Psychometric Properties of an Italian Version of the Collective Efficacy Questionnaire for Sports

Abstract

The Collective Efficacy Questionnaire for Sports (CEQS; Short, Sullivan, & Feltz, 2005) is a domain-specific instrument for the assessment of collective efficacy across interdependent team sports. This study evaluated the psychometric properties of an Italian version of the CEQS (CEQS-Ita) with 306 athletes. The instrument showed a good level of internal consistency reliability. Construct validity was demonstrated by examining the factor structure, and convergent and discriminant properties of the instrument. Confirmatory Factor Analyses suggested a model with four sub-dimensions: ability, determination, preparation, and unity. Convergent properties of the instrument were demonstrated through positive correlations with all four components of an Italian version of the Group Environment Questionnaire (GEQ; Andreaggi, Robazza, & Bortoli, 2000). Discriminant validity was evidenced by the absence of correlation with cognitive or somatic anxiety measured through an Italian version of the Revised Competitive State Anxiety Inventory-2 (Martinengo, Bobbio, & Marino, 2012).

Keywords: collective efficacy, measurement translation, construct validity, internal structure, factor structure.

Psychometric Properties of an Italian Version of the Collective Efficacy Questionnaire for Sports

The performance of interdependent sports teams is positively related to the team members' collective efficacy perceptions (Beauchamp, 2007). Over the past two decades studies in sport have adopted two popular definitions of collective efficacy (Myers & Feltz, 2007). The first describes collective efficacy as "a group's shared belief in its conjoint capabilities to organize and execute the courses of action required to produce given levels of attainments" (Bandura, 1997, p. 477). The second refers to collective efficacy as "a sense of collective competence shared among individuals, when allocating, coordinating and integrating their resources in a successful concerted response to specific situational demands" (Zaccaro, Blair, Peterson, & Zazanis, 1995, p. 309). The presence of different definitions for this construct represents a limitation in the existing literature, hindering the development of tools to assess collective efficacy (Maddux, 1999). In order to develop a valid assessment tool, it is necessary to be clear on what constitutes the construct that is intended to be measured (DeVellis, 2003; McKenzie, Podsakoff, & Podsakoff, 2011). As team sports performance is underpinned by the achievement of specific goals (e.g., shots on target in soccer) rather than success in general, we have chosen to adopt Bandura's definition of collective efficacy and follow his subsequent guidelines (Bandura, 2006) for the assessment of collective efficacy beliefs in this study. This decision aligns with the sport-based literature that has explored collective efficacy, enabling cross-comparison of findings with existing and future studies in this setting (see e.g., Bruton, Mellalieu, & Shearer, 2014; Greenlees, Nunn, Graydon, & Maynard, 1999; Shearer, Holmes, & Mellalieu, 2009).

Collective efficacy is rooted in self-efficacy, which refers to an individual's belief in her/his capabilities to perform a specific task (Bandura, 1997). Sources contributing to the development of self-efficacy remain consistent for collective efficacy (mastery experiences,

vicarious experience, verbal persuasion, and physiological/affective states), with the addition of leadership, cohesion and group size specific to collective efficacy (Carron & Hausenblas, 1998). In sport, most of the collective efficacy literature has considered its relationship with team performance (e.g., Heuzé, Raimbault, & Fontaine, 2006; Myers, Feltz, & Short, 2004; Myers, Payment, & Feltz, 2004). A reciprocal relationship has been found between the two, with previous performance impacting collective efficacy levels, which subsequently influence future team performance (Myers, Feltz, et al., 2004). Considerable research has also studied collective efficacy in relation to other group constructs, such as team leadership and team communication (see Zaccaro et al., 1995; Zaccaro, Rittman, & Marks, 2001). Collective efficacy has consistently been shown to positively relate to the task components of group cohesion, a popular group construct in team sports (e.g., Heuzé, Sarrazin, Masiero, Raimbault, & Thomas, 2006; Kozub & McDonnel, 2000), suggesting that confident teams are likely to remain united when seeking to achieve collective performance outcomes.

Research on collective efficacy in sport has included both controlled laboratory-based and ecologically valid field-based studies (e.g., Bray, 2004; Bruton et al., 2014; Dithurbide, Sullivan, & Chow, 2009; Feltz & Lirgg, 1998). Using laboratory-based designs, Bray (2004) showed that group goals mediated the relationship between collective efficacy and performance in a group task, while Bruton and colleagues (2014) demonstrated that team members' perceptions of collective efficacy can be increased using video-based observation interventions with positive group content. Studies adopting a field-based longitudinal design during a competitive season have demonstrated a positive relationship between collective efficacy and team performance for volleyball (Dithurbide et al., 2009), American football (Myers, Feltz et al., 2004), and ice hockey (Feltz & Lirgg, 1998).

A further issue surrounding collective efficacy concerns the level at which the construct has been measured, with studies examining collective efficacy at both an individual (e.g.,

Heuzé, Sarrazin, et al., 2006) and team level (e.g., Gibson, 1999). Bandura (1997) suggests that individual team members' confidence in the team's capabilities should be assessed, and these individual beliefs should be aggregated to the team level. Consequently, studies in sport have operationalized and measured collective efficacy in four ways (cf. Lindsey, Brass, & Thomas, 1995). The first approach (CE-SE, collective efficacy based on self-efficacy responses), aggregates individual responses to self-efficacy items, the second (CE-CEI, collective efficacy based on individual perceptions of collective efficacy) aggregates individual assessments of their confidence in their team, the third (CE-CET, where T stands for team) aggregates individual perceptions of their team's confidence in themselves, and the fourth (CE-GCE, collective efficacy based on group discussion about the team's collective efficacy) uses a group discussion to obtain a single estimate of collective efficacy (Myers & Feltz, 2007). Of these operational methods CE-CEI and CE-CET approaches have received most use in sport literature. For example, Paskevich and colleagues (Paskevich, Brawley, Dorsch, & Widmeyer, 1999) employed the CE-CET approach to measure collective efficacy with volleyball players (item e.g., "our team's confidence that we can spike from the left side of the court is…"), while Magyar, Feltz, and Simpson (2004) used the CE-CEI approach to assess collective efficacy beliefs in rowing teams (item e.g., "how confident are you that your crew can settle into the race?"). Given that collective efficacy is generally measured through individual cognitions, we consider it appropriate to measure this construct at the individual-level using the CE-CET approach as it recognizes the unique characteristics of each team member and does not assume that one global method will work for all team members (cf. Bruton et al., 2014; Bruton, Mellalieu, & Shearer, 2016).

As the study of collective efficacy has increased in sport, multiple methods have been developed to assess this construct. Studies have employed sport-specific collective efficacy questionnaires that measure skills or actions that encapsulate overall performance in team

sports such as rugby union (Kozub & McDonnel, 2000) and ice hockey (Myers, Payment, et al., 2004). Instruments that focus on a team's confidence for particular aspects of sport performance have also been adopted. For example, Myers, Feltz and colleagues (2004) developed a questionnaire that assessed American football player's confidence in their team's capabilities to perform offensive actions in a competitive match. Such bespoke measures allow for in-depth assessment of collective efficacy for a sport, but do not permit comparison of findings between sports due to the sport-specific content included (Short, Sullivan, & Feltz, 2005). For example, with a questionnaire specific to soccer it is possible to investigate the players' belief in their team's ability to succeed in a corner kick set-piece, but this is not possible in sports where this set-piece does not occur, such as in basketball or volleyball. A sport-domain measure of collective efficacy allows for the potential comparison of efficacy for aspects common to different team sports, such as the union of the group or their persistence during performance (cf. Short et al., 2005).

Domain-specific instruments already exist for group-based psychological constructs in sporting contexts. For example, the Group Environment Questionnaire (GEQ; Carron, Widmeyer, & Brawley, 1985) assesses the cohesion of the group towards both task and social aspects. In the sport literature, group cohesion, and in particular the group integration towards the task, is reported to hold a positive relationship with collective efficacy (e.g., Heuzé, Raimbault, et al., 2006; Heuzé, Sarrazin, et al., 2006; Kozub & McDonnel, 2000; Paskevich, et al., 1999; Spink, 1990). Single-item instruments withstanding (e.g., Bruton et al., 2016), the majority of questionnaires for collective efficacy explore multiple dimensions of the construct. The Collective Efficacy Questionnaire for Sports (CEQS; Short et al., 2005) is a multidimensional collective efficacy instrument which has been used across several coactive and interdependent team sports, such as rugby union, hockey, soccer, volleyball, basketball,

water polo, swimming relay, and track and field relay teams, among others (see e.g., Bruton et al., 2016; Dithurbide et al., 2009; Jowett, Shanmugam, & Caccoulis, 2012).

In its development, the CEQS was subject to rigorous psychometric assessment procedures, including item generation, exploration of the factor structure, scale modification, confirmation of the factor structure, and analysis of the correlations with the GEQ for the assessment of construct validity (Short et al., 2005). The final model resulted in a 5-factor first order structure where all the factors were correlated (model fit reported by authors: X^2=574.3(160); $p < .001$; *CFI*=0.92; *NNFI*=0.90; *SRMR*=.04; *RMSEA*=.09 [90% CI=.087-1.04]). The five dimensions of the scale were named: ability, effort, persistence, preparation, unity. In the original study, the subdimensions of the CEQS and the composite score were reported to have weak to moderate positive correlations with all the dimensions of the GEQ (ranging from .20 to .57). Scores for the group integration toward the task (GI-T) dimension showed the highest correlations with the CEQS sub-dimensions (ranging from .37 to .57), with the 'unity' sub-dimension reporting the strongest positive correlation (.57). Since its inception, the CEQS has been adapted for use in other languages, such as Japanese (Hochi, Mizuno, & Nakayama, 2012), Greek (Jowett et al., 2012), Spanish (Martinez, Guillen, & Feltz, 2011), and Turkish (Öncü, Feltz, Lirgg, & Gürbüz, 2018). Despite multiple translations existing for this questionnaire, it has yet to be adapted for use with an Italian-speaking population. Italy has approximately four and a half million athletes registered with sporting federations and practicing sport at different competitive levels (CONI, 2014). This represents a large population of interest for the study of group dynamics within sporting contexts, but at present no domain-specific instrument exists for collective efficacy measurement in Italian sports teams. Therefore, the present study aimed to examine the psychometric properties of an Italian translation of the CEQS (CEQS-Ita) for use with Italian-speaking team sports

athletes, and to provide a cross-cultural validation of an instrument used for measuring collective efficacy in sports.

To achieve this aim, we followed a number of guidelines for scale development and refinement (AERA, APA, & NCME, 2014; DeVellis, 2003; MacKenzie, Podsakoff, & Podsakoff, 2011; Tenenbaum, Eklund, & Kamata, 2012; Zumbo & Chan, 2014). As this study aimed to examine the psychometric properties of an already existing and conceptually grounded scale, our focus was on the confirmation of the factor structure and on the examination of its convergent and discriminant properties. Confirmatory Factor Analysis (CFA), an evaluation method for all new and existing measures in sport and exercise psychology (Marsh, 2007), was used to assess the factor structure of the CEQS-Ita. To explore the convergent properties of the CEQS-Ita, it is necessary to identify if scores for this instrument are positively correlated with measurement scores for a similar construct (Martin, Carron, Eys, & Loughead, 2013; Trochim, 2000). Cohesion and collective efficacy exhibit a positive relationship (e.g., Heuzé, Raimbault et al., 2006), therefore, we examined the correlations between an Italian version of the GEQ (Andreaggi, Robazza, & Bortoli, 2000) and the CEQS-Ita, expecting to find that all four components of the GEQ would correlate positively with sub-dimension and composite scores for the CEQS-Ita. To provide support for the discriminant properties of the CEQS-Ita, it is necessary to identify if scores for this instrument demonstrate a negative or zero correlation with a different construct (Martin et al., 2013; Trochim, 2000). As collective efficacy is proposed to have a negative relationship with cognitive anxiety and no relationship with somatic anxiety (Greenlees et al., 1999), we explored the correlations between the CEQS-Ita and an Italian version of the Revised Competitive State Anxiety Inventory-2 (Martinengo, Bobbio, & Marino, 2012). We hypothesized that the cognitive anxiety and somatic anxiety subscale scores would be negatively correlated and uncorrelated with CEQS-Ita scores, respectively.

Method

Participants

Three hundred and six athletes (*n* = 205 male, *n* = 101 female) with a mean age of 27.29 years (*SD* = 7.15) ranging between 18 and 56 were recruited for participation in this study. Participants were sampled from 29 Italian sport teams and included players from: baseball and softball (*n* = 68), basketball (*n* = 56), volleyball (*n* = 52), football (*n* = 32), rugby (*n* = 30), handball (*n* = 27), water polo (*n* = 23), field hockey (*n* = 18). Athletes ranged in ability from recreational to semi-professional and professional competitive levels. Participants had an average of 12.03 years of experience in their own sport (*SD* = 7.81; range: 1-45 years), and 6.23 years' experience in their current team (*SD* = 5.46; range: 1-21 years). With regards to the sample size, we adopted MacKenzie and colleagues' guidelines, which suggest a minimum of 100-500 participants for scale validation studies, and a minimum ratio between the number of respondents and the number of items of at least 3:1 (MacKenzie et al., 2011). In the present study, the eventual ratio was 15:1 (306 respondents for 20 items).

Measures

Collective efficacy. Collective efficacy was measured through a translated version of the CEQS (Short et al., 2005). The CEQS is a 20-item questionnaire consisting of five factors: ability, effort, persistence, preparation, and unity. Ratings are made on a 10-point likert scale ranging between 0 (not at all confident) and 9 (completely confident). Items from the original (CEQS) and the Italian version (CEQS-Ita) are presented in Table 1. In line with the development of the original scale (see Short et al., 2005), items were introduced by the stem: "Rate your team's confidence, in terms of the upcoming competition, that your team has the ability to…" (translated as "*In riferimento alla prossima competizione, valuta la fiducia della tua squadra riguardo al fatto che la squadra abbia la capacità di…*"). This

adopts a CE-CET approach to collective efficacy measurement whereby individuals are asked to rate the team's confidence in themselves (see Lindsey et al., 1995).

Group cohesion. The Italian version of the Group Environment Questionnaire (GEQ; Andreaggi et al., 2000) was utilized for the measurement of group cohesion. The GEQ consists of 18 items and is made up of four components: individual attraction towards group's social activities (ATG-S, 5 items); individual attraction towards group task (ATG-T, 4 items); group integration on social aspects (GI-S, 4 items), group integration towards the task (GI-T, 5 items). Responses are made on a 9-point likert scale ranging between 1 (strongly disagree) and 9 (strongly agree). Andreaggi et al.'s study reported mixed findings for the internal reliability for each of the GEQ factors (α *range* = .59-.77), with acceptable to good alpha values evident for the present study: ATG-S (α = .70), ATG-T (α = .61), GI-S (α = .71), GI-T (α = .68).

Precompetitive anxiety. In order to evaluate athletes' cognitive and somatic anxiety, we utilized two sub-scales from the Italian version of the Competitive State Anxiety Inventory-2 revised (CSAI-2 revised; Martinengo et al., 2012). The sub-scales were composed of 7 items for somatic anxiety and 5 items for cognitive anxiety. Responses were provided on a 4-point likert scale ranging from 1 ("not at all") to 4 ("very much"). Good Cronbach's alpha values for both subscales were found in the original study (α *range* = .78-.84) as well as in the present investigation (α *range* = .81-.82).

Procedure

An initial translation of the CEQS into Italian language was made by the first and the fourth authors of this study, both native Italian speakers competent in English and Italian languages. The questionnaire translation was checked by the first (native Italian speaker) and second author (native English speaker) through a collaborative and iterative method (cf.

Douglas & Craig, 2007). This method mantains conceptual equivalence, overcoming the biases of literal translation, a common pitfall associated with the back-translation method (Douglas & Craig; Van de Vjier & Hambleton, 1996). For example, in the Spanish version of the CEQS (Martinez et al., 2011), back-translation led to the mistranslation of an item. Specifically, "Stay in contention when it seems like your team isn't getting any breaks" became "*Permanecer en el juego cuando parece que tu equipo no tiene descanso alguno*", which is more similar to "Stay in contention when it seems like your team isn't getting any rest", whereas the expression "getting a break" in English language does not literally mean "getting a rest", but it is more related to a component of luck. The use of the collaborative and iterative method allowed us to translate this item as "*Rimanere in gara anche quando sembra che la propria squadra non abbia buone opportunità*", which is similar to "Stay in contention when it seems like your team isn't getting any good opportunities", maintaining conceptual equivalence.

Once translated, the CEQS-Ita was placed into a questionnaire pack along with a demographic sheet and the Italian versions of the GEQ and somatic/cognitive anxiety subscales from the CSAI-2 revised. An online version of the questionnaire pack was then created using an online-survey provider (Qualtrics) and the administration procedure was entirely online. Prior to recruitment, ethical permission to conduct the study was obtained from the institution ethics committee of the first author. A preliminary study, using 10 athletes, confirmed the clarity of the instructions and item-wording for the CEQS-Ita. An opportunity sampling method was used to recruit a large sample of athletes via email in order to provide an accurate representation of the Italian team sports population. The senior official at the club (i.e., coach, manager, president) was contacted directly, by phone or in person, provided with information on the study and asked to administer the online survey link to all members of their

team. Prior to completion of the online survey, study participants were informed that their involvement was voluntary, there was no correct/incorrect answer to the questions presented, and that answers would remain strictly confidential and securely stored on computers within the university department of the research team. The online questionnaire pack took approximately fifteen minutes to complete.

Data Analysis

In order to prepare data for analysis, a listwise deletion approach was adopted. No data transformation was performed on the data sample. Further data screening and Cronbach's alpha analyses were performed using IBM SPSS 20.0. In line with recent standards for test development (see AERA, APA, & NCME, 2014; Tenenbaum et al., 2012; Zumbo & Chan, 2014), construct validity of the CEQS-Ita was explored through the investigation of the internal factor structure of the questionnaire in combination with convergent and discriminant evidence. Data was transferred onto IBM AMOS Graphic 20.0 and three Confirmatory Factor Analyses (CFAs) with maximum likelihood estimation were conducted to examine the factor structure of CEQS-Ita. CFA is a form of Structural Equation Modelling (SEM) that provides a fit for the whole model. In order to deem the model fit acceptable, the following statistics must be achieved: A ratio lower than 5 between Chi-square and degrees of freedom (Byrne, 2010); Comparative Fit Index (CFI), Non-normed Fit Index (NNFI) and Incremental Fit Index (IFI) values equal to or greater than 0.90 (Bentler & Bonnett, 1980; Byrne); and a Root Mean Square Error of Approximation (RMSEA) value lower than .10 (Byrne, 2010). Additionally, an excellent model fit would be indicated by CFI, NNFI and IFI values equal to or greater than 0.95 (Hu & Bentler, 1999), an RMSEA value lower than .05, and upper- and lower-bound confidence interval (CI) values being tightly grouped around the RMSEA (MacCallum, Browne, & Sugawara, 1996). Finally, the lower

the Aikake Information Criteria (AIC) the better the model fits (Jackson, Gillaspy, & Purc-Stephenson, 2009).

Once the optimal model fit was decided upon, Pearson's correlations were computed between the CEQS-Ita (composite and factor scores) and components of the Italian versions of the GEQ, and subscales of the CSAI-2 revised. This provided information with regards to convergent and discriminant properties of the instrument. Strength of the Pearson's correlation values were described according to Evans' (1996) guidelines: .00-.19 "very week", .20-.39 "weak", .40-.59 "moderate", .60-.79 "strong", and .80-1.00 "very strong".

Results

Data Screening and Reliability

Descriptive statistics with means, standard deviations and kurtosis for each item were analyzed (See Table 1). All items presented a Kurtosis value between -0.11 and 1.62, indicating a normal distribution of data (Byrne, 2010) and allowing for further parametric analyses. Good to excellent Cronbach's alpha scores were reported for the overall scale (α = .95) and each of the subscales (ability, α =.90; effort, α =.81; persistence, α =.81; preparation, α =.84; and unity, α =.88), suggesting strong internal consistency reliability.

Construct Validity

Internal structure. A first CFA was performed in order to confirm the factor structure proposed by Short and colleagues (2005). The original 5-factor lower order model, with the sub-dimensions of ability, effort, persistence, preparation, and unity, was tested demonstrating an acceptable fit (Model fit: X^2=462.8(158); $p < .001$; *CFI*=0.93; *NNFI*=0.91; *IFI*=0.93; *RMSEA*=.080 [90% CI=.071-.088]; *AIC* = 619.18). However, a multicollinearity problem emerged between the sub-dimensions of effort and persistence. For this reason, a second model was attempted with these two sub-dimensions merged in a unique eight-item sub-dimension named 'determination'. In this second CFA, the 4-factor lower order model

showed a stronger fit (Model fit: X^2=448.4(161); $p < .001$; *CFI*=0.93; *NNFI*=0.92; *IFI*=0.93; *RMSEA*=.076 [90% CI=.068-.085]; *AIC* = 586.88) and did not evidence any multicollinearity problem (Table 2). All items had significant factor loadings and all the sub-dimensions showed positive correlations (Figure 1). In order to assess the existence of a higher order general collective efficacy factor, a third CFA was conducted to evaluate a 4-factor higher order model, with the four factors considered as sub-dimensions of the construct of collective efficacy. CFA for this model revealed an acceptable fit (Model fit: X^2=457.3(163); $p < .001$; *CFI*=0.93; *NNFI*=0.92; *IFI*=0.93; *RMSEA*=.077 [90% CI=.069-.085]; *AIC* = 591.66). Factor loadings for all items were significant and all the four sub-dimensions regressed significantly on the collective efficacy construct (Figure 2). Finally, we tested the reliability of the new 8-item determination subscale, which showed a Cronbach's alpha coefficient of .89, a higher score than the two subscales when considered independently. A comparison between the three considered models and the original model proposed by Short and colleagues is reported in Table 2.

Convergent evidence. Once the CEQS-Ita structure was evaluated, a Pearson's correlation test was undertaken to examine the relationship of the questionnaire with the other two measurement instruments (Table 3). Moderate to strong positive correlations were found between the composite score of the CEQS-Ita and the four components of the GEQ: ATG-S (.33, p < .01), ATG-T (.41, p < .01), GI-S (.39, p < .01), GI-T (.66, p < .01). Sub-dimensions of the CEQS were also positively correlated with the components of the GEQ. Ability demonstrated weak to moderate positive correlations ranging from .22 to .42 (ATG-S: .22, p < .01; ATG-T .33, p < .01; GI-S: .29, p < .01; GI-T: .42, p < .01). Determination correlations were weak to strong, ranging from .32 to .64 (ATG-S: .32, p < .01; ATG-T: .39, p < .01; GI-S: .39, p < .01; GI-T: .64, p < .01). Preparation correlations were weak to strong, ranging from .29 to .60 (ATG-S: .29, p < .01; ATG-T: .37, p < .01; GI-S: .34, p < .01; GI-T: .60, p <

.01). Unity showed weak to strong positive correlations, ranging from .32 to .66 (ATG-S: .32, $p < .01$; ATG-T: .37, $p < .01$; GI-S: .36, $p < .01$; GI-T: .66, $p < .01$).

Discriminant evidence. No correlations were reported between the composite score of the CEQS-Ita and the cognitive (-.10, $p = .10$) and somatic anxiety subscales of the CSAI-2 revised (-.07, $p = .22$). Ability was not correlated with cognitive anxiety (-.10, $p = .09$) and somatic anxiety (-.05, $p = .40$). Determination was not correlated with cognitive anxiety (-.08, $p = .16$) and somatic anxiety (-.06, $p = .27$). Preparation was not correlated with cognitive anxiety (-.04, $p = .44$) and somatic anxiety (-.07, $p = .25$). Unity showed a negative correlation with cognitive anxiety (-.12 $p = .04$) but no correlation with somatic anxiety (-.07, $p = .21$).

Discussion

When combined, the findings from the current study suggest that the Italian version of the CEQS is a reliable and valid instrument for the measurement of collective efficacy in Italian-speaking interdependent team sports athletes. Exploration of the internal structure suggests that a four-dimension model should be adopted for the CEQS-Ita, where effort and persistence are merged in a unique sub-dimension, labelled ‘determination’. In terms of collective efficacy theory, Short et al. (2005) did not provide definitions for the different subdimensions of collective efficacy in sports teams when developing and validating the CEQS. Based on Bandura’s (1997) collective efficacy theory, it is noted that effort refers to a generic, motivational component (i.e., a team with high collective efficacy will produce high levels of effort for a given task), whereas persistence is framed around a state where the likelihood of failure is increased (i.e., a team with high collective efficacy will persist for a long period when under pressure or under-performing). However, when providing guidance for efficacy measurement, Bandura (2006) states that “people with tenacious belief in their capabilities will persevere in their efforts” (2006, p. 314), suggesting effort and persistence may overlap in terms of operationalisation and thus could be considered conceptually similar.

This difference is not currently reflected in the items of the original version of the CEQS. For example, “perform to its capabilities” or “overcome distractions” (two items of the effort subscale) and “perform under pressure” or “perform well without your best players” (two items of the persistence subscale) may lead a statistical overlap between the two subdimensions. To differentiate between effort and persistence, in line with Bandura’s suggestions for scale development (2006), it may be necessary to consider revising items of the original CEQS in order to obtain a dimension of effort more related to effort expenditure, and a dimension of persistence more clearly related to resilience to adversity. .

Both a lower order model, with all the dimensions free to correlate, and a higher order model, where the four sub-dimensions all contribute towards a general construct of collective efficacy, have been found to be valid for the measurement of collective efficacy through the CEQS-Ita. The implication of this finding is twofold: first, the four dimensions of the CEQS-Ita may be utilised as interdependent scores; second, the higher order model supports the use of a composite score representing a general construct of collective-efficacy. Although both these structures partially differ from those of the original CEQS, it should be noted that the 4-factor model of the CEQS-Ita shows a closer fit when compared to the 5-factor model proposed by Short and colleagues (2005). Such differences may be due to linguistic biases apparent when translating a questionnaire across languages (cf. Van de Vijer & Hambleton, 1996). For example, the idiom “work ethic” in the English language is applicable to different contexts but its most literal translation in the Italian language, *“etica del lavoro”* refers to professional contexts. In a bid to overcome this bias and maintain equivalence above word level (see Baker, 2011) the item “Demonstrate a strong work ethic” was translated as *“Dimostrare un forte spirito di sacrificio”* due to the preference for this term in sports contexts. This adaptation and other similar adaptations may have affected the dimensionality of the instrument. It should be noted, however, that multicollinearity issues among sub-

dimensions of the original version of the CEQS have been reported for athletes across various team sports, such as volleyball and basketball (Dithurbide et al., 2009; MacLean & Sullivan, 2003; Sullivan, Short, & Feltz, 2001). In their season long investigation in male basketball, MacLean and Sullivan (2003) found that all the factors of collective efficacy were highly correlated ($p < .001$), with very strong correlations ranging from .951 to .995. The authors stated that, for their sample, collective efficacy appeared to be a unidimensional construct. Similarly, Dithurbide and colleagues (2009) study on volleyball players reported highly significant positive correlations between each of the CEQS factors ($r = .70$ to .92, $p < .01$). They also conducted an Exploratory Factor Analysis (EFA) that produced one single factor. In addition, in the original study developing the CEQS (Short et al., 2005), the dimensions of 'effort' and 'persistence' were very strongly correlated ($r = .86$, $p < .001$) and the authors considered the possibility to merge the sub-dimensions to align with Bandura's (1997) suggestions for efficacy measurements. Consequently, we suggest that future studies utilizing the original version of the CEQS, or its translated versions, evaluate the factor structure for this instrument to determine whether the original 5-factor structure is suitable for use in all instances.

Although Italian translations of measures for other group constructs such as the GEQ have provided low to moderate Cronbach's alpha values (e.g., Andreaggi et al., 2000), high internal consistency reliability was reported for the CEQS-Ita for both the composite collective efficacy score and sub-dimension scores (ability, determination, preparation, unity). The construct validity of the CEQS-Ita was also supported through evidence of its convergent and discriminant properties. Specifically, the convergent evidence for the measure was supported by positive correlations with all four components of the GEQ. Larger positive correlations emerged between composite CEQS-Ita scores and task-related components of the GEQ when compared to social-related components, with GI-T found to have the largest

positive correlation with composite scores for the CEQS-Ita. The sub-dimensions of the CEQS-Ita, unity and determination reported the largest positive correlations with the GEQ components, whereas ability indicated the weakest positive correlations. It is also worthy of note that the GI-T dimension of the GEQ and the unity dimension of the CEQS showed a strong positive correlation (.66) and this may indicate a conceptual overlap between the two constructs and potential multicollinearity issues when investigating cohesion and collective efficacy using multivariate statistical analyses methods. Therefore, future studies should proceed with caution when utilising these measurement instruments together, or, alternatively, seek to use the CEQS excluding the unity subdimension (see e.g., Filho, Tenenbaum, & Yang, 2015). The discriminant evidence for the CEQS-Ita was also supported through the absence of correlations between the composite score of the CEQS-Ita and cognitive/somatic anxiety subscale scores for the Italian version of the CSAI-2 revised. The same evidence emerged for the sub-dimension scores for the CEQS-Ita, the exception being the negative correlation between the unity sub-dimension and the cognitive anxiety subscale. Greenlees et al. (1999) also found a negative relationship between collective efficacy and cognitive anxiety in sport, and therefore our finding potentially provides further discriminant evidence for the construct validity of the measure.

On a more applied perspective, this validation of the CEQS-Ita allows for the assessment of collective efficacy among Italian speaking sports teams for the first time. For researchers and practitioners operating in Italian contexts, it is now possible to assess the team's perceived efficacy in a valid manner at relevant intervals across a season. For example, a coach or sport psychologist could use the CEQ-Ita to measure changes in collective efficacy pre- and post-match to better understand immediate responses to competition, monitor collective efficacy across different periods within a competitive season (e.g., pre-season, early-season, mid-season, late-season) to gauge a team's development, or

use the questionnaire to assess a teams' responses to psychological interventions targeting increased efficacy beliefs in sports teams (e.g., Bruton, Shearer, & Mellalieu, 2019). Additionally, practitioners operating within multicultural sport teams now have an instrument which can be used in six different languages: English (Short et al., 2005), Spanish (Martinez et al., 2011), Japanese (Hochi et al., 2012), Greek (Jowett et al., 2012), Turkish (Öncü et al., 2018), and Italian, allowing the accurate assessment of collective efficacy beliefs in sports teams composed of players from various countries and speaking various languages.

Despite the current study providing support for the utilization of the CEQS-Ita, some limitations should be considered. First, we did not to run power analysis calculations, relying on guidelines for sample size estimates (i.e., MacKenzie et al., 2011) and looking at confidence intervals, which were adequately narrow in our study. This decision is partially supported in measurement literature (see, e.g., Hoenig & Heisey, 2001; Levine & Ensom, 2001), but studies have suggested that power analysis is important for factor structure assessment because the model fit in a SEM analysis may be affected by the sample size (see, e.g., Cohen , 1988; MacCallum, et al., 1996). Therefore, it is recommended that future studies run power analyses procedures to calculate the sample size when further assessing the factor structure of this measure to control for the dimensionality of the CEQS (Cohen, 1988; MacCallum, et al., 1996). Furthermore, support for the internal reliability of this instrument was provided by strong Cronbach's alpha values for both the composite and sub-dimension scores, but the reliability of this measure over time was not assessed. Future research should aim to extend our study by using a longitudinal repeated measures design (cf. Myers, Feltz, et al., 2004). This methodology will: (a) allow examination of the test-retest reliability of the measure when collective efficacy is predicted to remain the same (e.g., off-season period); and (b) permit investigation of the predictive validity of this measure by assessing the collective efficacy-performance relationship across a competitive season. A reciprocal

relationship is said to exist between collective efficacy and team performance whereby past results predict efficacy beliefs, which in turn predict subsequent performance levels (cf. Beauchamp, 2007). In the present study it was not feasible to compare the performance results of teams across different sports and competitive levels. Similarly, the original development of the CEQS did not assess the predictive capabilities of the instrument (Short et al., 2005), but studies have since provided predictive evidence to further support its validity (e.g., Dithurbide et al., 2009). Predictive evidence for the CEQS-Ita can be demonstrated using longitudinal studies that consider variations in collective efficacy as a function of performance and vice versa. Alternatively, experimental studies can adopt the CEQS-Ita and document its capability to capture changes in perceptions of collective efficacy following psychological interventions, another form of predictive validity (see Bruton et al., 2016, for an example).

In a bid to comprehensively assess the psychometric properties of the CEQS-Ita, research should focus on the relationship between collective efficacy measured using this domain-specific measure and collective efficacy values for sport-specific measures. Sport-specific measures of collective efficacy (e.g., Myers, Payment, et al., 2004) tap into the competencies associated with effective team performance in each sport and thus meet Bandura's (2006) recommendations that efficacy scales consider general and specific components that make-up optimal functioning for a specific task. However, such scales do not permit accurate comparisons across sports and may lead to conceptual variability when measuring collective efficacy beliefs in sport (Short et al., 2005). Comparing the CEQS-Ita against such measures will provide further confirmation of the scale as a suitable method for the assessment of collective efficacy across different team sports. Additionally, further exploration of the relationship between scores for the CEQS-Ita and other group-related constructs is warranted. This includes group dynamics variables that vary in terms of

convergence with collective efficacy as a concept, such as leadership, intra-team communication and group member satisfaction, to further explore the convergent validity of the measure. With regards the examination of the discriminant properties of the CEQS-Ita, we note that the CEQS-Ita and the Revised CSAI-2 are based on an individual's perceptions of psychological constructs. However, it should be noted that the CEQS-Ita measures perceptions of a group-level construct (i.e., collective efficacy), whereas the Revised CSAI-2 measures perceptions of an individual-level construct (i.e. competitive anxiety). Although previous studies (e.g. Greenlees et al., 1999) have already compared these two constructs and provide a precedent for this comparison, future studies should further consider discriminant properties of the CEQS-Ita through comparison with other group processes measures (e.g. team members' satisfaction) and through other methods (e.g. multitrait-multimethod model analyses, MTMM – see Byrne, 2010).

With specific reference to sport, invariance tests for age, gender, amount of experience, level of competition, type of sport, and level of sport are required to further validate the measure for use in this context (cf. Short et al., 2005). A specific limitation of the present study was the inability to compare results for skill level (i.e., elite/non-elite athletes) due to the disparity in the number of participants. Although it is important to understand the validity of the CEQS-Ita for use with a heterogeneous sample of team sports athletes, a comparison between athletes of different status will further increase the understanding of the psychometrics for this instrument. Indeed, as differences in perceptions of group dynamic processes have been reported between elite and non-elite performers (see e.g., Heuzé, Raimbault, et al., 2006) we suggest that academics utilize the CEQS-Ita with elite team sports athletes in order to provide further data for a possible meta-analysis exploring this issue. A further limitation of this heterogeneous sample is that it compares sports where the team structures differ. For example, in baseball teammates perform offensive actions in isolation

(batting) but work together when defending (fielding). In contrast, in soccer or basketball, the teams must always work in unison to achieve their goals, but certain players will adopt offensive roles whilst others will be defenders. As asserted by Bandura (1997), collective efficacy is more predictive of team performance when the group task is highly interdependent. Therefore, future research should seek to explore the invariance of the CEQS-Ita in team sports with different team structures (e.g., coactive teams, interactive teams with low interdependence, and interactive teams with high interdependence).

The CEQS-Ita contributes to the literature on collective efficacy in sport with a further exploration of the construct dimensionality and provides an additional instrument for the assessment of collective efficacy across different cultural contexts. Together with existing translated-versions of the CEQS in other languages, the CEQS-Ita allows researchers and practitioners to assess collective efficacy within multicultural sports teams. Future studies should aim to adapt the questionnaire for use in other languages in order to extend its applicability. It is important to note, in fact, that the adoption of a common instrument for the measurement of collective efficacy allows researchers to overcome existing inconsistencies in the exploration of the construct in sport. The present study is the first to explore and support the reliability and validity of the CEQS-Ita for use with Italian-speaking team sports athletes. Future research should be undertaken in Italian contexts to extend the validity of this instrument and, in particular, to consider: (a) the stability of the scale structure over time (i.e., with longitudinal study designs); (b) the relationship between collective efficacy and performance; (c) the variability of the scale structure across different team sports (e.g., baseball vs soccer) and skill level (e.g., recreational vs professional levels); (d) the relationship between the CEQS-Ita and other sport-specific measures of collective efficacy existing in the Italian language (e.g., the Basket Efficacy Beliefs Scale – BEBS; Steca,

Militello, & Gamba, 2010); and (e) the relationships between the CEQS-Ita and other group-related concepts.

References

American Educational Research Association, American Psychological Association, & National Council on Measurement in Education. (2014). *Standards for educational and psychological testing.* Washington, DC: American Psychological Association.

Andreaggi, G., Robazza, C., & Bortoli, L. (2000). Coesione sociale e sul compito negli sport di squadra: Il Group Environment Questionnaire. [Social and task cohesion in team sports: The Group Environment Questionnaire] *Giornale Italiano di Psicologia dello Sport, 2,* 19-23.

Baker, M. (2011). *In other words: A coursebook on translation.* New York: Routledge.

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York: W. H. Freeman and Company.

Bandura, A. (2006). Guide for constructing self-efficacy scales. In F. Pajares & T. Urdan (Eds.). *Self-efficacy beliefs of adolescents,* (pp. 307-337). Greenwich, CT: Information Age Publishing.

Beauchamp, M. R. (2007). Efficacy beliefs within relational and group contexts in sport. In S. Jowett & D. Lavallee (Eds.), *Social psychology in sport* (pp. 181-193). Leeds, UK: Human Kinetics.

Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin, 88*(3), 588.

Bray, S. R. (2004). Collective efficacy, group goals, and group performance of a muscular endurance task. *Small Group Research, 35,* 230-238. doi:10.1177/1046496403260531

Bruton, A. M., Mellalieu, S. D., & Shearer, D. A. (2014). Observation interventions as a means to manipulate collective efficacy in groups. *Journal of Sport and Exercise Psychology, 36,* 27-39. doi:10.1123/jsep.2013-0058

Bruton, A. M., Mellalieu, S. D., & Shearer, D. A. (2016). Validation of a single-item stem for collective efficacy measurement in sports teams. *International Journal of Sport and Exercise Psychology, 14*, 383-401. doi:10.1080/1612197X.2015.1054853

Bruton, A. M., Shearer, D. A., & Mellalieu, S. D. (2019). Who said "there is no 'I' in team"? The effects of observational learning content level on efficacy beliefs in groups. *Psychology of Sport and Exercise*, 101563

Byrne, B. M. (2010). *Structural equation modeling with AMOS. (2nd ed.).* New York: Routledge.

Carron, A. V. (1982). Cohesiveness in sport groups: Interpretations and considerations. *Journal of Sport Psychology, 4*, 123-138.

Carron, A. V., Colman, M. M., & Wheeler, J. (2002). Cohesion and performance in sport: A meta-analysis. *Journal of Sport and Exercise Psychology, 24*, 168-188.

Carron, A. V., & Hausenblas, H. A. (1998). *Group dynamics in sport.* Morgantown, WV: Fitness Information Technology.

Carron, A. V., Widmeyer, W. N., & Brawley, L. R. (1985). The development of an instrument to assess cohesion in sport teams: The Group Environment Questionnaire. *Journal of Sport Psychology, 7*, 244-266.

CONI (2014). Lo Sport in Italia: Numeri e Contesto. [Sport in Italy: Numbers and Context] http://www.coni.it/images/numeri_dello_sport/Lo_Sport_in_Italia.pdf

Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences.* US: Lawrence Erlbaum associates.

DeVellis, R. F. (2003). *Scale development. Theory and applications (2nd ed.).* London: SAGE Publications.

Dithurbide, L., Sullivan, P., & Chow, G. (2009). Examining the influence of team-referent causal attributions and performance on collective efficacy: a multilevel analysis. *Small Group Research, 40*(5), 491-507.

Douglas, S. P., & Craig, C. S. (2007). Collaborative and iterative translation: An alternative approach to back translation. *Journal of International Marketing, 15,* 30-43.

Evans, J. D. (1996). *Straightforward statistics for the behavioral sciences.* Pacific Grove, CA: Brooks/Cole Publishing.

Feltz, D. L., & Lirgg, C. D. (1998). Perceived team and player efficacy in hockey. *Journal of Applied Psychology, 83,* 557-564.

Filho, E., Tenenbaum, G., & Yang, Y. (2015). Cohesion, team mental models, and collective efficacy: Towards an integrated framework of team dynamics in sport. *Journal of Sports Sciences, 33,* 641-653.

Gibson, C. B. (1999). Do they do what they believe they can? Group efficacy and group effectiveness across tasks and cultures. *Academy of Management Journal, 42,* 138-152. doi:10.2307/257089

Greenlees, I. A., Nunn, R. L., Graydon, J. K., & Maynard, I. W. (1999). The relationship between collective efficacy and precompetitive affect in rugby players: Testing Bandura's model of collective efficacy. *Perceptual and Motor Skills, 89,* 431–440. doi:10.1080/026404199366253

Heuzé, J. P., Raimbault, N., & Fontayne, P. (2006). Relationships between cohesion, collective efficacy and performance in professional basketball teams: An examination of mediating effects. *Journal of Sport Sciences, 24*(1), 59-68.

Heuzé, J. P., Sarrazin, P., Masiero, M., Raimbault, N., & Thomas, J. P. (2006). The relationships of perceived motivational climate cohesion and collective efficacy in

elite female teams. *Journal of Applied Sport Psychology, 18,* 201-218. doi:10.1080/10413200600830273

Hochi, Y., Mizuno, M., & Nakayama, T. (2012). Relationship between collective efficacy and contextual performance among university athletes in Japan. *Work, 41,* 5759-5761.

Hoenig, J. M., & Heisey, D. M. (2001). The abuse of power: The pervasive fallacy of power calculations for data analysis. *The American Statistician, 55,* 19-24.

Hu, L. t., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1-55.

Jackson, D. L., Gillaspy Jr, A. J., & Purc-Stephenson, R. (2009). Reporting practices in Confirmatory Factor Analysis: An overview and some recommendations. *Psychological Methods, 14,* 6-23.

Jowett, S., Shanmugam, V., & Caccoulis, S. (2012). Collective efficacy as a mediator of the association between interpersonal relationships and athlete satisfaction in team sports. *International Journal of Sport and Exercise Psychology, 10*(1), 66-78.

Kozub, S. A., & McDonnell, J. F. (2000). Exploring the relationship between cohesion and collective efficacy in rugby teams. *Journal of Sport Behavior, 23,* 120–129.

Levine, M., & Ensom, M. H. H. (2001). Post Hoc Power Analysis: An idea whose time has passed? *Pharmacotherapy, 21,* 405-409.

Lindsey, D. H., Brass, D. J., & Thomas, J. B. (1995). Efficacy-performance spirals: A multilevel perspective. *Academy of Management Review, 20,* 645-678

MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods, 1,* 130-149.

MacLean, D., & Sullivan, P. (2003). A season long case study investigation of collective efficacy in male intercollegiate basketball. *Athletic Insight, The Online Journal of Sport Psychology, 5*(3), 1-9.

MacKenzie, S. B., Podsakoff, P. M., & Podsakoff, N. P. (2011). Construct measurement and validation procedures in MIS and behavioural research: Integrating new and existing techniques. *MIS Quarterly, 35*, 293-334.

Maddux, J. E. (1999). The collective construction of collective efficacy: Comment on Paskevich, Brawley, Dorsch, and Widmeyer (1999). *Group Dynamics: Theory, Research, and Practice, 3,* 223-226.

Magyar, T. M., Feltz, D. L., & Simpson, I. P. (2004). Individual and crew level determinants of collective efficacy in rowing. *Journal of Sport and Exercise Psychology, 26,* 136-153.

Marsh, H. W. (2007). Application of confirmatory factor analysis and structural equation modeling in sport and exercise psychology. In G. Tenenbaum & R. C. Eklund (Eds.), *Handbook of sport psychology (3rd ed.,* pp. 774-798). Hoboken, NJ: Wiley & Sons Inc.

Martin, L. J., Carron, A. V., Eys, M. A., & Loughead, T. (2013). Validation of the Child Sport Cohesion Questionnaire. *Measurement in Physical Education and Exercise Science, 17*, 105-119. doi:10.1080/1091367X.2013.761023

Martinengo, L., Bobbio, A., & Marino, E. (2012). Psychometric properties of the Italian version of the Revised Competitive State Anxiety Inventory-2. *Bollettino di Psicologia Applicata, 263,* 53-59.

Martinez, J. R., Guillen, F., & Feltz, D. (2011). Psychometric properties of the Spanish version of the Collective Efficacy Questionnaire for Sports. *Psychotema, 23*(3), 503-509.

Myers, N. D., & Feltz, D. L. (2007). From self-efficacy to collective efficacy in sport: Transitional methodological issues. In G. Tenenbaum & R. C. Eklund (Eds.), *Handbook of sport psychology (3rd ed.*, pp. 799-819). Hoboken, NJ: Wiley & Sons Inc.

Myers, N. D., Feltz, D. L., & Short, S. E. (2004). Collective efficacy and team performance: A longitudinal study of collegiate football teams. *Group Dynamics: Theory, Research, and Practice, 8,* 126-138. doi:10.1037/1089-2699.8.2.126

Myers, N. D., Payment, C. A., & Feltz, D. L. (2004). Reciprocal relationships between collective efficacy and team performance in women's ice hockey. *Group Dynamics: Theory, Research, and Practice, 8,* 182-195. doi:10.1037/1089-2699.8.3.182

Öncü, E., Feltz, D. L., Lirgg, C. D., & Gürbüz, B. (2018). The examination of the psychometric properties of the Turkish Collective Efficacy Questionnaire for Sports. *Acta Gymnica, 48,* 27-35.

Paskevich, D. M., Brawley, L. R., Dorsch, K. D., & Widmeyer, W. N. (1999). Relationship between collective efficacy and team cohesion: Conceptual and measurement issues. *Group Dynamics: Theory, Research, and Practice, 3,* 210-222.

Shearer, D. A., Holmes, P., & Mellalieu, S. D. (2009). Collective efficacy in sport: The future from a social neuroscience perspective. *International Review of Sport and Exercise Psychology, 2,* 38-53. doi:10.1080/17509840802695816

Short, S. E., Sullivan, P., & Feltz, D .L. (2005). Development and preliminary validation of the collective efficacy questionnaire for sports. *Measurement in Physical Education and Exercise Science, 9*(3), 181-202. doi:10.1207/s15327841mpee0903_3

Spink, K. S. (1990). Group cohesion and collective efficacy of volleyball teams. *Journal of Sport and Exercise Psychology, 13,* 301-311.

Steca, P., Militello, J., & Gamba, A. (2010). *BEBS – Basket efficacy beliefs scales. Manuale.* Firenze: Giunti O.S..

Sullivan, P. J., Short, S. E., & Feltz, D. L. (2001). A confirmatory factor analysis of the collective efficacy questionnaire for sport. *Paper presented at the Canadian Society of Psychomotor Learning and Sports Psychology (SCAPPS), Montreal, Quebec.*

Tenembaum, G., Eklund, R. C., & Kamata, A. (2012). *Measurement in sport and exercise psychology*. Leeds: Human Kinetics.

Trochim, W. (2000). *The research methods knowledge base, 2nd Edition.* Cincinnati, OH: Atomic Dog Publishing.

Van de Vijer, F., & Hambleton, R. K., (1996). Translating tests: Some practical guidelines. *European Psychologist, 1*, 89-99.

Zaccaro, S., Blair, V., Peterson, C., & Zazanis, M. (1995). Collective efficacy. In J. E. Maddux (Ed.), *Self-efficacy, adaptation, and adjustment: Theory, research, and application* (pp. 305-328). New York: Plenum Press.

Zaccaro, S. J., Rittman, A. L., & Marks, M. A. (2001). Team leadership. *The Leadership Quarterly, 12*, 451-483.

Zumbo, B. D., & Chan, E. K. H. (2014). *Validity and validation in social, behavioral, and health sciences.* New York: Springer.

Tables and Figures

Table 1. *Items of the original and the Italian versions of the CEQS with means, standard deviations, and kurtosis*.

Table 2**.** *Comparison between the three models considered for the CEQS-Ita and the original model of the CEQS.*

Table 3. *Correlations between the CEQS-Ita, the GEQ, and the cognitive and somatic anxiety scales of the CSAI2-r.*

Figure 1. CEQS 4-factor lower order. Standardized estimates. Model fit: X^2=448.9(161); $p < .001$; *CFI*=0.93; *NNFI*=0.92; *IFI*=0.93; *RMSEA*=.077 [90% CI=.068-.085]; *AIC* = 586.88.

Figure 2. CEQS 4-factor higher order. Standardized estimates. Model fit: X^2=457.7(163); $p < .001$; *CFI*=0.93; *NNFI*=0.92; *IFI*=0.93; *RMSEA*=.077 [90% CI=.069-.085]; *AIC* = 591.66.

Table 1. *Items of the original and the Italian versions of the CEQS with means, standard deviations, and kurtosis.*

Collective Efficacy Questionnaire for Sports				
Original items	**Italian items**	**mean**	**SD**	**K**
Ability	*Ability*			
1. Outperform the opposition	1. Avere una prestazione migliore dell'avversario	7.09	1.90	0.48
5. Show more ability than other teams	5. Mostrare maggiori capacità rispetto alle altre squadre	7.51	1.66	0.54
14. Perform more skilfully than the opponent	14. Esprimere una migliore qualità tecnica rispetto all'avversario	7.51	1.62	0.44
15. Perform better than the opposing team(s)	15. Fornire una prestazione migliore rispetto alle squadre avversarie	7.56	1.59	0.27
Effort	*Determination*			
8. Demonstrate a strong work ethic	8. Dimostrare un forte spirito di sacrificio	7.85	1.78	0.45
10. Perform to its capabilities	10. Fornire una prestazione che sia in linea con le proprie potenzialità	7.59	1.55	0.94
16. Show enthusiasm	16. Mostrare entusiasmo	8.20	1.66	1.54
17. Overcome distractions	17. Evitare distrazioni	7.11	1.90	0.27
Persistence				
3. Perform under pressure	3. Fornire una prestazione sotto pressione	7.27	1.72	-0.11
7. Persist when obstacles are present	7. Persistere di fronte agli ostacoli	7.81	1.71	1.07
9. Stay in contention when it seems like your team isn't getting any breaks	9. Rimanere in gara anche quando sembra che la propria squadra non abbia buone opportunità	7.57	1.90	0.80
11. Perform well without your best player	11. Fornire una buona prestazione senza il proprio migliore atleta	7.93	1.72	1.62
Preparation	*Preparation*			
4. Be ready	4. Essere pronti	7.72	1.65	1.21
12. Mentally prepare for this competition	12. Prepararsi mentalmente alla competizione	7.44	1.71	0.20
18. Physically prepare for this competition	18. Prepararsi fisicamente alla competizione	7.77	1.74	1.18
19. Devise a successful strategy	19. Pensare ad una strategia vincente	7.65	1.76	0.57
Unity	*Unity*			
2. Resolve conflicts	2. Risolvere i conflitti	7.52	1.96	0.95
6. Be united	6. Rimanere uniti	8.09	1.95	0.86
13. Keep a positive attitude	13. Mantenere un atteggiamento positivo	7.51	1.85	0.62
20. Maintain effective communication	20. Mantenere una comunicazione efficace	7.57	1.93	0.99

Table 2**.** *Comparison between the three models considered for the CEQS-Ita and the original model of the CEQS.*

	Chi-squared	df	*p*	(X^2/df)	ΔX^2	Δdf^2	*p*	CFI	NNFI/ TLI	IFI	RMSEA	AIC	notes
CEQS-Ita 5-factor Lower order	**463.3**	**158**	**< .001**	**(2.9)**	**-**	**-**	**-**	**0.93**	**0.91**	**0.93**	**.080** CI=.07-.09	**619.18**	Multicollinearity between the sub-dimensions of 'effort' and 'persistence'
CEQS-Ita 4-factor Lower order	**448.9**	**161**	**< .001**	**(2.8)**	**-14.4**	**3**	**< .001**	**0.93**	**0.92**	**0.93**	**.077** CI=.07-.09	**586.88**	
CEQS-Ita 4-factor Higher order	**457.7**	**163**	**< .001**	**(2.8)**	**8.8**	**2**	**< .05**	**0.93**	**0.92**	**0.93**	**.077** CI=.07-.09	**591.66**	
Original CEQS 5-factor*	**574.3**	**160**	**< .001**	**(3.6)**	**-**	**-**	**-**	**.92**	**.90**	**-**	**.09** CI=.08-.10	**-**	*data reported from Short and colleagues (2005)

Table 3**.** *Correlations between the CEQS-Ita, the GEQ, and the cognitive and somatic anxiety scales of the CSAI2-r.*

	CEQS					GEQ				CSAI-2r	
	Ability	Determination	Preparation	Unity	total score	ATG-S	ATG-T	GI-S	GI-T	Somatic anxiety	Cognitive anxiety
CEQS											
Ability	(.90)										
Determination	,673**	(.89)									
Preparation	,656**	,821**	(.84)								
Unity	,563**	,797**	,743**	(.88)							
total score	,797**	,952**	,900**	,878**	(.95)						
GEQ											
ATG-S	,220**	,318**	,285**	,324**	,328**	(.70)					
ATG-T	,328**	,386**	,374**	,369**	,412**	,231**	(.61)				
GI-S	,285**	,391**	,339**	,359**	,393**	,497**	,351**	(.71)			
GI-T	,424**	,644**	,600**	,658**	,664**	,421**	,418**	,506**	(.68)		
CSAI-2r											
Somatic anxiety	-,049	-,063	-,065	-,072	-,070	,026	-,042	-,055	-,076	(.81)	
Cognitive anxiety	-,097	-,080	-,044	-,117*	-,095	-,031	-,015	-,126*	-,143*	,452**	(.82)

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

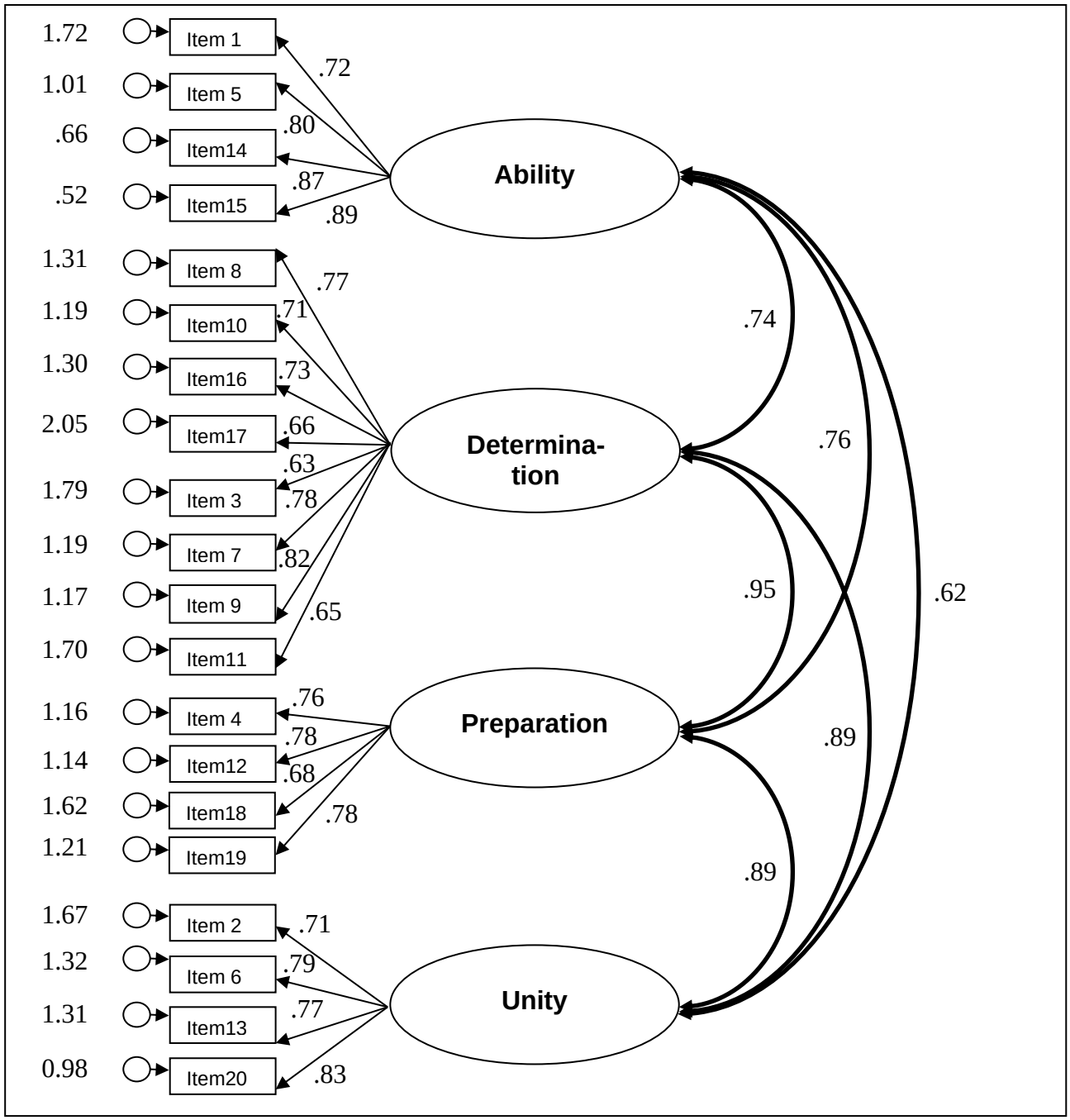

Figure 1. CEQS 4-factor lower order. Standardized estimates. Model fit: X^2=448.9(161); p < .001; *CFI*=0.93; *NNFI*=0.92; *IFI*=0.93; *RMSEA*=.077 [90% CI=.068-.085]; *AIC* = 586.88.

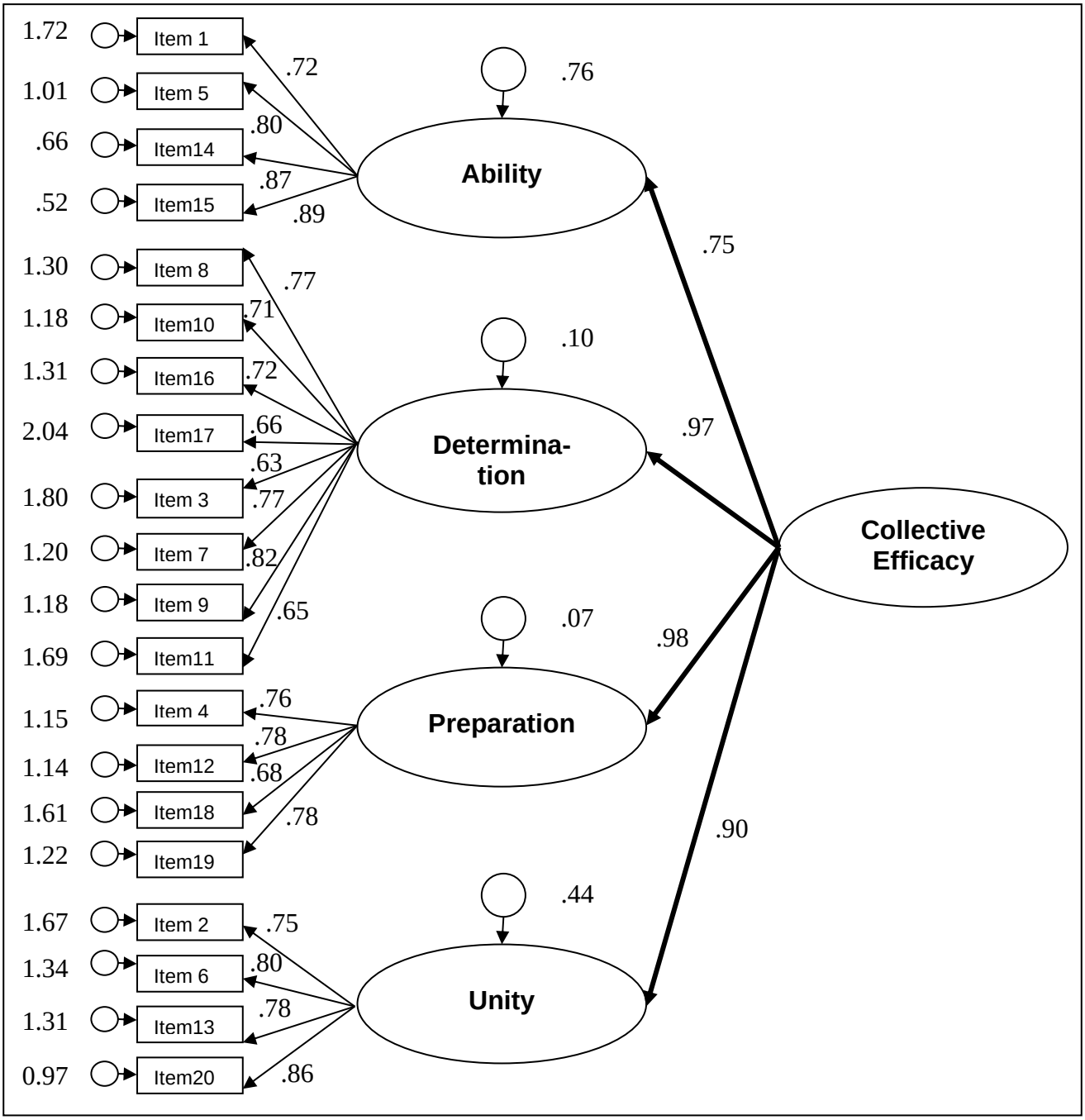

Figure 2. CEQS 4-factor higher order. Standardized estimates. Model fit: X^2=457.7(163); $p < .001$; *CFI*=0.93; *NNFI*=0.92; *IFI*=0.93; *RMSEA*=.077 [90% CI=.069-.085]; *AIC* = 591.66.