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RESEARCH NOTE • NOTE DE RECHERCHE

An Exploratory Examination of the Coaching Behavior Scale for Sport

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Qualitative research with coaches and athletes provided the theoretical base for the development of the Coaching Behavior Scale for Sport (CBS-S), an instrument that assesses coaching behaviors from athletes' perspective. Seventy five items derived from qualitative research with coaches and athletes were reduced to 37 following pilot testing. An exploratory factor analysis with 205 athletes revealed six sub-scales of the CBS-S, each with high internal consistency. The six sub-scales of the CBS-S were: (a) Technical Skills, (b) Goal Setting, (c) Mental Preparation, (d) Personal Rapport, (e) Physical Training and Planning, and (f) Negative Personal Rapport. The CBS-S was developed to benefit both research and interventions. The CBS-S can be used as a research tool to provide new and insightful data about coaches' behaviors. For interventions, the applied and grounded nature of the CBS-S makes it a suitable instrument to be used to evaluate coaches' performance.

Un questionnaire ayant pour but l'analyse des comportements des entraîneurs (CBS-S) a été développé à partir des résultats d'études qualitatives. La version originale de l'instrument était composée de 75 items. A partir des résultats d'une étude pilote, l'instrument a été réduit à 37 items. Une analyse factorielle exploratoire a dévoilée six facteurs, chacun avec une forte consistance interne.

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Les six facteurs sont (a) l'habileté technique, (b) la fixation d'objectifs, (c) la préparation mentale, (d) le rapport personnel, (e) la planification et l'entraînement physique et (f) le rapport personnel négatif. Le CBS-S peut être utilisé comme un instrument de recherche et d'intervention en science de l'entraînement.

Any coaching situation involves the interaction of three fundamental variables: the coach, the athlete, and their environment. Existing theoretical models of coaching (Chelladurai, 1984; 1993; Côté, Salmela, Trudel, Baria, & Russell, 1995; Smoll & Smith, 1984) have included these three variables when explaining the influence of coaches on athletes' development in sport. For instance, Smoll and Smith (1984) proposed a model to investigate coaching behaviors in youth sport. In addition to the coach, athlete, and environment variables, the model specifies that coach behaviors are influenced by player perception and recall, coach perception of players' attitudes and players' evaluative reactions. The Coaching Behavior Assessment System (CBAS; Smith, Smoll, & Hunt, 1977) is an observation instrument developed to investigate the relationships posited by Smoll and Smith's model. The CBAS, or its adaptations, have been used in several studies to examine coaches' influence on children's psychological development through sport. The CBAS includes 12 behavioral categories divided into eight reactive and four spontaneous coaching behaviors. The reactive category consists of the coaches' responses to either desirable performance or effort, mistakes and errors, or players' misbehaviors. The spontaneous categories are divided into relevant and irrelevant behaviors initiated by the coach. Studies using the CBAS, or an adapted version of the instrument, have shown that coach behavior has a significant influence on an athlete's psychological profile, affecting such characteristics as self-esteem, satisfaction, and perceived competence (e.g. Barnett, Smoll, & Smith, 1992; Smith, Smoll, & Curtis, 1978; Smith, Zane, Smoll, & Coppell, 1983). For a thorough review of the literature using the CBAS see Chelladurai and Reimer (1998).

A distinguishing feature of the CBAS is its focus on youth sport coaches. Research using the CBAS has provided specific guidelines to coaches and coach educators and has opened up other avenues for further analyses of the coach-athlete environment. However, the portrait drawn of coaches from research using the CBAS is incomplete and does not provide a thorough understanding of their work. For instance, important aspects of coaching behavior such as planning, working with assistants, or enhancing physical and mental skills are not assessed by the CBAS.

Another seminal contribution to the coaching literature was the development of the multidimensional model of leadership (Chelladurai, 1984; 1993) which has generated a large number of studies on coaching effectiveness. The central component of this model features three states of coaches' behaviors: actual behavior, coach behavior preferred by athletes, and required behavior. These are influenced by three "antecedent" variables; the characteristics of the coach, athletes, and situation. The model's main supposition is that the outcome, such as performance or satisfaction, is positively related to the degree of congruence among the three states of coach behavior. The Leadership Scale for Sport (LSS) was developed by Chelladurai and Saleh (1980) to test the relationships specified in the multidimensional model and the applicability of the model to the prediction of leadership effectiveness in sport. A detailed description of the Multidimensional Model of Leadership and the extensive program of research conducted with the LSS have been reviewed elsewhere (Chelladurai, 1990; Chelladurai, 1993; Chelladurai & Riemer, 1998).

Briefly, the LSS consisted of five dimensions of coaches' leadership behavior: (a) training and instructional behavior, (b) democratic behavior, (c) autocratic behavior, (d) social support behavior, and (e) rewarding behavior. These five dimensions of coaches' behavior were validated from items chosen and modified from an existing leadership scale used to assess managers' behaviors in formal organizations. The LSS was designed on the premise that sport teams are formal organizations and that coaches' behaviors are similar to managers' behaviors. Given its origins, it would be wise to verify if the LSS dimensions of coaches' behaviors represent what coaches actually do and what happens in an athletic setting. For instance, coaches have a very important leadership role in competition (Côté, Salmela, & Russell, 1995) and in organization (Côté & Salmela, 1996) neither of which are assessed by the LSS. In fact, in a discussion of issues and problems of studies using the LSS, Chelladurai (1990) suggested that "future research could focus on generating items based on the experiences and insights of both coaches and athletes" (p. 340).

Recently, researchers have focused on expert coaches using interviews and qualitative data analysis. Using a qualitative methodology, Côté, Salmela, Trudel, et al., (1995) provided a cognitive model of the process and variables involved in the development of athletes. They suggested that central to the coaching process are the coaches' behaviors in training, competition, and organizational settings. Affecting these three variables are the coach's personal characteristics, athletes' personal characteristics and level of development, and contextual factors. The main components of this model have been validated in a case study of an ice hockey coach (Gilbert & Trudel, 1997).

A critical issue relating to research on coaching is the lack of theoretical framework to underline the major variables affecting coaches' work. The

theoretical frameworks proposed by Smoll and Smith (1984), Chelladurai (1984) and Côté, Salmela, Trudel, et al. (1995) share common variables, however, they do not provide a comprehensive outline of all the factors that affect the coaching process. Côté (1998) recently integrated the different approaches used to study coaching and provided a basis for establishing a general theory of coaching. The Coaching Model was used as the framework under which variables that affect coaches' work were outlined and defined (Côté, 1998). In line with a comprehensive understanding of coaches' work, the Coaching Model (Côté, 1998; Côté, Salmela, Trudel, et al., 1995) served as a framework for the development of the Coaching Behavior Scale for Sport (CBS-S). Constructs and items of the scale were extracted from behaviors and strategies used by coaches in training, competition, and organizational settings (Bloom, 1996; Bloom, Durand-Bush, & Salmela, 1997; Côté & Salmela, 1996; Côté, Salmela, & Russell, 1995; Desjardins, 1996; Durand-Bush, 1996; Gilbert & Trudel, 1997; Sedgwick, Côté, & Dowd, 1997).

The training component of the Coaching Model included three categories: (a) mental preparation strategies, (b) technical skills, and (c) physical training. The organization component of the Coaching Model included the categories of: (a) planning, (b) goal setting, (c) recognition of individual differences, (d) personal rapport, (e) assistants, and (f) parents. Finally, one category entitled "competition strategies" represented the competition component of the coaching model. Qualitative data gained from coaches and athletes provided the context for item development in the CBS-S. The purpose of this exploratory article is to present some psychometric properties of the CBS-S.

Method

Phase One

Initially, 75 Items for the CBS-S were derived from a series of qualitative studies with coaches and athletes (Bloom, 1996; Bloom, Durand-Bush, & Salmela, 1997; Côté, 1998; Côté & Salmela, 1996; Côté, Salmela, & Russell, 1995; Côté, Salmela, Trudel et al., 1995; Desjardins, 1996; Durand-Bush, 1996; Gilbert & Trudel, 1997; Sedgwick, Côté, & Dowd, 1997) and input of colleagues at the Institut National du Sport et de l'Education Physique (INSEP; Fournier & Arripe-Longueville, 1996). These items were drafted into questionnaire format, and reviewed for readability and face validity by eight academics and three coaches. The questionnaire was then completed by 105 rowers (local club and secondary school rowers). Subjects were asked to respond to the stem "how frequently do you experience the following coaching behaviors?" by providing a rating on a scale from 1 (never) to 7 (always).

The items underwent an exploratory factor analysis, using an oblique rotation. Thirty seven items formed six factors in this analysis. They were described as Technical Skills (i.e., eight items about coaching feedback, demonstrations, and cues); Goal Setting (i.e., six items assessing the coach's involvement in the identification, development, and monitoring of goals); Mental Preparation (i.e., five items assessing the coach's involvement in helping the athlete be tough, stay focused, and be confident); Personal Rapport (i.e., seven items assessing the approachability, availability, and understanding of the coach); Physical Training and Planning (i.e., eight items about the coaches' provision of physical training and planning for training and competition) and Negative Personal Rapport (i.e. three items describing the coach's use of fear, yelling when angry, and disregarding the athlete's opinions). Therefore, these 37 items were retained for further development of the CBS-S.

Phase Two

Subjects. A larger and more diverse sample of athletes (N=205) was recruited for a second phase in CBS-S development. The convenience sample was composed of volunteers in the following sports: rowing (n=128), track and field (n=39), rugby (n=21), basketball (n=11), swimming (n=3), gymnastics (n=2), and ice hockey (n=1). The sample contained 94 males (45.6%) and 111 females (54.4%). The mean age (M=19.6 years) of the sample indicates a relatively young sample with some variability (SD=4.4 years), but predominantly the sample lies between 13 years and 25 years of age. The mean number of years in their present sport (M=11.02 years, SD=4.7 years) indicates the vast majority of subjects have been involved for a large proportion of their lives in the sport reported.

Analyses. The 37 items of the CBS-S were again submitted to an exploratory factor analysis, using an oblique rotation. Preliminary investigations of the reliability (internal consistency and test-retest reliability) and validity (factor validity) of the CBS-S were also conducted.

Results

The results of the factor analysis are presented in Table 1. The six factors emerging from the analysis were the same as the one obtained in the first phase of the study that is: (a) Negative Rapport, (b) Mental Preparation, (c) Goal Setting, (d) Personal Rapport, (e) Technical Skills, and (f) Physical Training and Planning. For each sub-scale, the items loaded clearly on one factor (i.e., no factorial complexity was exhibited) and although all items loaded on the other factors at less than .40, the large majority loaded .2 or less. Each factor had:

eigenvalues exceeding 1.0, accounted for significant variance beyond that of the other factors, and had high item loadings indicating strong factor validity. The six factor solution accounted for 79.8% of the total variance.

Table 1
Factor Loadings of the CBS-S Items

Item	Physical Training Planning	Technical	Personal Rapport	Goal Setting	Mental Preparation	Negative Rapport
	Factor Loadings					
Detailed Program	0.87					
Confident in Program	0.86					
Plan for Phys Prep	0.85					
Physically Challenging	0.84					
Annual Program	0.79					
Coordinates Training	0.78					
Coordinates Comp	0.74					
Structured Sessions	0.65					
Specific Feedback		0.82				
Feedback on Technique		0.82				
Reinforcement		0.82				
Provides Cues		0.80				
Demonstrations		0.78				
Uses Examples		0.75				
Immediate Feedback		0.71				
Asks Questions		0.70				
Easily Approachable			0.85			
Available			0.84			
Demonstrates Concern			0.80			
Good Listener			0.80			
Shows Understanding			0.75			
Maintains Confidentiality			0.73			
Trustworthy			0.73			
Helps me Set Specific Goals				0.80		
Helps Identify Strategies				0.79		
Helps Identify Target Dates				0.78		
Monitors my Progress				0.77		
Helps Set Goals				0.74		
Demonstrates Commitment				0.64		
Be Tough					0.83	
Perform Under Pressure					0.81	
Stay Confident					0.75	
Stay Positive					0.70	
Stay Focused					0.70	
Uses Fear						0.88
Disregards My Opinion						0.87
Yells When Angry						0.82
Eigenvalue	**17.64**	**3.77**	**2.67**	**2.12**	**1.70**	**1.61**
% of Total Variance	**47.7**	**10.2**	**7.2**	**5.7**	**4.6**	**4.4**

Total Variance Accounted For = 79.8%

For all factors N=205

The six constructs outlined in the first column of Table 2 demonstrate mean values in the mid-ranges of the 7 point scale upon which they were based. The negative rapport construct, as would be expected, is in the lower mid-range, while the other constructs are in the upper mid-ranges. The standard deviations of the constructs demonstrate adequate variability, that is, they are not restricted in range nor do they demonstrate obvious ceiling or floor effects.

Table 2
CBS-S Construct Inter-correlations and Reliabilities

	M	SD	1	2	3	4	5	Alpha	Test-retest
1. Physical Training & Planning	4.81	1.74						.96	.80
2. Technical Skills	4.62	1.43	.47***					.95	.68
3. Personal Rapport	4.87	1.65	.56***	.50***				.95	.90
4. Goal Setting	4.01	1.78	.64***	.62***	.57***			.97	.68
5. Mental Preparation	4.82	1.70	.53***	.62***	.56***	.65***		.95	.80
6. Negative Rapport	2.83	1.71	- .05	.16*	- .05	.15*	.16*	.85	.79

Test-retest, N=67; for all other statistics N=205; and * = .05 level, ** = .01 level, *** = .001 level

The factor inter-correlations are also presented in Table 2. Among the positive factors there are moderate significant correlations. Each positive factor is weakly and in three cases significantly correlated with the negative factor (negative personal rapport). At first glance, the significant positive correlation of negative rapport with some of the positive CBS-S constructs may appear surprising. However, the shared variance with the positive CBS-S constructs is very low (no greater than 2.6%) which lends support to the conclusion that the negative construct is considerably different from the positive constructs. Furthermore, many coaches use psychological strategies, or tactics, such as intimidation, fear, and/or yelling at their players to exhort them to higher performance. Because coaches use all the tactics at their disposal and these include both positive and negative means, finding low positive correlations among negative and positive constructs is a reasonable expectation. The low positive correlations found in the present exploratory study support this possibility and, in fact, indicate the need for further investigations of this phenomenom. For instance, it is quite possible that effective coaches use different proportions of negative and positive behaviors compared to less effective coaches.

As might be expected, the largest inter-correlation exists between mental preparation and goal setting (r=.65). However, the amount of shared variance for these two factors is only 42.3% (r^2=.423) indicating sufficient discrimination between these constructs. Similarly, since the remaining intercorrelations are

smaller, all other combinations of constructs demonstrate stronger discrimination.

Reliability

Two forms of reliability are reported. The first, internal consistency, is measured by Cronbach alpha-coefficients and based on the study sample (i.e., *N*=205). The coefficients are reported in the second-to-last column of Table 2 and all constructs demonstrate very high internal consistency with alpha coefficients of .85 or greater.

The last column of Table 2 describes test-retest reliability results, but is based on a small and different convenience sample (*N*=67) of university athletes. The test-retest interval was three weeks. Each of the positive constructs demonstrates adequate test-retest reliability. The Negative Personal Rapport construct was lowest at r=.49.

Discussion

These results provide evidence that the CBS-S has an acceptable degree of rigor in a number of key psychometric properties. First, the retained constructs conform closely to the qualitative studies upon which they were based – a form of external validity. Second the constructs demonstrate adequate variability, indicating they capture a wide range of coaching behaviors exhibited across a variety of sports. Third, the constructs possess reasonable validity (factor and discriminant) and reliability (internal consistency and test-retest reliability). These exploratory key results indicate that the CBS-S, though still in development, offers a useful addition to existing theoretical and applied coaching instruments.

Some caution, however, is necessary regarding the lower test-retest reliability coefficient (r= .49) for the "negative rapport" construct. One possible explanation of the lower test-retest reliability for negative coaching behaviors is that they occur with different frequency and consistency than positive behaviors. For instance, it is clear from the lower mean frequency of the negative construct in Table 2 that negative coaching behaviors occur considerably less frequently than positive behaviors. Negative coaching behaviors might more frequently occur in specific situations, (e.g., where athletes, or teams, do not perform well). Therefore, when athletes report the frequency of negative coaching behaviors, for two different time periods, it is probable that those behaviors would be less highly correlated than more commonly occuring positive behaviors. Greater numbers of athletes need to be tested to establish the legitimacy of these hypotheses.

The two most widely used psychometric instruments to measure coaching behavior are the CBAS and the LSS. One of the distinguishing features among the CBS-S, LSS and CBAS is the manner in which coaching behavior is measured. Direct observation is used with the CBAS and paper-and-pencil methods are used with the CBS-S and LSS. The CBS-S measures important dimensions of coaching that are not taken into account by the LSS and the CBAS including Mental Preparation, Goal Setting, Personal Rapport, and Negative Rapport. On the other hand, by tapping into the decision making dimensions of coaches' autocratic and democratic behavior the LSS measures coaching constructs that are not measured by the CBS-S and the CBAS. However, several studies have reported low internal consistency for the autocratic sub-scale of the LSS (e.g. Gordon, 1988; Spink, 1996).

While the LSS has mostly been administered to adults the CBAS was designed to evaluate coaches' behaviors in youth sport (Chelladurai & Riemer, 1998). The objective behind the development of the CBS-S was to provide a measurement instrument that closely represented coaching behaviors in various sports, at various levels. Unlike the LSS and CBAS which were developed from theories of leadership, the CBS-S is grounded in coaches' and athletes' experiences. The CBS-S provides information to coaches, researchers, and sport administrators on aspects of coaching behaviors identified by athletes and coaches as essential components of successful coaching.

This study is part of an ongoing attempt to develop a valid scale for assessing coaching behaviors. The CBS-S was developed to be beneficial both for research and intervention purposes. For research, the CBS-S provides information about coaches and athletes that cannot be tapped with other existing instruments. However, the various sub-scales of the CBS-S need to be related to specific variables such as athletes' motivation, satisfaction, confidence, and performance. It is important that the predictive validity of the CBS-S constructs be verified for a wide variety of outcomes. As well, cross-cultural validation studies of the CBS-S should be carried out. Efforts in this direction are presently being carried out by colleagues at INSEP (Paris, France), and by colleagues in Singapore, Japan, and the United States. The CBS-S could also be used in conjunction with other methods of data collection, such as observation and interviews of coaches and athletes. Also, a larger number of coaches from various sports and levels should be investigated using the CBS-S. Finally, a confirmatory factor analysis should be conducted with a larger pool of subjects in order to estimate the extent to which the present modelled constructs fit the original structure of the CBS-S.

In summary, coaches have a unique opportunity to make significant changes in athletes' lives. The CBS-S can be used as a research tool to provide new and insightful data about coaches' behaviors. The CBS-S offers dimensions of

coaching behaviors that have been identified by both coaches and athletes as being important aspects of coaches' performance and effectiveness. As an intervention tool, the CBS-S measures various dimensions of coaching behaviors that could be used to assess coaches' work. Ongoing coaching research and intervention with the CBS-S and other methods and instruments is necessary to provide athletes with an optimal learning environment.

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