A System for the Behavioral Assessment of Athletic Coaches

RONALD E. SMITH, FRANK L. SMOLL, AND EARL HUNT

A behavioral assessment system for coding and analyzing the behaviors of athletic coaches in naturalistic settings is described. The Coaching Behavior Assessment System (CBAS) consists of 12 behavioral categories derived from content analyses of coaching behaviors during practices and games. The manner in which coders are trained and the CBAS used in field settings is described, and the results of several reliability studies are reported. These studies indicate that high scorer accuracy and interrater reliability can be attained. The potential use of the CBAS to extend the siudy of interpersonal behavior into the realm of sport psychology is also discussed.

In recent years, the behavioral assessment approach has achieved a widening range of application. Since it involves the systematic observation and coding of behavior in naturalistic settings, behavioral assessment complements psychometric trait approaches based on self-reports of behavior (4). The present report describes the development and application of a behavioral assessment system within the emerging subdiscipline of sport psychology.

Recent years have witnessed an increasing concern regarding the effects of organized athletics upon the psychosocial development of children. Existing data indicate that sport participation has neither a universally positive nor a uniformly negative effect (6). Rather, it is likely that the effects vary as a function of the way in which programs are structured, the kind of supervision that exists, and the personal characteristics of the child. Unfortunately, the manner in which these factors interact has not been empirically determined. Doing so will require methodological advances in the measurement of relevant factors. The Coaching Be-

havior Assessment System (CBAS) was developed to permit the measurement of one factor presumably important in sports—coaching behavior. Both the measurement approach and the behavioral categories of the CBAS are an outgrowth of social learning theory (2, 5). The categories, though empirically derived, tap behavioral dimensions that have been shown to affect both children and adults in a variety of nonathletic settings (1, 3).

Development of the CBAS

The CBAS was developed over a period of several years. Initially, soccer coaches were observed during practice sessions and games to determine the classes of behavior that occurred. The observers carried portable tape recorders and essentially did a "play-by-play" of the coaches' behaviors using a time sampling procedure. The behavior descriptions were transcribed and content analyzed in light of concepts from social learning theory to develop an initial set of scoring categories from which the present system eventually evolved. Subsequent use of the system in observing and coding the behaviors of basketball, baseball, and football coaches indicated that the scoring system was sufficiently comprehensive to incorporate the vast majority of coaching behaviors, that individual differences in behavioral patterns can be discerned, and that the coding system can be used easily in field settings.

Behavioral Categories

In the CBAS, we deal with two major classes of behaviors. Reactive behaviors are responses to immediately preceding player or team behaviors, while spontaneous behaviors are initiated by the coach and are not responses to immediately preceding events. These classes are roughly analogous to the distinction between elicited behaviors (responses to identifiable stimuli) and emitted behaviors (behaviors that do not have clear-cut antecedents). As shown in Figure 1, reactive behaviors are responses to either desirable performances, mistakes, or misbehaviors on the part of players, while the spontaneous class is subdivided into game-related and game-irrelevant behaviors initiated by the coach. The system thus involves basic interactions between the situation and the coach's behavior.

The CBAS contains 12 behavioral categories:

Reactive Behaviors

Responses to desirable performances

1. Positive reinforcement or reward (R). A positive reaction by the coach to a desirable performance by one or more players. R may be verbal or nonverbal in nature. Examples include congratulating a player or patting a player on the back after a good play.

2. Nonreinforcement (NR). A failure to reinforce a positive behavior; the coach essentially fails to respond. An example would be a player getting a base hit and the coach showing no reaction.

Reactions to mistakes

3. Mistake-contingent encouragement (EM). Encouragement of a player by a coach following a player's mistake.

4. Mistake-contingent technical instruction (TIM). Telling or showing a player who has made a mistake how to make the play correctly. TIM behavior requires that the coach instruct the player in some specific way. An example is showing a player how to field a ball after an error has been made.

5. Punishment (P). A negative response by the coach following an undesirable behavior. Like R, P may be either verbal or nonverbal. Examples include making

CLASS I.   REACTIVE BEHAVIORS

A. DESIRABLE PERFORMANCE
    1. POSITIVE REINFORCEMENT   (R)
    2. NONREINFORCEMENT   (NR)

PLAYER BEHAVIORS

B. MISTAKES/ERRORS
    3. MISTAKE-CONTINGENT ENCOURAGEMENT   (EM)
    4. MISTAKE-CONTINGENT TECHNICAL
        INSTRUCTION   (TIM)
    5. PUNISHMENT   (P)
    6. PUNITIVE TIM   (TIM+P)
    7. IGNORING MISTAKES   (IM)

C. MISBEHAVIORS
    8. KEEPING CONTROL   (KC)

CLASS II.   SPONTANEOUS BEHAVIORS

A. GAME-RELATED
    9. GENERAL TECHNICAL INSTRUCTION   (TIG)
    10. GENERAL ENCOURAGEMENT   (EG)
    11. ORGANIZATION   (O)

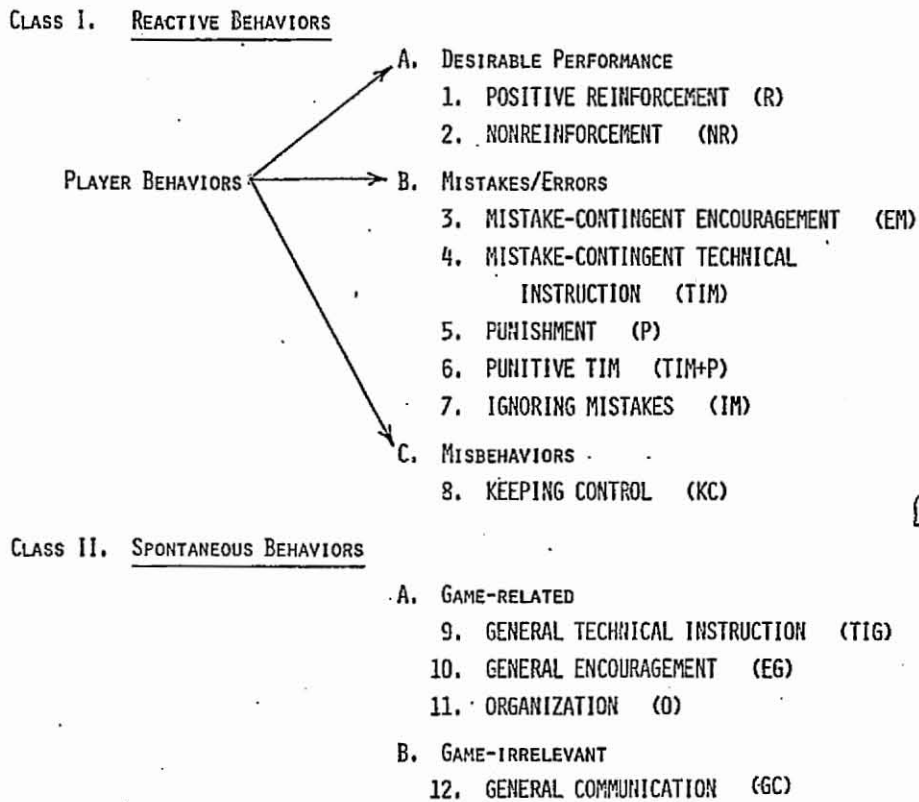B. GAME-IRRELEVANT
    12. GENERAL COMMUNICATION   (GC)

Figure 1—CBAS response categories.

a sarcastic remark to a player who has just struck out or the coach waving in disgust after a player has made an error.

6. Punitive TIM (TIM + P). Sometimes TIM and P occur in the same communication, as when a coach says, "How many times do I have to tell you to catch the ball with two hands!" Whenever a coach gives TIM in a punitive or hostile manner, P is also scored (TIM + P).

7. Ignoring mistakes (IM). A lack of response, either positive or negative, to a mistake on the part of a player or the team. Essentially, IM occurs when a coach does not respond with EM, TIM, P, or TIM + P to a mistake.

Response to misbehaviors

8. Keeping control (KC). Responses that are designed to maintain order. Such behaviors by a coach are ordinarily elicited by unruly conduct or inattentiveness by the players.

Spontaneous Behaviors

Game-related spontaneous behaviors

9. General technical instruction (TIG). A communication that provides instruction relevant to techniques and strategies of the sport in question. As in the case of TIM, the purpose of these communications is to foster the learning of skills and strategies for dealing with game situations. The message must clearly be one of instruction. Unlike TIM, TIG is not elicited by an immediately preceding mistake

by a player or the team. Rather, it is coach-initiated. Baseball examples include telling or showing a player how to bat or field, telling a fielder which base to throw to, telling a pitcher to take more time between pitches, and shifting the infield or out-field in a strategic manner.

10. General encouragement (EG). Encouragement that does not immediately follow a mistake. EG differs from the R and EM categories in that it is not a response to specific actions by the players. It relates to future hopes, rather than the behaviors of the past. It differs from technical instruction in that the coach makes requests with which the players may not necessarily be able to comply (e.g., "Come on, team, let's get some runs.").

11. Organization (O). Behavior directed at administrative organization, such as reminding the players of the batting order, announcing substitutions, reassigning positions, and telling players to coach on the bases. It involves organizational behavior that is not intended to influence play immediately. Thus, putting in a new shortstop is scored O, while positioning the shortstop closer to second base is scored technical instruction.

Game-irrelevant spontaneous behavior

12. General communication (GC). Interactions with players that are unrelated to game situations or team activities, such as joking with players, conversation about family members, daily activities, etc.

In utilizing the CBAS, observers station themselves at a point from which they can observe the coach in an unobtrusive manner. Observers do not introduce themselves to the coach, nor do they indicate in any way that they will be observing him or her. Naturally, consent for observation will have been obtained prior to observation, but this is generally done before the start of the season. Observations are recorded by writing the behavioral codes (e.g., R, P, TIM) as the behaviors occur.

Training Procedures

In utilizing any behavioral assessment system, it is essential that observers be well trained and competent. Unless independent observers can agree on how a particular behavior is to be categorized, the system cannot be scientifically useful. Thus, a major goal of any training program should be to establish high interrater reliability. A training program developed by the authors to achieve this goal includes: (a) extended study of a training manual (7) containing an explanation of the CBAS and instructions for its use; (b) group instruction in use of the scoring system, including viewing and discussion of an audiovisual training module (8); (c) written tests in which trainees are required to define the CBAS categories and score behavioral examples; (d) the scoring of videotaped sequences of coaching behaviors; and (e) extensive practice in the use of the CBAS in actual field settings.[1] A high degree of demonstrated expertise in the use of the CBAS should be required before an observer is permitted to use the system for research purposes.

Reliability Studies

Several studies have been performed to assess the reliability of the CBAS coding system as well as to evaluate the effectiveness of the observer training program. In the first study, 31 trainees viewed a videotaped sequence of 48 randomly ordered discrete coaching behaviors performed by an actor. In each instance, the game situation was verbally described by a narrator and the coach's behavior was then

---

[1] Information regarding the *CBAS Audio Visual Training Module*, which includes videotaped instruction in the categories, examples of the various coaching behaviors, and a videotaped proficiency test on the CBAS, is available from the authors together with test forms.

Table 1—Distribution of Reliability Coefficients Obtained by 171 Observer Pairs
and between 19 Observers and 2 Experts

Reliability Coefficients	Frequency (observer pairs)	Frequency (observers-experts)
+.90 to +.99	69	12
+.80 to +.89	57	3
+.70 to +.79	33	1
+.60 to +.69	10	3
+.50 to +.59	2	—

shown. Each of the 12 CBAS categories was represented four times. Scoring accuracy was defined in terms of agreement with scoring of the behaviors by the authors. The number of scoring errors ranged from 0 to 5 with a mean of 1.06 errors per observer. This yielded an average agreement with expert scoring of 97.8%.

The consistency of scoring over time was assessed by readministering the video-tape of the 48 coaching behaviors to 24 of the trainees one week after the first viewing. The trainees had been given no feedback about their initial codings. The index of consistency was the percentage of behaviors that were scored identically on the two administrations. These percentages ranged from 87.5% to 100%, with a mean consistency score of 96.4%.

Two studies were performed to assess interrater reliability of CBAS scoring in field settings. In the first, five observers independently and simultaneously coded the behaviors of a female Little League Baseball coach during a six-inning game that lasted 84 min. An average of 250 behaviors were coded. The correlation coefficients between the coding frequencies of observer pairs across the 12 CBAS categories ranged from +.77 to +.99.[2] The average interrater reliability coefficient was +.88.

A second interrater reliability study was undertaken in which two of the authors and 19 trained observers used the CBAS to code independently the behaviors of a male Little League Baseball coach during a five-inning game that lasted 91 min. An average of 208 behaviors were coded during this time interval. The authors scored each behavior in consultation to provide a basis for assessing the accuracy of the observers. Reliability coefficients were computed between all possible pairs of observers, which resulted in a total of 171 coefficients reflecting the degree of correspondence of coding frequencies across the behavioral categories. A frequency distribution of the number of observer pairs that attained various levels of interrater reliability is presented in Table 1. The mean interrater reliability coefficient for the 171 observer pairs was +.88.

Reliability coefficients computed between the 19 observers and the criterion codings of the authors indicated a high level of accuracy in the observers' coding of the data. The coefficients ranged from +.62 to +.98, with a mean reliability coefficient of +.86. The distribution of reliability coefficients between authors and observers is also presented in Table 1.

Discussion

The results of the reliability studies indicate that observers can be trained to use the CBAS system with a high degree of reliability and accuracy in coding the be-

---

[2] Experience in using the CBAS suggests that the most useful and reliable behavioral index is the relative frequency of behaviors within each coding category. The reliability data are based on this index.

haviors of baseball coaches. The reliability of CBAS scorers is undoubtedly enhanced by the fact that the categories are functionally related to the presence (or absence in the case of spontaneous categories) of specific situational occurrences. The nature of the situation thus eliminates all but a subset of categories. If a desirable game development occurs, for example, the coach can respond only with reward or nonreinforcement. In the case of a mistake or error, there are only five possible codes, and the reliability data indicate that the five categories are quite discriminable.

Just as sports differ in their degree of complexity, they also vary in the ease with which coaching behaviors can be coded. Sports like baseball and volleyball are ideal for a coding system like the CBAS because game developments are relatively discrete events, and it is usually quite easy to determine what the coach is responding to. On the other hand, in sports like basketball and soccer, the game action is continuous, and it is sometimes difficult to ascertain what the coach is responding to. Even in such instances, however, the nature of the game occurrence can usually be inferred from the coach's behavior, and Tharp and Gallimore (10) have shown that a behavioral coding system similar in some respects to the CBAS can be applied to basketball with high interobserver reliability.

While behavioral assessment procedures can provide extremely valuable data within naturalistic settings, there are some potential problems with using a system like the CBAS, and researchers should be aware of them. One problem is reactivity —behavior change occurring as a result of being observed. By mere presence, an observer may influence the coach's behavior. While it is difficult to eliminate completely these reactivity effects unless the observations are made without the coach's awareness, observers can reduce such effects by being as unobtrusive as possible. In addition, reactivity can be reduced by a period of acclimation during which the observer is present and apparently coding the coach's behavior. Most coaches will eventually become accustomed to the presence of the observer, and reactivity effects are reduced.

A second potential source of error is the observer's expectations about what will be observed. Biases and expectations can cause observers to attend selectively to certain elements and to disregard erroneously other behaviors that are not consistent with their expectations. For example, if observers expect a coach to be extremely punitive, they may fail to note instances of encouragement or reinforcement. It is important to be aware of this potential source of bias and to make every attempt to code the behaviors as objectively as possible. Some observers have found it useful to disregard completely the identity of the coach they are observing and to focus their attention completely on the situation and the coach's behaviors. Each behavior should be independently categorized, and the coding that occurs should not be influenced by the coach's previous behavior.

Occasionally observers who are initially trained to a high level of reliability begin to "drift" away from the system as they start to attach their own meaning to the categories. This is typically noted in situations in which teams of observers work together for a period of time and, through their discussions, develop new interpretations of the scoring categories. It is therefore of utmost importance that reliability checks be repeated at regular intervals during data collection.

The CBAS appears to have considerable promise as a research tool. It is possible to relate CBAS measures of actual coaching behaviors to players' reactions to their athletic experience, as is being done in a current research project (9). A determination of such relationships can provide an empirical foundation for training coaches to relate more effectively to their players. By obtaining pre- and postmeasures, the CBAS can also be used to assess the effects of clinics and other programs designed to influence coaching techniques. Since the CBAS categories tap behaviors that have been shown to influence individuals in nonathletic settings, the

coding system can facilitate an extension of theoretically meaningful research from other areas of interpersonal behavior into the realm of sport psychology. Finally, while the CBAS was developed for use in athletic settings, the system could also be utilized to analyze behavior in other leadership settings, such as the classroom.

References

(1) Bales, R. F., and Slater, P. Role differentiation in small decision-making groups. *In* Family, Socialization, and Interaction Process. P. Parson and R. F. Bales (eds.). Glencoe, Ill.: Free Press, 1955.

(2) Bandura, A., and Walters, R. Social Learning and Personality Development. Holt, Rhinehart, and Winston, 1963.

(3) Berkowitz, L. A Survey of Social Psychology. Hinsdale, Ill.: Dryden Press, 1975.

(4) Goldfried, M. R., and Sprafkin, J. N. Behavioral Personality Assessment. Morristown, N. J.: General Learning Press, 1974.

(5) Mischel, W. Toward a cognitive social learning reconceptualization of personality. Psychological Review 80:252–83, 1973.

(6) Rarick, G. L. Competitive sports for young boys: Controversial issues. Medicine and Science in Sports 1:181–84, 1969.

(7) Smith, R. E.; Smoll, F. L.; and Hunt, E. B. Training manual for the coaching behavior assessment system. JSAS Catalog of Selected Documents in Psychology 7:2, 1977.

(8) Smith, R. E.; Smoll, F. L.; Hunt, E. B.; and Clark, S. J. CBAS Audio Visual Training Module. Seattle: University of Washington, 1976. (Film)

(9) Smoll, F. L.; Smith, R. E.; and Hunt, E. B. Methodological procedures in the behavioral assessment of amateur coaches in youth programs. Paper presented at the North American Society for the Psychology of Sport and Physical Activity Conference, Anaheim, Cal., March 1974.

(10) Tharp, R. G., and Gallimore, R. What a coach can teach a teacher. Psychology Today 9:75–78, 1976.