table 24. According to Table 24, 12 of the 30 nonverbal behaviors had chi-square values ≥ 3.841; therefore, the alternate hypothesis (H_a) was accepted for those behaviors. Coaches and athletes did not recall displayed instructional-personal game behaviors of coaches similarly.

Table 23

Displayed Instructional-Personal Game Behaviors
Recalled Similarly by Coaches and Athletes

Item #	Behavior	chi-square	p value
1	Smiles	2.464	.1165
3	Stares	1.477	.2243
4	Direct	.956	.3282
5	Looks away, up, down, around	2.931	.0869
6	Shaking	.333	.5641
8	Erect	1.814	.1780
11	Hands on hips	2.596	.1071
14	Sits up straight on bench	2.719	.0992
18	Touches shoulder	.000	.9909
20	Arm around player	.369	.5437
21	Hugs	1.662	.1974
23	Pointing	.431	.5113
24	Directing	.210	.6471
26	Clapping	.686	.4076
27	Clenches fists	.702	.4072
28	Runs fingers through hair	3.360	.0668
29	Waves arms up and down	.056	.8129
30	Uses hands when talking to imitate movement	.826	.3634

Table 24

Displayed Instructional-Personal Game Behaviors Recalled Differently by Coaches and Athletes

Item #	Behaviors	chi-square	p values
2	Frowns	3.811	.0500*
7	Follows movement	4.063	.0438*
9	Straight	4.607	.0318*
10	Legs spread shoulder width	10.200	.0014**
12	Hands in pockets	4.098	.0429*
13	Arms folded	8.912	.0028**
15	Leans forward while sitting	9.519	.0020**
16	Slow	4.974	.0257*
17	Pacing	6.615	.0101**
19	Shakes hand	5.530	.0187*
22	Pats on back	4.716	.0299*
25	Scratches Head	6.426	.0112*

*$p \leq .05$
**$p \leq .01$

The 12 behaviors, found to be significantly different, are displayed by percentages in Figure 1. Figure 1 shows, for example, that "follows movement" (7) was described by approximately 89% of the athletes and 71% of the coaches as instructional. The same behavior was described by approximately 11% of the athletes and 29% of the coaches as personal. Therefore, according to Figure 1, behaviors 9, 10, 12, 13, 16, 17, 19, 22, and 25 were described as personal by a majority of the coaches. A majority of the athletes described five of those behaviors

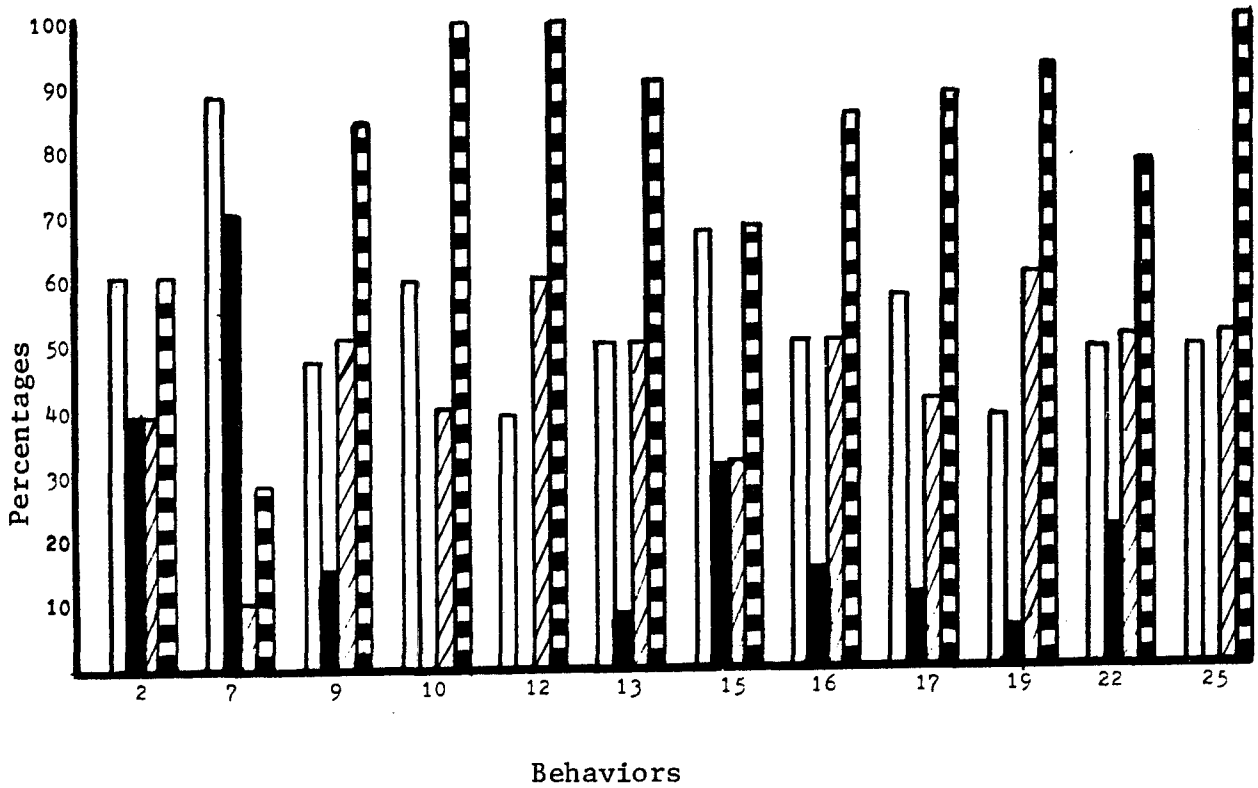

Figure 1. Significantly different game behaviors that are instructional-personal.

as personal, but with lower percentages than reported by the coaches. Those behaviors were "straight" (9), "hands in pockets" (12), "shakes hand" (19), "pats on back" (22), and "scratches head" (25). Of the remaining four behaviors that a majority of the coaches described as personal, two were described as instructional by a majority of the athletes, i.e., "legs spread shoulder width" (10), and "pacing" (17). Fifty percent of the athletes described the last two behaviors, i.e., "arms folded" (13), and "slow" (16), as instructional, and 50% of the athletes described those behaviors as personal.

In addition, Figure 1 shows that two of the 12 behaviors were described as instructional by a majority of the athletes, while a majority of the coaches described those behaviors as personal. The behaviors were "frowns" (2), and "leans forward while sitting" (15).

Finally, the remaining behavior, "follows movement" (7), was described as instructional by both coaches and athletes; however, a higher percentage of athletes than of coaches described the behavior as instructional.

The 12 behaviors shown in Figure 1 are characterized as mainly "standing-related postures," walking and touching behaviors.

Behavior displayed: Pleasant-unpleasant. The null hypothesis (H_o) and the alternate hypothesis (H_a) for the testing of each of the 30 behaviors were as follows.

H_o: Coaches and athletes recall displayed observable nonverbal behaviors of coaches that are pleasant-unpleasant similarly in the game situation.

H_a: Coaches and athletes do not recall displayed observable nonverbal behaviors of coaches that are pleasant-unpleasant similarly in the game situation.

Chi-square results and p values for displayed pleasant-unpleasant game behaviors, recalled similarly by coaches and athletes, are presented in Table 25.

According to Table 25, 29 of the 30 nonverbal behaviors had chi-square values <3.841; therefore, the null hypothesis (H_o) was tenable for those behaviors. Coaches and athletes did recall displayed pleasant-unpleasant game behaviors of coaches similarly. Of the 29 behaviors, over 50% of the athletes and over 50% of the coaches described 22 behaviors as pleasant, and six behaviors as unpleasant. Coaches and athletes described one behavior differently, but the difference was not significant (see Appendix E, Tables B and D).

Chi-square results and p values for displayed pleasant-unpleasant game behaviors, recalled differently by coaches and athletes, are presented in Table 26. According to Table 26, one of the 30 behaviors had a chi-square value ≥ 3.841; therefore, the alternate hypothesis (H_a) was accepted for that behavior. Coaches and athletes did

Table 25

Displayed Pleasant-Unpleasant Game Behaviors
Recalled Similarly by Coaches and Athletes

Item #	Behavior	chi-square	p value
1	Smiles	.834	.3610
2	Frowns	2.135	.1440
3	Stares	2.188	.1391
4	Direct	.768	.3808
5	Looks away, up, down, around	.223	.6368
6	Shaking	.830	.3622
7	Follows movement	.970	.3248
8	Erect	1.464	.2264
9	Straight	1.398	.2370
10	Legs spread shoulder width	.068	.7947
11	Hands on hips	1.443	.2296
12	Hands in pockets	.307	.5794
13	Arms folded	2.339	.1262
14	Sits up straight on bench	1.309	.2526
15	Leans forward while sitting	.133	.7154
16	Slow	1.805	.1791
17	Pacing	.336	.5622
18	Touches shoulder	1.297	.2547
19	Shakes hand	.253	.6147
20	Arm around player	2.358	.1247
21	Hugs	1.081	.2985
22	Pats on back	.462	.4965
23	Pointing	.443	.5058
24	Directing	.902	.3423
25	Scratches head	.185	.6669
26	Clapping	.407	.5236
28	Runs fingers through hair	.700	.4028
29	Waves arms up and down	.287	.5919
30	Uses hands when talking to imitate movement	.053	.8177

Table 26

Displayed Pleasant-Unpleasant Game Behaviors Recalled Differently by Coaches and Athletes

Item #	Behaviors	chi-square	p value
27	Clenches fists	7.804	.0052**

**$p \leq .01$

not recall "clenches fists" similarly as pleasant-unpleasant in the game situation.

The one behavior, found to be significantly different, was described by 88% of the athletes as unpleasant. Fifty percent of the coaches described the behavior as pleasant, while 50% of the coaches described the behavior as unpleasant (see Appendix E, Tables B and D).

After testing each of the null hypotheses (H_o), it was found that differences do exist between the displayed behaviors of coaches that were described by the coaches and by the athletes as instructional-personal in the game situation. Of the 30 behaviors, 18 of the behaviors were described similarly by the two groups, while 12 of the behaviors were described differently. However, few differences existed in game behaviors of coaches described as pleasant-unpleasant by the coaches and by the athletes. Of the 30 behaviors, 29 behaviors were described similarly, while one behavior was

described differently by the two groups. The athletes and coaches recalled all displayed-never displayed behaviors similarly.

Question 9

Do individual coaches recall selected observable nonverbal behaviors identical to those recalled by their athletes?

Of the 27 teams, which responded to the NBDQ, only 13 teams, each consisting of one coach and five athletes, completed and returned all of their questionnaires to the investigator; therefore, the data for the 30 nonverbal behaviors, displayed-never displayed in both the practice and in the game situations for question 9, represent only 13 of the 27 teams which participated in the study.

To determine the total number of identical behaviors that were recalled by coaches and their athletes, both the behaviors that were checked displayed, as well as those checked never displayed were reviewed. In order to compare the otherwise noncomparable numbers, a recall ratio was established. Ratios can be used to relate one number to another, and they sometimes give more accurate information than the parts of which they are composed (Kerlinger, 1973). It was possible to generate six ratios for the practice situation and six for the game situation. Coach recall of a behavior was the constant to which five athletes' recall

of the same behavior was compared. Therefore, the ratio 1:5 indicated that all five athletes agreed with their coach on the recall of a specific behavior, whereas a ratio of 1:0 indicated that none of the athletes agreed with their coach.

The total number of behaviors for each recall ratio was determined. Those totals are represented in Table 27 under each recall ratio. The table shows, for example, for Team A that only one behavior, listed under the 1:5 ratio, was recorded as recalled identically by the coach and by the five athletes working with that coach in the practice situation. Continuing across the line, Team A recorded 14 behaviors, listed under the 1:4 recall ratio, as recalled identically by the coach and by four of the athletes. Under the 1:0 recall ratio, no behaviors were listed for Team A; therefore, there were no behaviors recorded in which all five athletes disagreed with their coach. In the game situation, Team A recorded six behaviors, listed under the 1:5 recall ratio, as recalled identically by the coach and five athletes. Furthermore, under the 1:0 recall ratio, one behavior was recorded in which all five athletes on Team A disagreed with their coach.

According to the figures in Table 27, the highest identical practice situation behavior recall can be seen for Team F. Of the 30 behaviors, 13 were recalled identically by the one coach and five athletes of Team F.

Table 27

Coach and Athlete Identical Recall of Displayed-Never Displayed Behaviors

Team[a]	Practice Situation Ratios[b]						Game Situation Ratios[b]					
	1:5	1:4	1:3	1:2	1:1	1:0	1:5	1:4	1:3	1:2	1:1	1:0
A	1	14	8	4	3	0	6	8	10	4	1	1
B	10	4	4	4	6	2	7	4	6	4	7	2
C	11	3	5	5	5	1	12	5	3	4	5	1
D	7	2	10	9	2	0	7	9	7	4	3	0
E	9	7	4	5	4	1	8	8	8	3	1	2
F	13	7	4	3	2	1	9	7	4	1	5	4
G	9	10	5	3	1	2	4	9	12	3	2	0
H	4	8	7	6	2	3	3	5	9	8	3	2
I	7	7	7	5	3	1	7	13	4	5	0	1
J	6	5	11	6	2	0	5	6	8	8	3	0
K	12	11	3	1	0	3	16	5	0	3	2	4
L	5	5	5	10	3	2	6	10	6	6	2	0
M	4	6	9	6	5	0	3	7	7	9	2	2

Note. The figures listed under each of the six recall ratios represent the total number of identical behaviors reported by coaches and their athletes for that ratio.

[a]The letter used to identify the 13 complete teams is differentiated from the team code listing in Appendix C.

[b]A higher ratio indicates more athletes recalled a behavior identical to that of their coach.

In contrast, the lowest identical practice situation behavior recall can be seen for Team A. Of the 30 behaviors, one was recalled identically by the one coach and five athletes of Team A.

In the game situation, the highest identical behavior recall may be seen for Team K. Team K recalled identically 16 of the 30 behaviors. On the other hand, the lowest identical behavior recall was recorded for Teams H and M. Of the 30 behaviors, Teams H and M recalled only three behaviors identically.

For the practice situation, eight of the 13 teams showed total agreement between the coach and the players in the recall of four to nine behaviors. For the game situation, 11 of the 13 teams showed total agreement between the coach and the players in the recall of three to nine behaviors. Overall, of the 30 practice behaviors, one to 13 were recalled identically by a coach and her five athletes, while in the game situation, three to 16 behaviors were recalled identically.

Summary

The main findings from the analysis of the framing questions of the investigation were as follows.

1. Nonverbal behaviors most frequently recalled by athletes as displayed by their respective coaches in the practice situation included "smiles," "direct,"

"follows movement," "directing," "pointing," and "uses hands when talking to imitate movement." The nonverbal behaviors were characterized as movements of the face, eyes, head, and arm/hand.

2. Nonverbal behaviors most frequently recalled by athletes as displayed by their respective coaches in the game situation included "smiles," "direct," "follows movement," "directing," "pointing," "uses hands when talking to imitate movement," "pats on back," "clapping," and "leans forward while sitting." The nonverbal behaviors were characterized as posture and touch, as well as movements of the face, eyes, head, and arm/hand.

3. In the practice situation, ten nonverbal behaviors were most frequently recalled by coaches. Six of those behaviors were recalled also by the athletes. The behaviors were characterized as posture and touch, as well as movements of the face, eyes, head, and arm/hand.

4. In the game situation, ten nonverbal behaviors were most frequently recalled by coaches. Nine of those behaviors were recalled also by the athletes. The behaviors were characterized as posture and touch, as well as movements of the face, eyes, head, and arm/hand.

5. Athletes showed differences in recalled displayed-never displayed behaviors of coaches in the

practice and game situations. Although 16 of the 30 practice and game behaviors were recalled similarly, 14 were recalled differently by the athletes for the two situations. However, few differences existed in the displayed practice and game behaviors of coaches that athletes described as instructional-personal, and pleasant-unpleasant. Of the 30 behaviors, 28 behaviors for each of the two nominal scales were described similarly, while two behaviors were described differently by the athletes for the two situations.

6. Coaches showed differences in recalled displayed-never displayed behaviors of coaches in the practice and game situations. Although 24 of the 30 practice and game behaviors were recalled similarly, six were recalled differently by the coaches for the two situations. However, few differences existed in the displayed practice and game behaviors of coaches that coaches described as instructional-personal. Of the 30 behaviors, 28 were described similarly, while two behaviors were described differently by the coaches for the two situations. Finally, displayed practice and game behaviors, that coaches described as pleasant-unpleasant, were all described similarly by the coaches for the two situations.

7. Differences did exist between the displayed behaviors of coaches that were described by the coaches and by the athletes as instructional-personal in the

practice situation. Of the 30 behaviors, 24 of the behaviors were described similarly, while 6 of the behaviors were described differently by the two groups. However, few differences existed in the practice behaviors of coaches recalled as displayed-never displayed, as well as described as pleasant-unpleasant by the coaches and by the athletes. Of the 30 behaviors, 28 behaviors for the two nominal scales were recalled and described similarly, while two behaviors were recalled and described differently by the two groups.

8. Differences did exist between the displayed behaviors of coaches that were described by the coaches and by the athletes as instructional-personal in the game situation. Of the 30 behaviors, 18 of the behaviors were described similarly by the two groups, while 12 behaviors were described differently. However, few differences existed in game behaviors of coaches described as pleasant-unpleasant by the coaches and by the athletes. Of the 30 behaviors, 29 behaviors were described similarly, while one behavior was described differently by the two groups. The athletes and coaches recalled all displayed-never displayed game behaviors similarly.

9. Of the 30 practice situation behaviors, one to 13 behaviors were recalled identically by individual coaches and five of their athletes. Of the 30 game behaviors, three to 16 game situation behaviors were recalled identically by individual coaches and five of their athletes.

Reliability

The test-retest reliability of the NBDQ was established concurrent to its use in the study. The questionnaire was completed by six coaches and 28 athletes on two separate occasions three to eight days apart. The nominal nature of the data recorded for the NBDQ required the application of a percentage of agreement formula. Good and Brophy's (1973) formula (i.e., percentage of agreement = agreement/total decisions) was selected and adjusted.

Using Good and Brophy's (1973) formula of percentage of agreement, scores were computed for each of the six categories of the NBDQ. Computations of the percentage figures for both practice and game situation behaviors were determined by the following procedure. First, the test and retest categories of behavior displayed-never displayed were compared. Any change in the retest categories checked were noted (e.g., if smile was checked displayed on the test, and on the retest smile was checked never displayed, it was noted). To arrive at the percentage of agreement, the retest frequency was divided by the test frequency, which was 30, representing the number of behaviors on the scale. Good and Brophy's (1973) formula was adjusted and expressed

as: percentage of agreement = retest agreement (30 behaviors on test - # of changes) / test (30 behaviors).

Second, if a behavior was checked as displayed, the subjects were asked to classify the behavior as instructional or personal, and pleasant or unpleasant. The original test items checked were compared to the identical items on the retest questionnaire. Percentage of agreement was the retest frequency divided by the test frequency. The formula was expressed as: percentage of agreement = retest (original items checked - # of changes) / test (original items checked).

Table 28 shows the percentage of agreement figures for the six NBDQ categories. The figures listed all exceed .70 which is the reliability measure selected by most investigators as adequate; therefore, the three nominal scales listed on the NBDQ for both practice and game situations have adequate reliability.

According to Table 28, the 34 participants were more consistent on the test-retest when they described behaviors as displayed-never displayed, and pleasant-unpleasant in the game than the practice situation, whereas in describing behaviors as instructional-personal, they were more consistent in the practice than the game situation. Moreover, relevant to the nominal scales, the participants were most consistent when they described

Table 28

Average Percentage of Agreement Scores for NBDQ Categories

NBDQ Categories	Percentage of Agreement	
	Game Situation	Practice Situation
Displayed-never displayed	83.94%	81.63%
Instructional-personal	78.94%	81.60%
Pleasant-unpleasant	92.56%	90.00%

Note. The figures listed in Table 28 represent the average percentage of agreement scores for the 34 participants (i.e., 6 coaches and 28 athletes) on the NBDQ test-retest.

behaviors as pleasant-unpleasant in both the game and the practice situations (i.e., reliability ranged between 90.00-92.56%). They were least consistent when they described behaviors as instructional-personal in both the game and practice situations (i.e., reliability ranged between 78.94-81.60%).

In addition to computing the percentage of agreement scores for the three nominal scales, listed for both practice and game situations on the NBDQ, an average percentage of agreement score for the total questionnaire was computed for the teams, coaches, and athletes. To arrive at these scores, the following procedure was followed. First, a percentage of agreement score for each participant's questionnaire was computed. In order to arrive at the percentage of agreement score for each questionnaire,

the six percentage of agreement scores, determined previously for the three nominal scales of both the practice and game situations, were summed; thereafter, the total was divided by six. Second, team average, coach average, and athlete averages were computed by adding individual questionnaire percentage of agreement scores for each group, and dividing by the number in that group.

The figures listed in Table 29 represent the group average for the total questionnaire. According to

Table 29

Average Percentage of Agreement Scores for Total NBDQ

Group	N	Percentage of Agreement
Team	6	84.86%
Coach	6	86.18%
Athletes	28	84.48%

the table, the average percentage of agreement scores for the total NBDQ for the three groups vary between 84.48% and 86.18%. Coaches were slightly more consistent on their responses than were athletes by 1.7%.

In summary, the reliability of the NBDQ ranges between 84-87%. Fluctuation exists between the three nominal scales on the NBDQ. Pleasant-unpleasant had

reliability percentages between 90.00-92.56%, instructional-personal between 78.94% and 81.94%, and displayed-never displayed reliability ranged between 81.63% and 83.94%. According to most investigators, the reliability figures, listed for the NBDQ, would be more than adequate.

Discussion

The analyses of the questions posed for the investigation indicate that athletes and coaches do recall selected observable nonverbal behaviors of collegiate female varsity volleyball and basketball coaches in practice and game situations that are: (a) displayed-never displayed, (b) instructional-personal, and (c) pleasant-unpleasant. Moreover, the present data show many similarities as well as many discrepancies in practice and game behaviors recalled by athletes and coaches.

Similarities were noted among the coaches and athletes for practice and game behaviors recalled as displayed-never displayed, and described as pleasant-unpleasant. Little evidence exists in nonverbal literature as to why coaches and athletes recalled and described the behaviors similarly; thus it is conjectured that coaches and athletes did, in fact, see the same behaviors displayed, and recalled them accordingly. On the other hand, culture or socialization might have patterned some of the responses. Investigators (Birdwhistell, 1970; Cratty, 1973) note that members of a group tend to possess similar orientations; therefore, those members might respond to and describe stimuli similarly. In addition, Harrison (1972) states that many responses to stimuli have been conditioned because cultural information is "packaged informally" (e.g., movies, T.V., mass media, modeling). Frequently, such informal packaging establishes future

communication patterns. With the increased use of visual media in athletics, nonverbal behaviors such as "pats on back" and "shakes hand" may be an informal package which has the potential for establishing future communication patterns. Finally, another explanation as to why coaches and athletes responded similarly could be their expectation of the behaviors in the situations. According to Good and Brophy (1973), expectations affect perception, thus individuals notice and interpret what they expect. Moreover, expectations could also be a contributing factor to the existing discrepancies that were demonstrated by coaches and athletes.

One discrepancy reported exists in the recall of practice and game displayed-never displayed behaviors by coaches and athletes. The discrepancies, reported by both groups, showed that more "standing-related posture" behaviors were noted for the practice situation, while more "sitting-related" postures and touching behaviors were cited for the game situation. It is not difficult to speculate why the differences exist in the displayed behavior patterns. Usually, in practice situations, coaches are standing or moving when giving instructions, while during game situations, rules for volleyball and basketball dictate that coaches sit or stand within a confined area. Furthermore, touching behaviors (e.g., "shakes hand"), according to Smith et al. (1977), are reactive behaviors which encourage or reward an athletes' performance, and seem to be used in the game situation.

A second discrepancy noted exists in coach-athlete comparisons of displayed behaviors described as instructional-personal for practice and game situations. In general, athletes described the displayed behaviors as more instructional for both situations, while coaches described a majority of the behaviors in both situations as personal. Apparently athletes do observe nonverbal behaviors in situations in which directions for learning and performance are being given, and they describe those behaviors accordingly. In contrast, coaches consider those same behaviors as gestures that are not related to directions given for learning or performance. This observed dichotomy could be what Good and Brophy (1973) term "lack of awareness" on the teacher's part in understanding specific nonverbal teaching behaviors. On the other hand, it might be the result of the coach and athlete relationship to the practice and game situations. Athletes actively participate in both practice and game situations, while coaches instruct. According to Clark and Creswell (1978), participants and nonparticipants both observe the nonverbal but interpret it differently because of their relationship to the situation. One last explanation for the existing discrepancies could be that coaches do not consider the game situation instructional, while athletes do.

Other findings of the data suggest that individual coaches do not recall behaviors identical to those recalled by their athletes. This finding supports Percival's position

(1971) in which, although he examined coaching leadership qualities, he stated that his own self-perceptions, as a coach, were incongruent with those of his athletes.

In addition, the data reported support and lent credence to many of the behaviors included on interactional analysis systems or observational instruments developed for general education (Amidon, 1971; Grant & Hennings, 1971), and physical education (Cheffers, 1974; Smith et al., 1977). Although the behaviors are listed in the systems under categories somewhat different from the categories on the NBDQ, they do appear in both the systems and the NBDQ. For example, "smiles" is listed under the category of praise, in those instruments developed from FIAS or CAFIAS, while Grant and Hennings (1971) list "smiles" as an instructional-conducting behavior. Grant and Hennings also list "frowns" under criticism. Smith et al. (1977) describe "frowns" and "smiles" as reactive behaviors which are elicited behaviors that occur in response to a preceding action.

Finally, overall the data reported showed that both athletes and coaches recalled most of the 30 behaviors more frequently in the game than in the practice situation. A possible explanation for that difference might be that fewer people are active during the game situation; thus, observation is facilitated over a longer period of time. Added to that condition is the proximity of the inactive players to the coach during periods of nonplay. In

contrast, Hall et al. (1977) might argue that athletes vary in their sensitivity to displayed nonverbal behaviors; therefore, if sensitivity of athletes were low, increased "sitting-time," as well as proximity to displayed coach behaviors, would have no effect on the number of behaviors recalled.

Finally, the behaviors recalled by the athletes and coaches describe nonverbal coaching behaviors that are displayed by female volleyball and basketball coaches in confined environments. Investigators (Birdwhistell, 1970; Grant & Hennings, 1971; Harper et al., 1978) have indicated that nonverbal behaviors take on meaning only in the context in which they arise; therefore, they should be studied and interpreted in that context. Because volleyball and basketball are conducted in confined environments, the behaviors reported as displayed by coaches of those sports cannot be generalized to sports conducted in more open environments, such as field hockey or softball.

CHAPTER V

SUMMARY AND CONCLUSIONS

The purpose of this study was to explore and identify selected observable nonverbal behaviors of collegiate female varsity volleyball and basketball coaches in practice and game situations as recalled by athletes and coaches. Literature reviewed included: (a) research in nonverbal behavior and nonverbal communication, (b) selected interactional analysis systems in education, and (c) interaction analysis systems and nonverbal studies in physical education and coaching.

Within the study, answers were sought for nine questions which focused on a set of selected behaviors which might be recalled by coaches and athletes for practice and game situations. In addition, one question examined the agreement between athletes and coaches on selected behaviors for individual coaches.

Seventy-six female coaches from 44 randomly selected colleges and universities in the United States were invited to participate in the study. Of the 76 coaches, 30 coaches volunteered to participate, while only 23 coaches actually participated. Once participating coaches were identified, athletes were selected.

Of the 150 eligible athletes, 118 participated in the study.

Coaches and athletes, participating in the study, completed the Nonverbal Behavior Descriptor Questionnaire (NBDQ), which they received through the mail. The NBDQ was developed by the investigator during a preliminary study. The questionnaire lists 30 nonverbal behaviors for both practice and game situations as well as three nominal scales. The scales, used to describe behaviors, include displayed - never displayed, instructional-personal, and pleasant-unpleasant.

The data collected from the NBDQ were nominal in nature; therefore, analysis included frequency counts, McNemar's test for related samples, and the chi-square test of independence. The results of the data analyses are summarized as follows:

1. Athletes and coaches most frequently recalled, although not in the same order of frequency, six of the same behaviors as displayed by coaches in the practice situation. The behaviors included "smiles," "direct," "follows movement," "pointing," "directing," and "uses hands when talking to imitate movement."

2. Athletes and coaches most frequently recalled, although not in the same order of frequency, nine of the same behaviors as displayed by coaches in the game situation. The behaviors included "smiles," "direct,"

"follows movement," "pointing," "directing," "uses hands when talking to imitate movement," "leans forward while sitting," "pats on back," and "clapping."

3. Although similarities in practice and game situations were noted for behaviors, some differences existed in the practice and game behaviors recalled as displayed-never displayed by the coaches and athletes. According to the coaches and athletes, "standing-related posture" behaviors were recalled as behaviors displayed by coaches in the practice situation. "Sitting-related posture" behaviors as well as touching behaviors were recalled as behaviors displayed by coaches in the game situation.

4. Although similarities in coach and athlete recall were noted, some differences existed in coach and athlete descriptions of practice and game behaviors described as instructional-personal. Coaches generally described the nonverbal behaviors displayed by themselves as personal in the two situations. Athletes generally described the nonverbal behaviors as displayed by the coaches in the two situations as instructional.

5. Individual coaches and their athletes did not recall displayed-never displayed nonverbal behaviors identically. Coaches recalled between 0-16 of the 30 practice or game nonverbal behaviors identical to those recalled by their athletes.

Conclusions

Within the limits of the exploratory study of nonverbal behaviors as recalled by the subjects of the study, the following conclusions are warranted.

1. The nonverbal behaviors on the NBDQ can be recalled and described by volleyball and basketball coaches and athletes in game and practice situations.

2. There is a trend toward "standing-related posture" behaviors to be recalled as displayed by female volleyball and basketball coaches in practice situations, and "sitting-related posture" and touching behaviors to be recalled as displayed by the same coaches in game situations.

3. There is a tendency for athletes and coaches to describe behaviors that may be instructional or personal differently in practice and game situations.

4. Coaches may recall their behaviors differently than they are recalled by their players.

Implications

The significance of this study lies in its potential for application to sport. One such application might be that the NBDQ could be used as an observational instrument. Athletes, peers, teachers, administrators, student teachers or supervising teachers could use the NBDQ to note and describe coaching or teaching behaviors.

The observation results could be used both as feedback, and as a device to create awareness on the part of coaches. In addition, inservice courses or specially designed workshops for coaches which include nonverbal awareness sessions to improve nonverbal communication skills might find completion and discussion of the NBDQ of value. Finally, pending the results of further investigations, physical education teacher/coach training programs could implement nonverbal awareness units into their course of study. Such units could teach effective use of instructional nonverbal behaviors, thereby enhancing teacher/coach communication skills.

Recommendations for Further Study

This study compiled and compared observable nonverbal behaviors of collegiate female varsity volleyball and basketball coaches in practice and game situations. The exploratory study was an attempt to begin to fill the void which exists in the nonverbal behavior literature of sport. However, one study does not begin to bridge the existing gap; therefore, recommendations for future study, based on the findings of this study, follow.

1. The NBDQ could be completed by male and female athletes and coaches representing team and individual sports at all educational levels, as well as in non-educational settings. Completion of the NBDQ on such a massive scale could facilitate compiling nonverbal behaviors

displayed by coaches in sport. Thereafter, comparative analysis of the behaviors could be initiated.

2. To understand the importance of nonverbal communication in the sport setting, athletes could assign meanings to the NBDQ behaviors. Such a procedure could further define the coach-athlete interaction.

3. Using procedures for establishing a behavioral assessment system (Smith & Kendall, 1963), the NBDQ behaviors could be assigned evaluative anchors. Thereafter coaching nonverbal communication effectiveness could be rated.

4. The communication aspect of the coach-athlete relationship could be studied by employing an interaction analysis system. The behaviors, listed on the NBDQ, that were recalled as behaviors displayed by coaches, could constitute half of the system. Collection of athletes' nonverbal behaviors could be developed through similar procedures that were used to develop the NBDQ. Thereafter, juxtaposition of coach and athlete nonverbal behaviors might result in a functional and valid coach-athlete interaction analysis system. In addition, coach and athlete verbal behaviors could be added to study the total interactional process.

5. The nonverbal behaviors, listed on the NBDQ and described as instructional, could be further analyzed

and categorized as conducting, wielding, or imitating behaviors. This categorization (Grant & Hennings, 1971) could help to further understanding of nonverbal behaviors, which facilitate pedagogical functions, displayed in the sport setting.

6. Cratty (1973) and Percival (1971) both discuss and describe coaching types as well as leadership styles of coaches. The existing descriptions fail to include the nonverbal dimension. Therefore, the NBDQ could be used to supplement the existing descriptions.

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APPENDIX A

OPEN-ENDED WORD CUE LIST FOR

NONVERBAL BEHAVIORS

What are the outstanding bodily movements you notice in your coach? Can you think of any nonverbal coach behaviors (movements) that are associated with the following:

FACE

EYE CONTACT

BODY MOTION

ARM-HAND MOTION

DIRECTED ARM-HAND MOTION

BODY POSTURE

HEAD MOTION

FOOT MOVEMENTS

WALKING-GAIT

STANCE

HAND-FINGER MOVEMENTS

TOUCHING BEHAVIORS

HEIGHT-WEIGHT

NECK MOVEMENTS

NONVERBAL COACHING BEHAVIOR CHECKLIST

Listed below are adjectives that have been used to describe nonverbal behaviors (movements, physical acts or signs) of coaches. As you read the list, respond to ONLY those that you feel describe your coach. In the boxes provided after each behavior check 1. How frequently you feel that your coach uses the behavior, 2. The intensity of the movement, and 3. Whether you find it pleasant or unpleasant. I am not evaluating your coach. I am only looking at nonverbal movements, how frequently they are used and with what intensity.

BEHAVIOR	FREQUENCY				INTENSITY			FEELING	
	usually	sometimes	rarely	never	forceful	strong	weak	pleasant	unpleasant
FACE									
smiles									
frowns									
sneers									
nose wrinkles									
teeth gritting									
spitting									
EYE CONTACT									
stares									
squints									
direct									
looks away (up, down around)									
HEAD MOTION									
shaking									
follows movement									
drops head									
FOOT MOVEMENTS									
taps									
stomping									
kicking									
scuffs at ground									

NONVERBAL COACHING BEHAVIOR CHECKLIST (Cont.)

BEHAVIOR	FREQUENCY				INTENSITY			FEELING	
	usually	sometimes	rarely	never	forceful	strong	weak	pleasant	unpleasant
shuffles back & forth									
bouncing									
jumps up & down									
POSTURE/STANCE									
erect									
straight									
legs spread shoulder width									
hands on hips									
hands in pockets									
arms folded									
arms behind back									
sits up straight on bench									
leans forward while sitting									
slumps									
kneels									
slouches									
bent-over									
knees straight									
WALKING/GAIT									
slow									
pacing									
brisk									
fast									
drags feet									
walks on heels									
shuffles									

NONVERBAL COACHING BEHAVIOR CHECKLIST (cont.)

BEHAVIOR	FREQUENCY				INTENSITY			FEELING	
	usually	sometimes	rarely	never	forceful	strong	weak	pleasant	unpleasant
TOUCHING BEHAVIORS									
touches shoulder									
shakes hand									
arm around player									
taps on bottom									
grabbing arm									
hugs									
pats on back									
ARM-HAND									
pointing									
directing									
scratches head									
clapping									
clenches fists									
touches face									
bites finger nails									
plays games with fingers									
crosses fingers									
holds hands									
cracks knuckles									
taps fingers									
runs fingers through hair									
fixes glasses									
scratches neck									
snaps fingers									
shakes fists									
moves arms/hands when talking									

NONVERBAL COACHING BEHAVIOR CHECKLIST (Cont.)

BEHAVIOR	FREQUENCY				INTENSITY			FEELING	
	usually	sometimes	rarely	never	forceful	strong	weak	pleasant	unpleasant
imitates movement									
waves arms									
moves arms up & down									
hands cover mouth									
rubs forehead									
rubs hands									

THANK YOU FOR YOUR HELP

REVISED LIST OF NONVERBAL BEHAVIORS

Face

smiles
frowns

Eye Contact

stares
direct
looks away, up,down, around

Head Motion

shaking
follows movement

Posture/Stance

erect
straight
legs spread shoulder width
hands on hips
hands in pockets
sits up straight on bench
leans forward while sitting
*arms folded

Walking/Gait

slow
pacing

Touching Behaviors

touches shoulder
shakes hand
arm around player
hugs
pats on back

Arm/Hand

pointing
directing
clapping
***uses hands when talking to imitate movement
**moves arms/hands when talking
**imitates movement
***waves arms up and down
**waves arms
**moves arms up and down
*clenches fists
*scratches head
*runs fingers through hair

---

*Behaviors added from the Open-ended Word Cue List for Nonverbal Behaviors
**Collapsed behaviors from the Nonverbal Coaching Behavior Checklist
***Result of collapsed behaviors

REVISED LIST OF DESCRIPTIVE CATEGORIES

Nonverbal Coaching Behavior Checklist	Nonverbal Behavior Descriptor Questionnaire
Frequency	Behavior
usually	displayed
sometimes	never-displayed
rarely	
never	
Intensity	
forceful	
strong	
weak	
Feeling	Feeling
pleasant	pleasant
unpleasant	unpleasant
	Motion
	instructional
	personal

APPENDIX B

NONVERBAL BEHAVIOR

DESCRIPTOR QUESTIONNAIRE

The Nonverbal Behavior Descriptor questionnaire is an exploratory and descriptive questionnaire on nonverbal behaviors of coaches: **It does not attempt to evaluate coaches or determine coach effectiveness.** Its purpose is to describe the listed nonverbal behaviors you recall.

The Nonverbal Behavior Descriptor Questionnaire is to be completed by athletes and coaches of either basketball or volleyball teams. Indicate the sport to which this questionnaire is being applied. Players and coaches will complete the questionnaire on the identical sport.

Check one: VOLLEYBALL ☐
BASKETBALL ☐

Complete the following information as it pertains to you:

COACH

Number of years coaching sport .....

Size of college .....

Division of play .....

ATHLETE

Age .....

Number of years playing for this coach .....

What is the average time you play per game? ..... (minutes)

DEFINITIONS

Behavior displayed: the observable nonverbal behavior is displayed if you are aware that it is used.

Behavior never displayed: the observable nonverbal behavior is never displayed if you are unaware of its use.

Instructional motion: an observable nonverbal behavior displayed in instructional contexts (i.e., those situations in which directions for learning and performance are being given).

Personal motion: an observable nonverbal behavior displayed that is unrelated to instruction (i.e., gestures that are not related to directions given for learning or performance).

Pleasant behavior: an observable nonverbal behavior that is agreeable to you.

Unpleasant behavior: an observable nonverbal behavior that is disagreeable to you.

ATHLETES DIRECTIONS

This questionnaire is composed of thirty observable, nonverbal behaviors which your coach may display. You are to indicate next to each listed behavior whether your coach "displays behavior" or "never displays behavior".

If you check "displays behavior" continue across the row and check: (1) whether the behavior is instructional **or** personal, and (2) whether **you** find the behavior pleasant **or** unpleasant. **Check only one description** in each of the two categories.

If you check "never displays behavior" do not continue across the row, instead proceed to the next listed nonverbal behavior.

After reading the definitions on page three, turn to the practice situation section. Try to imagine that **you** are in practice and check those behaviors that **you** are aware of your coach **displaying during practice situations.** Complete the practice situation section.

Now, turn to the game section. Again, try to imagine that **you** are involved in a game situation. Follow the above directions and check those behaviors that **you** are aware of your coach **displaying during games.**

Remember the purpose of the questionnaire is to describe the nonverbal behaviors, listed on the questionnaire, which **you recall.** The questionnaire does not attempt to evaluate coaches or determine coach effectiveness.

COACHES DIRECTIONS

This questionnaire is composed of thirty observable, nonverbal behaviors which you may display. You are to indicate next to each listed behavior whether you feel you display the behavior ("displays behavior") or whether you feel you "never display the behavior".

If you check "displays behavior" continue across the row and check: (1) whether you feel the behavior is instructional **or** personal, and (2) whether **you** feel the behavior is pleasant **or** unpleasant. **Check only one description** in each of the two categories.

If you check "never displays behavior", do not continue across the row, instead proceed to the next listed nonverbal behavior.

After reading the definitions on page three, turn to the practice situation section. Try to imagine that **you** are in practice and check those behaviors that **you** are aware of displaying **during practice situations.** Complete the practice situation section.

Now, turn to the game section. Again, try to imagine that **you are** involved in a game situation. Follow the above directions and check those behaviors that **you** are aware of **displaying during games.**

Remember the purpose of the questionnaire is to describe the nonverbal behaviors, listed on the questionnaire, which **you recall.** The questionnaire does not attempt to evaluate coaches or determine coach effectiveness.

PRACTICE SITUATION SECTION

		BEHAVIOR		MOTION		FEELING	
		Displayed	Never Displayed	Instructional	Personal	Pleasant	Unpleasant
Face	1 Smiles						
	2 Frowns						
Eye Contact	3 Stares						
	4 Direct						
	5 Looks away, up, down, around						
Head Motion	6 Shaking						
	7 Follows movement						
Posture/Stance	8 Erect						
	9 Straight						
	10 Legs spread shoulder width						
	11 Hands on hips						
	12 Hands in pockets						
	13 Arms folded						
	14 Sits up straight on bench						
	15 Leans forward while sitting						
Walk	16 Slow						
	17 Pacing						
Touching Behaviors	18 Touches Shoulder						
	19 Shakes hand						
	20 Arm around player						
	21 Hugs						
	22 Pats on back						
Arm/Hand	23 Pointing						
	24 Directing						
	25 Scratches Head						
	26 Clapping						
	27 Clenches fists						
	28 Runs fingers through hair						
	29 Waves arms up and down						
	30 Uses hands when talking to imitate movement						

GAME SITUATION SECTION

			BEHAVIOR		MOTION		FEELING	
			Displayed	Never Displayed	Instructional	Personal	Pleasant	Unpleasant
Face	1	Smiles						
	2	Frowns						
Eye Contact	3	Stares						
	4	Direct						
	5	Looks away, up, down, around						
Head Motion	6	Shaking						
	7	Follows movement						
Posture/Stance	8	Erect						
	9	Straight						
	10	Legs spread shoulder width						
	11	Hands on hips						
	12	Hands in pockets						
	13	Arms folded						
	14	Sits up straight on bench						
	15	Leans forward while sitting						
Walk	16	Slow						
	17	Pacing						
Touching Behaviors	18	Touches Shoulder						
	19	Shakes hand						
	20	Arm around player						
	21	Hugs						
	22	Pats on back						
Arm/Hand	23	Pointing						
	24	Directing						
	25	Scratches Head						
	26	Clapping						
	27	Clenches fists						
	28	Runs fingers through hair						
	29	Waves arms up and down						
	30	Uses hands when talking to imitate movement						

APPENDIX C

SELECTED COLLEGES AND UNIVERSITIES

Adirondack Community College
Alabama State University
Alma College
Angelo State University
Atlantic Christian College
Aquinas College
Austin College
Bloomsburg State College
Bowling Green State Univ.
Brevard Community College
Buffalo State College
California State University, Fresno
California State University, Haywood
Central Arizona State
Central State University
Cleveland State University
Coe College
Dana College
Dennison University
Elizabethtown College
Florida State University
Francis Marion College
Garden City Community College
Glenville State College
Greenville College
Heidelberg College
High Point College
Hofstra University
Indiana University
Lenoir-Rhyne College
Norfolk State College
Palomar College
Penn State Univ. (Ogontz)
Rochester Community College
Sacramento City College
Smith College
Southwest Baptist College
State University of Ohio
Triton College
University of Arkansas
University of California, Irvine
University of North Carolina, Charlotte
University of Toledo
Winona State University

SELECTED COLLEGES AND UNIVERSITIES

Safety Schools

Herkimer County Community College

Ithaca College

Longwood College

Miami Dade Community College, North

SUNY, Oneonta

UNC, Greensboro

Participating Colleges and Universities

College Code	College/University	State	Size	Participating Team	
Safety Schools				Volleyball	Basketball
01	UNC, Greensboro	N.C.	10,000	X	
02	SUNY, Oneonta	N.Y.	6,000	X	X
03	Longwood College	Va.	2,500	X	X
04	Ithaca College	N.Y.	4,000	X	
Random Schools					
07	Alma College	Mich.	1,150		X
08	Angelo State	Texas	5,000	X	
09	Atlantic Christian College	N.C.	1,600		X
10	Austin College	Texas	1,100		X
11	Bloomsburg State College	Penn.	5,000		X
12	Brevard CC	Florida	8,500		X
13	California State University, Haywood	Calif.	12,000	X	X
14	Central State Univ.	Okla.	14,000		X

Participating Colleges and Universities (Cont.)

College Code	College/University	State	Size	Participating Team	
Random Schools	(Cont.)			Volleyball	Basketball
15	Cleveland State Univ.	Ohio	20,000	X	X
16	Coe College	Iowa	1,200		X
17	Dennison University	Ohio	2,000	X	
18	Elizabethtown College	Penn.	1,500		X
19	Francis Marion College	S.C.	2,400		X
20	Garden City CC	Kansas	1,600		X
21	Heidelberg College	Ohio	800		X
22	High Point College	N.C.	1,050		X
23	Florida State Univ.	Florida	23,000	X	X
24	Indiana University	Ind.	35,000		X
25	Lenoir-Rhyne College	N.C.	1,300		X
26	Palomar College	Calif.	15,000	X	
27	Penn State-Ogontz	Penn.	15,000		X
28	Smith College	Mass.	2,700		X

Participating Colleges and Universities (Cont.)

College Code	College/University	State	Size	Participating Team	
Random Schools (Cont.)				Volleyball	Basketball
30	University of California, Irvine	Calif.	10,000	X	
31	UNC, Charlotte	N.C.	9,000		X

APPENDIX D

LETTER TO ATHLETIC DIRECTOR

1303-C West Meadowview Road
Greensboro, North Carolina
27403
October 20, 1979

Dear

I am a graduate student, presently working on my doctoral dissertation, at the University of North Carolina at Greensboro. In order to complete the dissertation requirement, I would like to forward the attached letter to your female volleyball and/or basketball coaches requesting their participation in my study.

The letter states the purpose of the study, as well as participation requirements. If your program has required research procedures that I should follow, or does not allow research investigations to be conducted, please inform me by calling collect, weekdays after 5 PM: 919-275-0670.

Should I not hear from you by Saturday, October 27, then I will assume that the introduction letter to the volleyball and basketball coaches can be forwarded.

Thank you for your consideration in this matter. Any encouragement you might lend to coach participation in the study would be greatly appreciated.

Sincerely yours,

Jane E. Grastorf

INTRODUCTION LETTER TO COACHES

1303-C West Meadowview Road
Greensboro, North Carolina
27403
October 27, 1979

Dear

I am a graduate student, presently working on my dissertation, at the University of North Carolina at Greensboro. In order to complete the dissertation requirement, I need your help: The purpose of this letter is to request your participation in my study.

The study proposes to identify observable nonverbal behaviors of female varsity volleyball and basketball coaches in practice and game situations. Data will be collected by using a short questionnaire, which does not require your name. You are not evaluating your coaching nor are you determining your coaching effectiveness. Rather, the purpose of the questionnaire is to describe only those nonverbal behaviors that you recall by checking appropriate categories.

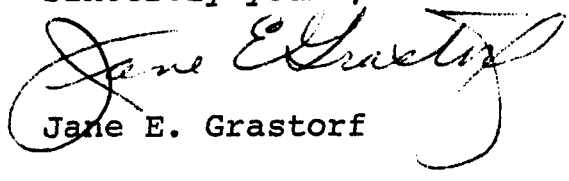
Your participation in this project would require two responsibilities: (a) answering the questionnaire, which should take no more than 15 minutes of your time, and (b) asking your team manager or selecting a player, if there is no team manager, to administer the questionnaire to consenting athletes. Administration of the questionnaire to athletes, either before or after a practice, according to the investigator's established procedures, would involve: (a) identifying five athletes to participate in the study, and (b) distributing the questionnaire envelopes to the athletes. The procedure should take no more than 15 minutes.

If you are willing to participate, in both identifying a person to administer the questionnaire to athletes, and completing your questionnaire, please fill out the enclosed consent card and return it to me as soon as possible. If you choose not to participate, please return the postcard with the appropriate box checked.

INTRODUCTION LETTER TO COACHES (cont.)

Thank you for your consideration and your immediate response. If you have any further questions, please feel free to call me collect, weekdays after 6 PM: 919-275-0670.

Sincerely yours,



Jane E. Grastorf

COACH STUDY CONSENT POSTCARD

Date: .....

..... I volunteer to cooperate in the stated study as a participant, and to identify a person to administer the questionnaire to consenting athletes according to established procedures.

..... I do not wish to participate in the study.

Name: .....

School: .....

Address: .....

.....

.....

Phone: .....

RETURN LETTER TO COACHES

1303-C West Meadowview Road
Greensboro, North Carolina
27403
November 2, 1979

Dear

Thank you for your positive response to participate in my study which proposes to identify observable nonverbal behaviors of female varsity volleyball and basketball coaches in practice and game situations.

Enclosed you will find the following investigation materials: (a) informed consent postcards for you and your five athletes, (b) questionnaire booklets with stamped, addressed, return envelopes for you and your five athletes, (c) an informed consent postcard for your team manager, (d) athlete introduction letters, and (e) a copy of the administration procedures.

Your participation in this study, as indicated in my October 30, 1979, letter, requests that you do the following:

1. Ask your team manager or a selected player, if you have no team manager, to select five players and distribute the questionnaires to the selected players according to the outlined administration procedures enclosed.

2. Discuss with your team manager or selected player what day to distribute the questionnaires and decide whether to distribute the questionnaires before or after a practice session. Please do not distribute or complete the questionnaires before or after a game.

3. Request that the team manager complete the team manager informed consent postcard and mail it to me.

4. Sign your informed consent postcard and complete your questionnaire the same evening your athletes are asked to complete their investigation materials.

RETURN LETTER TO COACHES (cont.)

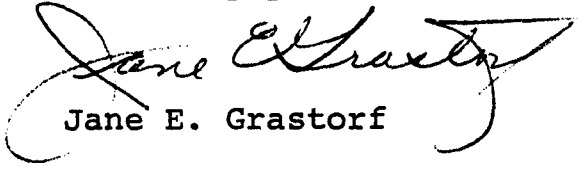
5. Indicate on your informed consent postcard if you desire a summary of the study results.

6. Mail separately both your informed consent postcard and questionnaire to me.

Please try to complete and mail all investigation materials to me immediately following the administration of the questionnaire but not later than December 7, 1979.

At this time I want to thank you for your cooperation in my study. Without you this investigation would not have been possible.

Sincerely yours,



Jane E. Grastorf

ATHLETE PARTICIPATION REQUEST LETTER

1303-C West Meadowview Road
Greensboro, North Carolina
27403
November, 1979

Dear Athlete:

I am a graduate student, presently working on my doctoral dissertation, at the University of North Carolina at Greensboro. In order to complete the dissertation requirement, I need your help. Hence, the purpose of this letter is to request your participation in my study.

The study proposes to identify observable nonverbal behaviors of female varsity coaches in practice and game situations. Data will be collected by using a short questionnaire, which does not require your name. You are not evaluating your coach nor are you determining coaching effectiveness. Rather, the purpose of the questionnaire is to describe only those nonverbal behaviors that you recall by checking appropriate categories.

Your participation in this project would require the following: (a) signing the informed consent, (b) mailing the signed informed consent postcard to the investigator, (c) completing the questionnaire at home the evening you receive it, (d) enclosing the questionnaire in the self addressed and stamped envelope attached to the questionnaire, and (e) mailing the sealed envelope to the investigator the following day. The entire procedure should take no more than 15 minutes of your time.

If you are willing to participate, please indicate this to the team manager or selected player distributing the investigation materials for me. Your answers will remain anonymous, and I will be the only individual reviewing your responses.

ATHLETE PARTICIPATION REQUEST LETTER (cont.)

Thank you for your consideration and participation in my study.

Sincerely yours,

Jane E. Grastorf

INFORMED CONSENT FORMS

Gastorf's Study on Nonverbal Behaviors

INFORMED CONSENT FORM

I understand that the purpose of the study is to identify observable nonverbal behaviors of female vasirty coaches in practice and game situations. I have been fully informed as to why I qualify for participation. I understand that my responses on the questionnaire will remain anonymous. In addition: (a) I confirm that my participation is entirely voluntary, no coercion was applied to obtain my cooperation, (b) I understand that I may terminate my participation at anytime during the study, (c) I understand that my responses will be used in research by the investigator in the completion of her dissertation and publication(s) subsequently based on it, and (d) I understand that I may obtain a summary of the study results by writing the investigator.

After having read the above, I volunteer to cooperate in the stated study as a participant.

Signature .....

Address .....

.....

Date .....

Gastorf's Study on Nonverbal Behaviors

TEAM MANAGER INFORMED CONSENT FORM

I volunteer to cooperate in the administration of the questionnaire to consenting athletes according to established administration procedures.

Signature .....

Address .....

.....

Phone No. .....

Team .....

School .....

ADMINISTRATION PROCEDURES

Grastorf's Study on Nonverbal Behaviors

Attached you should have the following investigation materials:

1. Team manager informed consent postcard
2. 5 athlete participation request letters
3. 5 questionnaires with stamped, addressed, return envelopes attached

The investigation materials are being used in a doctoral dissertation study. In order for the study to be reliable and valid, please follow the directions printed.

A. COMPLETE the team manager consent postcard and mail it to me.

B. DISCUSS with your coach what day the questionnaires will be distributed and decide whether to distribute the questionnaires before or after a practice session. All investigation materials should be completed and mailed to me on or before December 7, 1979.

C. SELECT 5 participating athletes according to the following procedures:

   1. Alphabetize, then number, your team roster.

   2. Match the following 5 random numbers to your numbered team roster.

      _____

      _____

      _____

      _____

      _____

The five athletes whose numbers match the five random numbers should be asked to participate in the study. Should any of those athletes not desire to participate in the study, use the following random numbers, in order of their listing, to select remaining athletes.

____

____

____

____

____

Again, ask the athlete whose number matches the listed random number.

D. ADMINISTER athlete investigation materials according to the following procedures:

1. Ask the selected athletes, who were selected under item C, to read the participation letter.

2. Distribute the informed consent postcards and questionnaires, with stamped, addressed, return envelopes attached, to those athletes who indicate they will participate in the study.

3. Request the athletes to complete their informed consent postcard and questionnaire at home that evening, and to mail both items separately to the investigator on the following day.

4. Inform the athletes that their coach will also complete the identical questionnaire the same evening.

5. Read the following to the athletes:

The questionnaire you are asked to complete is being taken by female basketball and volleyball players and coaches in many different colleges and universities throughout the United States. Please follow the directions as stated on the questionnaire. Answer all items honestly. The investigator will be the only one to review your answers.

Federal and University regulations require investigators to obtain a signed informed consent from each individual participating in the study. This regulation protects you because it requires the investigator to completely inform you of your participation in the study. Please sign your consent form and immediately mail it to me. If you desire a summary of the study results, please indicate this on your informed consent postcard.

At this time I want to thank you for your cooperation in my study. Without you, your coach and team manager, this investigation would not have been possible.

6. AGAIN: Remind athletes to complete their investigation materials that evening and to mail both items the following day. THANK YOU for following the above directions as printed.

NOTE: The number recorded on the back cover of the questionnaire is to help the investigator identify school returns. It in no way identifies coaches or athletes.

FIRST AND SECOND DISTRIBUTION INSTRUCTIONS

In order to establish the reliability of the Nonverbal Behavior Descriptor Questionnaire, the questionnaire must be completed twice by the same individual. Distribution of the first and second questionnaires must be before or after a practice session, not a game situation. There should be a minimum of three days, and a maximum of eight days between the distribution and completion of the first and second questionnaires.

FIRST DISTRIBUTION: Please follow the administration procedures, as listed and enclosed, for the first distribution of the questionnaires. Additional instructions to be included after Section D, item 5 are:

1. Ask the athletes to decide on a code name, number or drawing, they wish to be identified by. Have them place their code in the white rectangle found in the upper right hand corner of their questionnaire.

2. Ask the athletes to remember the code they used, or to record it at home that evening so they will remember it.

3. Inform the athletes that within a week they will be asked to complete another form for the investigator. At that time, they will be asked to record the same code they recorded on their first questionnaire on the second form. Explain that the code maintains their anonymity, yet helps the investigator to match their two questionnaires. This is needed to establish the reliability of the Nonverbal Behavior Descriptor Questionnaire. Please do not inform the athletes that they will be completing the identical questionnaire on the second distribution.

Distribute the booklets labelled first distribution first! Those booklets can also be identified as having lower numbers. Coaches will use the booklet labelled 1st in the upper right hand corner of the questionnaire.

SECOND DISTRIBUTION: Please follow the administration procedures listed under Section D, items 3 and 4. Omit the consent form. Ask the athletes to fill in their

identification code in the white rectangle found in the upper right hand corner of their questionnaire. Read Section D, item 5, paragraphs 1 and 3.

Distribute the booklets labelled second distribution. Those booklets can be identified as having higher numbers. Coaches will use the booklet labelled 2nd in the upper right hand corner of the questionnaire.

THANK YOU FOR YOUR COOPERATION IN HELPING ME TO ESTABLISH THE RELIABILITY OF THE NBDQ.

APPENDIX E

TABLE A

Frequencies and Percentages for Displayed Practice and Game Behaviors That Are Instructional - Personal as Recalled by Athletes

Item #	Behavior	Practice					Game				
		Instructional		Personal			Instructional		Personal		
		N[a]	F	%	F	%	N[a]	F	%	F	%
1	Smiles	4	45	42.06	62	57.94	1	43	42.16	59	57.84
2	Frowns	1	65	69.89	28	30.11		56	61.54	35	38.46
3	Stares	1	36	62.07	22	37.93	1	31	60.78	20	39.22
4	Direct	5	84	86.60	13	13.40	4	85	81.73	19	18.27
5	Looks away, up, down, around	2	25	51.02	24	48.98	1	18	43.90	23	56.10
6	Shaking	1	43	66.15	22	33.85	1	41	63.08	24	36.92
7	Follows movement		93	93.00	7	17.00	3	85	88.54	11	11.46
8	Erect	2	41	53.25	36	46.75	3	37	54.41	31	45.59
9	Straight	2	43	51.19	41	48.81	2	35	47.30	39	52.70
10	Legs spread shoulder width	1	40	56.34	31	43.66	1	36	60.00	24	40.00
11	Hands on hips	2	30	46.15	35	53.85	3	27	47.37	30	52.63
12	Hands in pockets	3	19	36.54	33	63.46	3	16	39.02	25	60.98
13	Arms folded	3	35	47.95	38	52.05	3	32	50.79	31	49.21
14	Sits up straight on bench	1	19	52.78	17	47.22	3	31	51.67	29	48.33
15	Leans forward while sitting	1	48	76.19	15	23.81		66	67.35	32	32.65
16	Slow	3	33	52.38	30	47.62	4	23	50.00	23	50.00
17	Pacing	1	38	71.70	15	28.30	2	31	57.41	23	42.59
18	Touches Shoulder		52	66.67	26	33.33	1	52	62.65	31	37.35
19	Shakes hand	2	16	50.00	16	50.00	2	23	38.33	37	61.67
20	Arm around player		33	56.90	25	43.10		36	52.17	33	47.83
21	Hugs		5	29.41	12	70.59		10	30.30	23	69.70
22	Pats on back	1	48	57.83	35	42.17	1	49	48.04	53	51.96
23	Pointing		102	97.14	3	2.86		97	97.98	2	2.02
24	Directing	1	102	95.33	5	4.67	1	100	99.01	1	.99
25	Scratches Head	1	19	51.35	18	48.65	1	17	48.57	18	51.43
26	Clapping	4	47	61.84	29	38.16	4	60	60.00	40	40.00
27	Clenches fists	1	20	57.14	15	42.86		20	44.44	25	55.56
28	Runs fingers through hair	1	14	42.42	19	57.58	1	12	34.29	23	65.71
29	Waves arms up and down	2	40	75.47	13	24.53	2	36	70.59	15	29.41
30	Uses hands when talking to imitate movement	4	97	95.10	5	4.90	2	101	96.19	4	3.81

[a]The number of athletes who checked the behavior as being displayed, but failed to check whether it was instructional or personal.

TABLE B

Frequencies and Percentages for Displayed Practice and Game Behaviors That Are Pleasant-Unpleasant as Recalled by Athletes

Item #	Behavior	Practice					Game				
		Pleasant			Unpleasant		Pleasant			Unpleasant	
		N[a]	F	%	F	%	N[a]	F	%	F	%
1	Smiles	4	106	99.07	1	.93	1	100	96.15	4	3.85
2	Frowns	4	16	17.78	74	82.22	3	16	18.18	72	81.82
3	Stares	2	19	33.33	38	66.67	1	17	33.33	34	66.67
4	Direct	5	76	78.35	21	21.65	8	82	82.00	18	18.00
5	Looks away, up, down, around	2	16	32.65	33	67.35	3	9	23.08	30	76.92
6	Shaking	3	25	40.98	36	59.02	2	26	40.63	38	59.38
7	Follows movement	3	96	98.97	1	1.03	5	90	95.74	4	4.26
8	Erect	1	71	91.03	7	8.97	4	59	88.06	8	11.94
9	Straight	2	80	95.24	4	4.76	5	64	90.14	7	9.86
10	Legs spread shoulder width	7	56	86.15	9	13.85	5	47	83.93	9	16.07
11	Hands on hips	2	34	52.31	31	47.69	2	23	39.66	35	60.34
12	Hands in pockets		36	65.45	19	34.55	1	26	60.47	17	39.53
13	Arms folded	1	47	62.67	28	37.33	4	35	56.45	27	43.55
14	Sits up straight on bench	1	27	75.00	9	25.00	1	54	87.10	8	12.90
15	Leans forward while sitting	3	54	88.52	7	11.48	5	82	88.17	11	11.83
16	Slow	2	53	82.81	11	17.19	3	36	76.60	11	23.40
17	Pacing	2	29	55.77	23	44.23	4	26	50.00	26	50.00
18	Touches Shoulder	2	71	93.42	5	6.58	5	73	92.41	6	7.59
19	Shakes hand	2	31	96.88	1	3.13	2	59	98.33	1	1.67
20	Arm around player	3	51	92.73	4	7.27	5	56	87.50	8	12.50
21	Hugs	1	14	87.50	2	12.50	3	27	90.00	3	10.00
22	Pats on back	1	80	97.56	2	2.44	5	96	97.96	2	2.04
23	Pointing	4	85	84.16	16	15.84	7	75	81.52	17	18.48
24	Directing	6	94	92.16	8	7.84	10	88	95.65	4	4.35
25	Scratches Head	2	20	55.56	16	44.44		21	58.33	15	41.67
26	Clapping	1	78	98.73	1	1.27	4	98	98.00	2	2.00
27	Clenches fists	3	7	21.21	26	78.79	2	5	11.63	38	88.37
28	Runs fingers through hair	3	18	58.06	13	41.94	1	16	45.71	19	54.29
29	Waves arms up and down	2	30	56.60	23	43.40	5	22	45.83	26	54.17
30	Uses hands when talking to imitate movement	5	95	94.06	6	5.94	7	92	92.00	8	8.00

[a]The number of athletes who checked the behavior as being displayed, but failed to check whether it was pleasant-unpleasant

TABLE C

Coaches' Frequencies and Percentages for Practice and Game Behaviors That Are Instructional-Personal as Recalled by Coaches

Item #	Behavior	Practice					Game				
		Instructional			Personal		Instructional			Personal	
		N[a]	F	%	F	%	N[a]	F	%	F	%
1	Smiles		9	39.13	14	60.87		5	23.81	16	76.19
2	Frowns		10	45.45	12	54.55		8	38.10	13	61.90
3	Stares		6	60.00	4	40.00		4	40.00	6	60.00
4	Direct		19	90.48	2	9.52		19	90.48	2	9.52
5	Looks away, up, down, around		5	50.00	5	50.00		2	10.67	10	83.33
6	Shaking		13	76.47	4	23.53		12	70.59	5	29.41
7	Follows movement		19	82.61	4	17.39	1	15	71.43	6	28.57
8	Erect		7	50.00	7	50.00		4	33.33	8	66.67
9	Straight		7	36.84	12	63.16		2	15.38	11	84.62
10	Legs spread shoulder width		9	56.25	7	43.75		0	0.00	8	100.00
11	Hands on hips		4	30.77	9	69.23		2	20.00	8	80.00
12	Hands in pockets		1	7.69	12	92.31		0	0.00	7	100.00
13	Arms folded		4	20.00	16	80.00		1	7.14	13	92.86
14	Sits up straight on bench		2	33.33	4	66.67		2	22.22	7	77.78
15	Leans forward while sitting		3	33.33	6	66.67		7	31.82	15	68.18
16	Slow		6	37.50	10	62.50	1	2	15.38	11	84.62
17	Pacing		5	35.71	9	64.29	1	1	11.11	8	88.89
18	Touches Shoulder		8	47.06	9	52.94		10	62.50	6	37.50
19	Shakes hand		2	40.00	3	60.00		1	6.67	14	93.33
20	Arm around player		6	50.00	6	50.00	1	7	43.75	9	56.25
21	Hugs		2	66.67	1	33.33		1	10.00	9	90.00
22	Pats on back		8	42.11	11	57.89		5	22.73	17	77.27
23	Pointing		19	100.00	0	0.00		21	100.00	0	0.00
24	Directing		22	100.00	0	0.00		21	100.00	0	0.00
25	Scratches Head		0	0.00	6	100.00		0	0.00	8	100.00
26	Clapping		11	61.11	7	38.89		10	50.00	10	50.00
27	Clenches fists		2	33.33	4	66.67		3	30.00	7	70.00
28	Runs fingers through hair	1	1	12.50	7	87.50		0	0.00	7	100.00
29	Waves arms up and down		5	50.00	5	50.00		6	66.67	3	33.33
30	Uses hands when talking to imitate movement	2	19	95.00	1	5.00		21	100.00	0	0.00

[a]The number of coaches who checked the behavior as being displayed, but failed to check whether it was instructional or personal.

TABLE D

Frequencies and Percentages for Displayed Practice and Game Behaviors That Are Pleasant-Unpleasant as Recalled by Coaches

Item #	Behavior	Practice					Game				
		Pleasant			Unpleasant		Pleasant			Unpleasant	
		N[a]	F	%	F	%	N[a]	F	%	F	%
1	Smiles		23	100.00	0	0.00		21	100.00	0	0.00
2	Frowns	1	2	9.52	19	90.48	1	1	5.00	19	95.00
3	Stares		4	40.00	6	60.00		1	10.00	9	90.00
4	Direct		18	85.71	3	14.29	1	18	90.00	2	10.00
5	Looks away, up, down, around		6	60.00	4	40.00		2	16.67	10	83.33
6	Shaking		9	52.94	8	47.06		9	52.94	8	47.06
7	Follows movement	1	22	100.00	0	0.00		22	100.00	0	0.00
8	Erect		14	100.00	0	0.00	1	11	100.00	0	0.00
9	Straight	1	17	94.44	1	5.56		13	100.00	0	0.00
10	Legs spread shoulder width		15	93.75	1	6.25		7	87.50	1	12.50
11	Hands on hips		9	69.23	4	30.77		6	60.00	4	40.00
12	Hands in pockets		13	100.00	0	0.00		5	71.43	2	28.57
13	Arms folded		17	85.00	3	15.00		11	78.57	3	21.43
14	Sits up straight on bench		6	100.00	0	0.00		9	100.00	0	0.00
15	Leans forward while sitting		8	88.89	1	11.11		20	90.91	2	9.09
16	Slow		16	100.00	0	0.00		13	92.86	1	7.14
17	Pacing		10	71.43	4	28.57		6	60.00	4	40.00
18	Touches Shoulder		16	94.12	1	5.88		16	100.00	0	0.00
19	Shakes hand		5	100.00	0	0.00		15	100.00	0	0.00
20	Arm around player		12	100.00	0	0.00		17	100.00	0	0.00
21	Hugs		3	100.00	0	0.00		10	100.00	0	0.00
22	Pats on back		19	100.00	0	0.00		21	95.45	1	4.55
23	Pointing		17	89.47	2	10.53	1	15	75.00	5	25.00
24	Directing	1	21	100.00	0	0.00	1	20	100.00	0	0.00
25	Scratches Head		3	50.00	3	50.00		4	50.00	4	50.00
26	Clapping		18	100.00	0	0.00		20	100.00	0	0.00
27	Clenches fists		4	66.67	2	33.33		5	50.00	5	50.00
28	Runs fingers through hair	1	4	50.00	4	50.00		2	28.57	5	71.43
29	Waves arms up and down	1	7	70.00	3	30.00		5	55.56	4	44.44
30	Uses hands when talking to imitate movement		20	90.41	2	9.09		19	90.48	2	9.52

[a]The number of coaches who checked the behavior as being displayed, but failed to check whether it was pleasant-unpleasant.