Coach-Athletes Communication: Data from the Communication Behaviors Evaluation System

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Palavras-chave
Comunicação de treinadores, Desempenho, Treinadores, Liderança.

RESUMO

Este estudo analisa a comunicação entre treinadores e atletas, utilizando o Sistema de Avaliação de Comportamentos de Comunicação (SACC). Este sistema proporciona uma perspetiva ampla das interações entre treinadores e atletas, considerando a perspetiva de ambos e de observadores. Os comportamentos foram avaliados através do Questionário de Comportamentos Comunicacionais (QCC), versão para treinador, atletas e observador. O estudo incluiu 64 atletas de futsal masculino, com idades entre 13 e 43 anos (M = 18.98, DP = 7.05) e os seus treinadores, do sexo masculino, com idades entre 29 e 43 anos (M = 35.75, DP = 5.26). Os resultados revelaram seis aspetos: (1) o CBQ assumiu uma estrutura de dois fatores (comportamentos positivos e negativos), mas um item foi suprimido; (2) os treinadores assumiram comportamentos positivos com mais frequência do que comportamentos negativos; (3) os comportamentos espontâneos positivos foram ligeiramente mais frequentes do que os comportamentos reativos positivos; (4) os treinadores avaliaram-se como apresentando mais comportamentos reativos negativos do que comportamentos espontâneos negativos; (5) feedback positivo e incentivo após insucesso foram os comportamentos positivos mais frequentes; (6) feedback negativo foi o comportamento negativo mais frequente. O SACC assumiu-se como uma ferramenta útil para avaliar a comunicação entre treinadores e atletas.

Keywords
Coaches' communication, Performance, Sports coaches, Sports leadership.

ABSTRACT

This study analyzes coach-athletes' communication using the Communication Behaviors Evaluation System (CBES). This system provides a broad and complete perspective regarding the interactions between coaches and athletes by including data from coaches, athletes and from an observer. The CBES was used to monitor the communication between coaches and athletes from four different teams, during one game (observation). Athletes and coaches evaluated their communication behaviors using the Communication Behaviors Questionnaire (CBQ). The study included sixty-four futsal male athletes aged between 13 and 43 years-old (M = 18.98, SD = 7.05) and their coaches, all male and aged between 29 and 43 years-old (M = 35.75, SD = 5.26). Results revealed six important aspects: (1) the CBQ assumed a two-factor structure of positive and negative behaviors but one item has deleted; (2) coaches assumed positive behaviors more frequently than negative behaviors; (3) positive spontaneous behaviors were slightly more frequent than positive reactive behaviors; (4) coaches perceived themselves as displaying more negative reactive behaviors than negative spontaneous behaviors; (5) positive feedback and encouragement after failure were the most frequent positive behaviors; and (6) negative feedback was the most frequent negative behavior. In sum, CBES assumed to be a useful tool to evaluate coaches-athletes' communication.

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Introduction

Coaches' ability to communicate in an effective way is critical because almost all tasks involved in leading athletes require high communication skills from coaches. In fact, they need to effectively communicate to be able to transmit their goals and philosophy of coaching to athletes, both in training sessions and during competitions. Equally important, coaches' ability to communicate promotes on athletes the perception that the coach is trustworthy and respectful (Jowett & Felton, 2013). Because of that, researchers still dedicate a significant amount of effort to explain the communication process between coaches and athletes.

In a review of coaching science research from 1970 to 2001, Gilbert and Trudel (2004) concluded that the study of coaching behavior was the main area under investigation, including systematic observation methods of coaching behaviors. McKenzie and van der Mars (2015) argue that systematic observation of coaching behaviors offers enormous potential by delivering contextually rich information about coach-athletes' interactions. A more recent systematic review of observation methods in coaching research between 1997 and 2016, identified 26 studies using several instruments, reporting that the most common were the Arizona State University Observation Instrument (ASUOI) and the Coach Analysis Intervention System (CAIS) (Cope, Partington, & Harvey, 2017).

In the Arizona State University Observation Instrument, the categories of pre-instruction, concurrent instruction, and post instruction represented 55% of all the recorded behavioral intervals (Potrac, Jones, & Cushion, 2007). On the other hand, the Coach Analysis and Intervention System (CAIS) developed by Cushion and colleagues (2012) is a multidimensional and hierarchical analysis system that identifies specific behaviors occurring in complex coaching environments. This system allows to evaluate 23 primary behaviors related to physical behavior, feedback/reinforcement, instruction, verbal/non-verbal, questioning, and management.

Another coding system extensively used in literature of youth sports coaching is the Coach Behavior Assessment System (CBAS) developed by Smith, Smoll, and Hunt (1977) which evaluates the behaviors of athletic coaches in naturalistic settings. The system consists of 12 behavioral categories derived from content analyses of coaching behaviors during practices and games. The behaviors are subdivided into reactive and spontaneous categories: reinforcement and nonreinforcement are behaviors that occur in response to positive behaviors or effort of athletes; mistake contingent technical instruction, mistake-contingent encouragement, punishment, punitive technical instruction, and ignoring mistakes occur in response to athletes' mistakes and errors; and keeping control occurs as response to their misbehaviors. Spontaneous behavioral categories included general technical instruction, general encouragement, organization, and general communication (Cumming, Smith, & Smoll, 2006).

More recently, Turnnidge and Côté (2019) developed a systematic observation instrument called Coach Leadership Assessment System (CLAS), which aims at examining coaches' leadership behaviors in sports. This system consists of 18 behavioral categories across five higher-order dimensions: transformational (11 codes), transactional (2 codes), neutral (1 code), laissez-faire (1 code), and toxic (2 codes) coaching, as well as one non-codable category.

All in all, these coding systems reinforce the need to continue evaluating coach and athletes' interactions for two main reasons. First, these systems provide useful information about coaches' "communication profiles" that can be related to measures of wellbeing and performance of athletes, answering to the question "Are there optimal and suboptimal profiles of coaches' communication?" Second, they also offer useful information about how to educate coaches to assume the role of coaching, answering to the question "What communication behaviors should be included in coaching educational programs?"

In this study, we aim to extend current knowledge on coaches and athletes communication by evaluating the communication behaviors of four coaches and respective athletes. For that, we propose, for the first time, the Communication Behaviors Evaluation System (CBES) that evaluates 16 communication behaviors, divided into two axes: (a) impact axis: includes positive behaviors and negative behaviors, and (b) initiative axis: includes spontaneous and reactive behaviors (see Figure 1). The impact axis encompasses behaviors that can facilitate or debilitate the communication between two or more people, while the initiative axis encompasses behaviors that are first delivered by one person and behaviors that are delivered by one person in response to others' behaviors.

The definition of the 16 proposed behaviors is displayed on Figure 2. Our system tries to improve current knowledge on communication behaviors in five aspects: (i) the proposed behaviors are very substantial, expanding the focus on technical behaviors assumed by leaders, particularly in sport context; (ii) the proposed behaviors are very wide, including transformational behaviors (as, for, example, positive vision) and transactional behaviors (as for, example, positive feedback) that have been established in literature as important dimensions to explain leaders behaviors (Gomes, 2014); (iii) the proposed behaviors evaluate potential negative behaviors assumed by leaders in a very descriptive way, by including six behaviors; (iv) the proposed behaviors allow to better comprehend the magnitude of interactions that facilitate or debilitate the

communication process; (v) the proposed behaviors allow to better comprehend the magnitude of interactions that are initiated or responded by the leader; and (vi) the proposed behaviors are evaluated from the perspective of the leaders, the followers, and from the observer point of view.

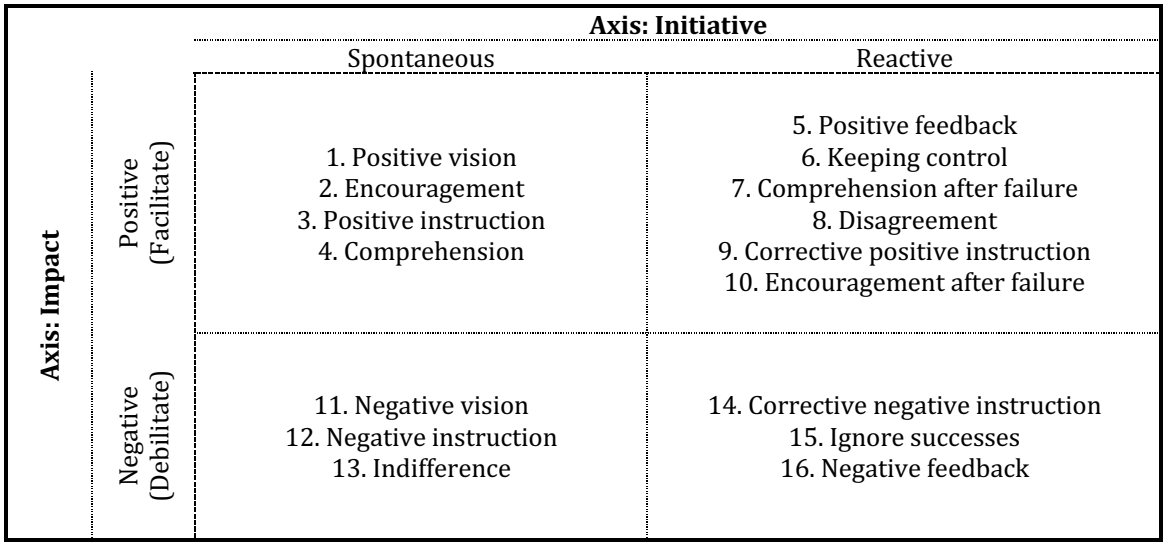

Figure 1. *Axes of the Communication Behaviors Evaluation System (CBES).*

The CBES was used in this study for the first time to evaluate the behaviors assumed by four coaches of athletes in different age groups, from young to adult athletes. We evaluate four teams in order to augment the magnitude of data collection and to analyze potential changes on communication behaviors according to the ages of athletes. Specifically, our study has three goals: (a) Testing the structure of the coding system of behaviors evaluated in the CBES; (b) Analyzing the magnitude of each behavior included in the CBES, by using three distinct sources of information (coach, athletes, and observation); and (c) Analyze the fluctuations on perceived performance of coaches and athletes, and relate the date with communication behaviors included in the CBES.

Communication behaviors of the CBES
1. Positive vision: communication centered on optimism regarding what can be achieve.
2. Encouragement: communication centered on incentivizing success and improvement.
3. Positive instruction: communication centered on focusing on what needs to be improved.
4. Comprehension: communication centered on focusing on understanding ideas, expectations, and desires of others).
5. Positive feedback: communication centered on reinforcing and recognizing others' efforts.
6. Keeping control: communication centered on reestablishing order and calmness.
7. Comprehension after failure: communication centered on understanding ideas, expectations, and desires of others following failure or uncomfortable situation.
8. Disagreement: communication centered on assertive and respectful statement of disagreement.
9. Corrective positive instruction: communication centered on corrective but positive instruction after a failed action.
10. Encouragement after failure: communication centered on support and incentive following a failed action.
11. Negative vision: communication centered around pessimism regarding what can be achieved.
12. Negative instruction: communication centered on what needs to be avoided or not done.
13. Indifference: communication centered on ignorance or limiting the expression of ideas, expectations, or desires.
14. Corrective negative instruction: communication centered on corrective and negative instruction that follows a failed action.
15. Ignore successes: communication centered on failing to recognize or devaluating others' efforts.
16. Negative feedback: communication centered on showing disapproval and/or irritation.

Figure 2. *Definition of the CBES' Communication behaviors.*

Methods

Participants

This study included sixty-four futsal male athletes of one club in Madeira Island, Portugal. Athletes were aged between 13 and 43 years-old (M = 18.98, SD = 7.05) and belonged to four different teams (all in the Regional Honor Division), according to their age group (cf. Table 1). Their number of practice years ranged between 1 and 15 years (M = 4.58, SD = 3.78), and their titles between 0 and 1 (M = 0.11, SD = 0.32). Athletes respective coaches also agreed to participate in the study. Only 23% of athletes were playing futsal with their respective coach for more than 1 year (M = 1.30, SD = 0.58), and only seven athletes of Team 3 achieved a title with the current coach. Coaches' profiles are displayed in Table 2. All coaches were male, aged between 29 and 43 years-old (M = 35.75, SD = 5.26).

Table 1. *Athletes Demographic Characteristics*

	Team 1 U15	**Team 2 U17**	**Team 3 U19**	**Team 4 Adults**
Number of athletes	18	16	16	14
Age range	13-15	15-17	17-20	20-43
Age (*M; SD)*	13.67 (0.69)	15.75 (0.86)	18.19 (0.91)	30.43 (6.70)
Practice years (*M; SD)*	2.72 (1.45)	2.75 (1.44)	4.19 (2.56)	9.50 (4.60)
N of years with current coach (*M; SD)*	1 (0.00)	1 (0.00)	1.69 (0.87)	1.57 (0.51)
Current championship ranking	2nd place	1st place	2nd place	2nd place

Table 2. *Coaches Demographic Characteristics*

	Team 1 U15	**Team 2 U17**	**Team 3 U19**	**Team 4 Adults**
Age	29	33	38	43
Number of years as futsal coach	1	1	10	2
Number of years coaching the current team	1	1	5	2

Procedure

Once permission was obtained from the club, the second author – who was responsible for data collection – met with each team and their respective coaches to explain the aim of the study and to collect their individual consent. Legal guardians of underage athletes were also contacted to provide consent. The study included a multidimensional approach. On one hand, subjective data were collected through self-reported questionnaires completed by both athletes and coaches. Athletes completed a short questionnaire assessing their coach typical communication behaviors throughout the season, as well as their perceptions regarding their individual and collective performance during the season; whilst coaches fulfilled a short questionnaire indicating their perceptions regarding their typical communication behaviors throughout the season and their perceptions on the team's collective performance during this period. On the other hand, a more objective measure was used to evaluate coaches' communicational behavior – specifically, their communication behavior during a match was registered using an observation sheet.

The futsal seasons in Portugal occur from October-June and data were collected in February. Coach and athletes filled out the instruments independently, thinking about the communication behaviors assumed by coaches until that moment. Then, coaches received a training workshop on leadership and communication behaviors between the completion of the self-reported questionnaires (which occurred before) and their game observation (which occurred after this training). Finally, the observation occurred during only one game after coaches' workshop. The original plan for this study was a longitudinal design with several evaluations of coaches' communication behaviors. Thus, the idea was that coaches received continuous feedback and training on leadership and communication throughout the season to increase their positive communication behaviors and decrease the frequency of negative behaviors. However, due to COVID-19 pandemic, this was not possible and, because the season ended

earlier, data was collected only once (cross-sectional study).

Instruments

Communication Behaviors Questionnaire (CBQ; Gomes, 2019). The CBQ evaluates coaches' communication behaviors into different behaviors based on two axes: (a) initiative, which refers to whether the communication was initiated by the individual (*spontaneous*) or as a response/result of a communication behavior assumed by another person (*reactive*); (b) impact of communication that can be either positive or negative. The intersection of initiative and impact results on 16 communication behaviors, organized on four dimensions. Dimension one refers to spontaneous positive communication behaviors and includes (1) positive vision: communication centered on optimism regarding what can be achieved; (2) encouragement: communication centered on incentivizing success and improvement; (3) positive instruction: communication centered on focusing on what needs to be improved, and; (4) comprehension: communication centered on focusing on understanding ideas, expectations, and desires of others. Dimension two refers to reactive positive communication and includes: (5) positive feedback: communication centered on reinforcing and recognizing others' efforts; (6) keeping control: communication centered on reestablishing order and calmness; (7) comprehension after failure: communication centered on understanding ideas, expectations, and desires of others following failure or uncomfortable situation, (8) disagreement: communication centered on an assertive and respectful statement of disagreement, (9) corrective positive instruction: communication centered on corrective but positive instruction after a failed action, and (10) encouragement after failure: communication centered on support and incentive following a failed action. Dimension three refers to spontaneous negative communication and includes: (11) negative vision: communication centered around pessimism regarding what can be achieved; (12) negative instruction: communication centered on what needs to be avoided or not done, and; (13) indifference: communication centered on ignorance or limiting the expression of ideas, expectations, or desires. Finally, Dimension four refers to reactive negative communication, and includes (14) corrective negative instruction: communication centered on corrective and negative instruction that follows a failed action; (15) ignore successes: communication centered on failing to recognize or devaluating others' efforts, and; (16) negative feedback: communication centered on showing disapproval and/or irritation. This instrument can be applied in two different ways. The first one is as a self-report questionnaire, in which participants rate their agreement (1 = completely disagree, 5 = completely agree) with sixteen different statements, one for each communication behavior. The coaches completed this version self-assessing their behavior throughout the season, and athletes answered assessing their coaches' behavior. The second version of the application refers to the assessment of these behaviors through observation. Therefore, an experienced observer completed the observation spreadsheet. Exploratory Factor Analysis (with principal component factor analysis) with Varimax rotation revealed two dimensions related to the positive and negative impacts of communication (*KMO* = .764; *Bartlett's Test* = 564.224, *df* = 105, $p <$ .001; Explained variance = 56%). However, this solution was achieved after deleting item 11 of negative vision due to double saturation in both factors. This item was removed from the analysis of athletes and coaches' results (for congruence sake) but not from observation results because the methodology of data collection was different in this last case. Alpha values were acceptable for positive (α = .90) and negative (α = .83) dimensions of communication behaviors.

Sport Performance Perception Questionnaire (SPPQ; Gomes, 2016). The SPPQ was used to evaluate perceptions regarding sport performance. Athletes rated their agreement (1 = completely disagree, 5 = completely agree) with 10 different statements regarding their perceptions of their individual (5 items, e.g., "I had the performance I wanted", α = .86) and collective performance (5 items, e.g., "The team had the performance we wanted", α = .80) throughout the season. Coaches answered only to the collective performance dimension. Exploratory Factor Analysis (with principal component factor analysis) with Varimax rotation, revealed two dimensions related to perceptions of individual and collective performance (*KMO* = .822; *Bartlett's Test* = 286.285, *df* = 45, $p <$ .001; Explained variance = 61%). Alpha values were acceptable for individual (α = .86) and collective (α = .80) dimensions of SPPQ.

Results

Data Analysis Strategy

When comparing athletes' perceptions among the different coaches' communication behaviors and their sport performances, paired-sample *t-tests* and repeated-measures ANOVAs were conducted (as the normality assumption was not violated: $-0.34 > sk < 1.89$, $-0.21 > k < 3.25$; cf. Kline, 2011). When comparing athletes' perceptions across teams, Kruskal-Wallis test was conducted due to the low *n* of athletes in each team. Only results with a *p*-value below .05 after Bonferroni corrections are reported as significant. However, no statistical tests were conducted when comparing coaches and athletes' perceptions, coaches' perceptions across teams, or observations across teams, as no sufficient *n* was

collected (4 coaches, 1 observation). Thus, conclusions were cautiously drawn from the averages.

Coaches' Overall Communication Behaviors

According to athletes' perceptions, coaches presented positive behaviors more frequently than negative behaviors [$M_{positive}$ = 4.40, SD = 0.78; $M_{negative}$ = 1.53, SD = 0.94, t (63) = 20.48, p < .001, g = 4.35]. This is consistent with both coaches' perceptions ($M_{positive}$ = 4.25, SD = 0.68; $M_{negative}$ = 1.85, SD = 0.68), and with the observation ($M_{positive}$ = 15.01%, $M_{negative}$ = 3.54%). When examining the four dimensions of the communication behavior, both athletes and coaches presented the same pattern by perceiving the positive spontaneous behaviors as slightly more frequent than the positive reactive behaviors; however, the repeated-measures ANOVA showed that this difference was not statistically significant for athletes [athletes: $M_{spontaneous}$ = 4.44, SD = 0.77, $M_{reactive}$ = 4.37, SD = 0.80; F(1,63) = 326.17, p < .001, ηp2 = .838; $p_{post\text{-}hoc}$ = 1.00; coaches: $M_{spontaneous}$ = 4.38, SD = 0.62, $M_{reactive}$ = 4.17, SD = 0.72]. These perceptions are in accordance with the observation ($M_{spontaneous}$ = 9.12%, $M_{reactive}$ = 7.06%). Regarding the negative behaviors, athletes perceived a similar prevalence of negative spontaneous and reactive communication behaviors ($M_{spontaneous}$ = 1.56, SD = 0.96; $M_{reactive}$ = 1.51, SD = 0.92, $p_{post\text{-}hoc}$ = 1.00). On the other hand, coaches' perceptions perceive themselves as displaying more negative reactive (M = 2.08, SD = 0.95) than negative spontaneous behaviors (M = 1.50, SD = 0.50), which is supported by the observation ($M_{reactive}$ = 4.31%; $M_{spontaneous}$ = 2.76%).

When looking specifically to the means of positive behaviors, athletes and coaches have similar perceptions: both perceived reactive behaviors as more frequent, specifically positive feedback and encouragement after failure as some of the more frequent behaviors (athletes added the corrective positive instructions, while coaches perceived more encouragement (cf. Table 3). Both athletes and coaches also perceived keeping control as the least frequent positive behavior. The results of the observation (cf. Table 4) point out that, indeed, positive feedback is one of coaches' more frequent communication behaviors. However, the other top two behaviors referred to encouragement (which is in accordance with coaches' perceptions) and positive instruction, whilst the least frequent positive behaviors referred to comprehension, disagreement and comprehension after failure. Athletes' perceptions regarding coaches' negative communication behavior are very similar, slightly highlighting negative feedback as more frequent. Coaches agreed with this perception and considered negative feedback a somewhat frequent communication behavior (cf. Table 3). Coaches perceptions are supported by the observation, as over 7% of coaches' communication behavior refer to negative feedback (cf. Table 3).

Coaches' Communication Behavior: Differences Among Teams

The observation results showed that, regarding positive spontaneous behaviors, encouragement was the most frequent communication behavior displayed by coaches across the four teams. This result is consistent with athletes' and coaches' perceptions for Team 1 and Team 2, as both athletes and coaches perceived encouragement as the most frequent behavior. In Team 3, athletes perceived positive instruction and coaches positive vision as the more frequent behavior displayed by the coach, contradicting the observation results. In Team 4, a different pattern arises: both athletes and the coach perceived comprehension as the more frequent behavior; however, the coach of this team equally highlights the display of encouragement (cf. Table 4). It is important to note that, across teams, only one difference arises as statistically significant: Athletes from Team 1 athletes perceived encouragement as more frequent than athletes from Team 4, H (3) = 11.93, p = .008, $p_{post\text{-}hoc}$ = .033 (all other H < 7.62, p > .055).

Regarding positive reactive behaviors, the observation results showed that positive feedback is the most common communication behavior displayed by the coaches of Team 1, 2 and 3; while for the Team 4 coach, keeping control and corrective positive instruction appeared more often. Team 1 athletes have a consistent perception with the observation; however, their coach perceived comprehension and encouragement after failure as more common behaviors, which is not in accordance with the observation and his athletes' perceptions. On Team 2, coaches perceived positive feedback (alongside with encouragement after failure and corrective positive instruction) as the most frequent behavior they display, which is aligned with the observation, while his athletes perceived comprehension after failure and corrective positive instruction as more frequent communication behaviors of their coach. A discrepancy between athletes' and coach's perception also happens with Team 3: while the coach referred positive feedback as the most frequent behavior (perception supported by the observation), athletes referred corrective positive instruction and encouragement after failure. In Team 4, both athletes and coach perceived disagreement and encouragement after failure as the more frequent behaviors, contradicting the observation results. When comparing athletes' perceptions across teams, a difference between Team 1 and Team 4 arises again, as the former perceives positive feedback as more frequent than the latter [H(3) = 8.56, p = .036, $p_{post\text{-}hoc}$ = .024, all other H < 6.58, p > .087].

Table 3. *Athletes and coaches' communication behaviors*

Communication behaviors	**Team 1 U15** *M(SD)*		**Team 2 U17** *M(SD)*		**Team 3 U19** *M(SD)*		**Team 4 Adults** *M(SD)*		**Total average** *M(SD)*	
	Athletes	Coach	Athletes	Coach	Athletes	Coach	Athletes	Coach	Athletes	Coaches
Positive: Spontaneous										
1. Positive vision	4.72(0.46)	4.00(.00)	4.56(0.73)	4.00(.00)	4.19(0.83)	5.00(.00)	4.21(0.58)	4.00(.00)	4.44(0.69)	4.25(0.50)
2. Encouragement	4.83(0.38)	5.00(.00)	4.75(0.45)	5.00(.00)	4.19(0.91)	4.00(.00)	4.14(0.86)	5.00(.00)	4.50(0.74)	4.75(0.50)
3. Positive instr.	4.67(0.59)	4.00(.00)	4.75(0.45)	5.00(.00)	4.31(0.79)	4.00(.00)	4.29(1.07)	4.00(.00)	4.52(0.76)	4.25(0.50)
4. Comprehension	4.50(0.71)	5.00(.00)	4.56(0.63)	4.00(.00)	3.69(1.08)	3.00(.00)	4.43(0.77)	5.00(.00)	4.30(0.88)	4.25(0.96)
Positive: Reactive										
5. Positive feed.	4.89(0.47)	4.00(.00)	4.62(0.62)	5.00(.00)	4.31(0.95)	5.00(.00)	4.36(0.63)	5.00(.00)	4.56(0.71)	4.75(0.50)
6. Keeping cont.	4.22(0.94)	3.00(.00)	3.56(0.96)	4.00(.00)	3.81(0.91)	3.00(.00)	4.07(0.73)	4.00(.00)	3.92(0.91)	3.50(0.58)
7. Comprehe. after failure	4.56(0.71)	5.00(.00)	4.69(0.60)	4.00(.00)	4.06(1.00)	4.00(.00)	4.14(0.86)	4.00(.00)	4.37(0.83)	4.25(0.50)
8. Disagreement	4.33(0.84)	4.00(.00)	4.31(0.79)	4.00(.00)	3.94(1.12)	2.00(.00)	4.50(0.65)	5.00(.00)	4.27(0.88)	3.75(1.26)
9.Corrective positive instruct.	4.78(0.55)	4.00(.00)	4.69(0.48)	5.00(.00)	4.38(0.72)	4.00(.00)	4.29(1.07)	4.00(.00)	4.55(0.73)	4.25(0.50)
10. Encourag. after failure	4.72(0.67)	5.00(.00)	4.50(0.73)	5.00(.00)	4.38(0.81)	3.00(.00)	4.50(0.65)	5.00(.00)	4.53(0.71)	4.50(1.00)
Negative: Spontaneous										
12. Negative instru.	1.39(0.70)	2.00(.00)	1.69(1.25)	1.00(.00)	1.75(1.06)	2.00(.00)	1.43(0.65)	2.00(.00)	1.56(0.94)	1.75(0.50)
13. Indifference	1.22(0.73)	1.00(.00)	1.56(1.21)	1.00(.00)	2.06(1.12)	2.00(.00)	1.36(0.50)	1.00(.00)	1.55(0.97)	1.25(0.50)
Negative: Reactive										
14.Corrective negative instru.	1.44(1.04)	3.00(.00)	1.56(1.09)	2.00(.00)	1.88(1.02)	1.00(.00)	1.21(0.43)	1.00(.00)	1.53(0.96)	1.75(0.96)
15. Ignore success.	1.39(1.04)	1.00(.00)	1.44(1.03)	2.00(.00)	1.56(0.89)	1.00(.00)	1.21(0.58)	1.00(.00)	1.41(0.90)	1.25(0.50)
16. Negative feed.	1.61(1.09)	3.00(.00)	1.63(0.81)	4.00(.00)	1.88(1.02)	4.00(.00)	1.14(0.36)	2.00(.00)	1.58(0.91)	3.25(0.95)

Table 4. *Coaches behaviors: Observation results*

Coaches' communication behaviors	Team 1 U15 (*n*; %)	Team 1 U17 (*n*; %)	Team 3 U19 (*n*; %)	Team 4 Adults (*n*; %)	Average (*n*; %)
Spontaneous (positive)					
1. Positive vision	7.59%	10.85%	6.45%	7.61%	8.12%
2. Encouragement	11.72%	11.63%	10.48%	13.04%	11.72%
3. Positive instruction	11.03%	10.08%	11.29%	9.78%	10.55%
4. Comprehension	6.21%	6.98%	5.65%	5.43%	6.07%
Reactive (positive)					
5. Positive feedback	12.41%	10.85%	12.90%	7.61%	10.94%
6. Keeping control	4.14%	5.43%	5.65%	9.78%	6.25%
7. Comprehension after failure	4.83%	3.88%	3.23%	4.35%	4.07%
8. Disagreement	4.14%	6.98%	7.26%	5.43%	5.95%
9. Corrective positive instruction	4.83%	6.20%	8.06%	9.78%	7.22%
10. Encouragement after failure	8.97%	7.75%	7.26%	7.61%	7.90%
Spontaneous (negative)					
11. Negative vision	2.07%	2.33%	4.03%	1.09%	2.38%
12. Negative instruction	6.90%	3.88%	1.61%	2.17%	3.64%
13. Indifference	2.07%	2.33%	2.42%	2.17%	2.25%
Reactive (negative)					
14. Corrective negative instruction	3.45%	1.55%	4.84%	3.26%	3.27%
15. Ignore successes	1.38%	1.55%	3.23%	3.26%	2.35%
16. Negative feedback	8.28%	7.75%	5.65%	7.61%	7.32%

The observation showed that negative instruction was the most frequent spontaneous negative communication behavior in coaches of Team 1, 2 and 4. This behavior is particularly salient in Coach of Team 1, while negative vision appeared more often in the Team 3 coach. Even though the overall perceived frequency of these type of behaviors is low for both coaches and athletes (all $M < 2.01$), negative instruction was perceived by athletes and coaches of all teams as appearing slightly more often, except for Team 3, in which athletes perceived indifference as being displayed by the coach more often than negative instruction. Interestingly, when looking at differences across teams, Team 3 athletes perceived indifference as significantly more often displayed than athletes from Team 1 [H (3) = 9.26, p = .026, $p_{\text{post-hoc}}$ = .035; negative instruction: $H(3) = 1.10$, p = .777]. Finally, regarding negative reactive communication behaviors, the observation results showed that negative feedback was the most frequent behavior coaches displayed across the four teams. With the exception of the coach of Team 4, who does not perceive himself to behave this way, all coaches believed that they provide negative feedback to athletes more often than what athletes perceive it. Particularly, coaches of Team 2 and 3 considered that they displayed negative feedback quite often, which contradicts their athletes' perceptions. There are no

statistically significant differences in athletes' perceptions of coaches negative reactive communication behaviors across teams (all $H < 5.76$, $p > .124$).

Teams' and Coaches' Performance Perceptions

When looking to athletes' perceptions regarding their individual and collective performance, it can be concluded that they perceived collective performance as higher than individual performance [$M_{collective}$ = 3.95, SD = 0.91; $M_{individual}$ = 3.67, SD = 1.03, t (63) = 3.23, p = .002, g = 0.38], and this pattern was consistent across the four teams (cf. Table 5). Differences between teams regarding individual [F (3,60) = 0.94, p = .430] and collective performance are not significant [F (3,60) = 0.85, p = .471]. Interestingly, athletes' perceptions of their collective performance are inferior (M = 3.95, SD = 0.91) to the respective team coach (M = 4.15, SD = 0.91), with exception of the coach of Team 4, in which athletes and coach present the same score.

Table 5. *Athletes and coaches sport performance perceptions*

SPPQ Sport Performance Perceptions	**Team 1 U15** *M(SD)*	**Team 2 U17** *M(SD)*	**Team 3 U19** *M(SD)*	**Team 4 Adults** *M(SD)*	**Total average** *M(SD)*
	Athletes	Athletes	Athletes	Athletes	Athletes
Individual Performance	3.90(0.97)	3.52(1.16)	3.73(1.05)	3.49(0.86)	3.67(1.03)
Collective Performance	4.14(0.82)	3.91(0.85)	3.88(0.97)	3.81(0.96)	3.95(0.91)
	Coach	Coach	Coach	Coach	Coaches
Collective Performance	4.20	4.40	4.20	3.80	4.15(0.65)

Discussion

This study tested a new system of communication behaviors codification for the first time. This system was applied in the context of a collective sports with athletes of different ages and our data suggests four main conclusions.

First, the CBES offered promising indications of validity dividing the coaching behaviors by the impact produced in the communication process (positive or negative). However, item 11 of negative vision needs to be reformulated to better capture the intrinsic meaning of this communication behavior. Nevertheless, the system seems to capture the phenomenon (56% of explained variance) and may represent a valid system of analysis for researchers and practitioners interested in studying the impact produced by the communication ability of coaches on psychological wellbeing and performance of athletes. This may reflect an advance in the coaching literature because most of the actual communication coding systems still misses information about their psychometric properties.

Second, positive behaviors assumed by coaches were more prevalent than negative behaviors, which is in accordance with athletes' and coaches' perceptions, as well as with observation results. This reinforces a favorable pattern of communication between coaches and athletes for all teams included in our study. Quite interesting is the fact that athletes perceived spontaneous and reactive behaviors to have similar prevalence, meaning that coaches either use behaviors in a spontaneous form (by their choice) or in a reactive form (responding to previous actions of athletes). However, coaches seem to have a more negative opinion about their own behaviors, by perceiving themselves as displaying more negative reactive than negative spontaneous behaviors which is supported by the observation. In sum, coaches seem to be more prone to negative behaviors when athletes do not act according to their expectations in competition.

Third, the analysis of each behavior pointed out positive feedback and encouragement after failure as the more frequent behaviors assumed by coaches and keeping control as the least frequent positive behavior. Data from the observation confirms that, indeed, positive feedback was one of coaches' more frequent communication behaviors. However, it should be noted that positive vision, encouragement,

positive instruction, comprehension, and comprehension after failure are also highly reported communication behaviors from the perspective of athletes and coaches. There is substantial evidence on literature that coaches concentrate their behaviors on instruction and positive feedback (e.g., Calpe, Guzmán, & Grijalbo, 2013; Potrac et al., 2007; Tharp & Gallimore, 1976; Soriano, Ramis, Cruz, & Sousa, 2014). Our results extend these findings by providing insights about other important behaviors assumed by coaches, as is the case of positive vision and comprehension. For negative behaviors, both athletes and coaches agreed that negative feedback was the most frequent behavior, but coaches thought that they assumed this behavior more often than athletes did. Coaches perceptions were supported by the observation, as over 7% of coaches' communication behavior referred to negative feedback. This result reinforces that there are open opportunities to improve coaches' behaviors, as suggested by the literature on coaching education (Gould, Nalepa, & Mignano, 2020; Mouratidis, Lens, & Vansteenkiste, 2010; Sagar & Jowett, 2012).

Fourth, differences among teams indicate that athletes from Team 1 (U15) perceived encouragement and positive feedback as more frequent than athletes from Team 4 (adults); indifference was also less reported from athletes of Team 1 than athletes of Team 3 (U19). Although without statistical differences, athletes and coach from Team 1 reported higher perceptions of individual and collective performance than athletes and coaches from Teams 3 and 4.

All in all, our data suggests that coaches assumed a positive pattern of communication when interacting with athletes, which seems to slightly decrease as athletes get older. One possible reason for this result may be related to pressure to win in older athletes, which may decrease coaches' tolerance to error. In fact, some research suggests that pressure to win increases along the sport process of athletes' development (Francka & Stambulovaa, 2019; Jenkins, 2018; Mallett & Côté, 2006).

Although our data offers promising results for the communication system divided into positive and negative behaviors versus spontaneous and reactive behaviors, two aspects limit the interpretation of conclusions. First, one negative behavior (negative vision) was not included in the final analysis due to the results from factorial analysis. This means that authors should refine the item in future studies to stabilize the factor structure of the communication system. Second, data from the observation should be collected in future studies by using video technology to allow subsequent data categorization by an experts' panel.

Future research can expand our results by introducing other variables into the analysis, as is the case of the score of the game and the fluctuations of coaching behaviors because there is evidence that coaches change their behaviors according to the score during games (Calpe et al., 2013). Moreover, it would be interesting to analyze differences according to the sex of both coaches and athletes, as there is evidence that suggests communication patters change between man and women (Gearity, 2018; Norman, 2017). Moreover, perceived competence may be also an important factor. Haselwood and colleagues (2005) investigated the relationship between female athletes and head coaches, and the results suggested that effective head coach communication was not based on gender but on perceived communicative competence of the individual. Finally, it may be important to test changes in communication according to the type of sport, namely the ones more interactive and collective and the ones without direct contact between athletes and coaches.

Conclusions

CBES considered coaches' communication behaviors according to two different axes: impact of communication (positive *vs.* negative) and initiative (spontaneous *vs.* reactive), including 16 different behaviors. This evaluation system expands some of the systems current more used by considering transformational and transactional behaviors, as well as a wider range of negative behaviors, allowing for a wider comprehension of interactions that facilitate or debilitate the communication processes. Equally important, this system was applied in a 360º perspective, as data was collected from coaches, athletes and an observer, allowing a better understanding of the phenomenon. The results overall support the idea that this is a useful tool for coaches to improve their communication skills.

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