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Citation:

MALLIA, Luca, LAZURAS, Lambros, BARKOUKIS, Vassilis, BRAND, Ralf, BAUMGARTEN, Franz, TSORBATZOUDIS, Haralambos, ZELLI, Arnaldo and LUCID, Fabio (2016). Doping use in sport teams : the development and validation of measures of team-based efficacy beliefs and moral disengagement from a cross-national perspective. *Psychology of Sport and Exercise*, 25, 78-88. [Article]

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Doping use in sport teams: The development and validation of measures of team-based efficacy beliefs and moral disengagement from a cross-national perspective

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ARTICLE INFO

Article history:

Received 30 November 2015

Received in revised form 18 April 2016

Accepted 19 April 2016

Available online xxx

Keywords:

Adolescents

Self-regulatory efficacy

Collective efficacy

Confirmative factor analysis

Item development

Social cognitive theory

ABSTRACT

Objectives

The main goal of this research focused on the development and validation of three instruments designed to assess athletes' self-regulatory efficacy in team contexts, team collective efficacy and team moral disengagement with relevance for doping use across three European countries.

Design

The research relied on three distinct studies. A first qualitative study focused on item development. The second study assessed the factor structure and internal reliability of each of the new team instruments. The third study provided evidence for instrument validity by assessing the hypothesis that efficacy measures and moral disengagement would contribute to team athletes' doping intentions. The latter two studies also focused on the relations among measures and on measurement reliability, both within and across countries.

Method

The first study relied on focus group data collected from twenty-one team sport professionals (mean age = 34; SD = 11.65). Four hundred and fourteen adolescent athletes (mean age = 16.69; SD = 1.55) participated in the second study, whereas seven hundred forty-nine adolescent team athletes (mean age = 16.43; SD = 1.69) participated in the third study. For the latter two studies, team athletes were recruited across Italy, Germany and Greece and provided data on the new team measures. Only athletes participating in the third study provided data on doping intentions.

Results

and conclusions: The findings of the three studies supported the empirical goals of the investigation and provided evidence for the factor structure, reliability and validity of the team instruments. Furthermore, multi-group findings supported the hypothesis that the new instruments would have equivalent measurement and validity characteristics across the three European countries. The conclusions focus on the conceptual and practical implications of these findings.

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Sport is promoted as the hallmark of excellence and human virtues, and is believed to promote moral functioning and ethical behaviour (Kavussanu, Roberts, & Ntoumanis, 2002). Nevertheless, several studies have questioned the moral character-building properties of sport participation and showed that several sport behaviours can be classified as immoral or unethical, such as injuring an opponent, cheating, or faking an injury (Boardley & Kavussanu, 2007; Lee, Whitehead, & Ntoumanis, 2007; Shields & Bredemeier, 2007).

Doping represents a case of cheating in sport, and is considered to be unethical, illegal, and health-compromising (Maravelias, Dona, Stefanidou, & Spiliopoulou, 2005). Research on the underlying psychological processes has clearly acknowledged that doping use is a complex phenomenon that is partly due to the co-existence of conflicting value systems ranging from a need for performance enhance-

ment and the search for a competitive edge, to the desire to control the methods by which enhancement can be achieved (Heikkala, 1993; Petróczi & Strauss, 2015; Volkwein, 2005). Furthermore, scholars recognize that this complexity may inherently generate ambiguity between the expectation for high-performing athletes and the anti-doping rules which prohibit the use of a defined set of drugs and methods (Petróczi, 2013). Thus, performance enhancement, per se, is not necessarily condemned, and performance enhancement with permissible means (e.g., nutritional or herbal supplements, training methods, technological advancements, etc.) may, in fact, not only be tolerated but also actively supported throughout athletic career development (Petróczi, 2013).

As a result, the general view that values such as ethics, fair play or honesty, respect for self and others actually guide decision-making in sport has been largely challenged, and some scholars have suggested that, while values are relatively stable entities, their moment-to-moment priority over an athlete's life course may differ as a function of the complex interplay among individuals' personal characteristics,

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specific enacted behaviours, and ongoing social and environmental circumstances (e.g., Petróczki & Aidman, 2008). This broad perspective is currently shared by several theoretical frameworks in doping research (e.g., Barkoukis, Lazuras, Tsorbatzoudis, & Rodafinos, 2013; Chan et al., 2015; Lazuras, 2015; Lucidi, Zelli, & Mallia, 2013; Petróczki, 2013; Whitaker, Long, Petróczki, & Backhouse, 2014), and some of them have moved research forward by addressing the specific ways athletes' value priority changes over time and influences their cognitive and behavioural experiences (e.g., Petróczki, 2013).

Despite their specific characteristics, theoretical frameworks in doping research seem to share the general notion that doping use is a conscious, goal-directed behaviour (i.e., performance or appearance enhancement) that involves deliberate reasoning. Thus, despite being a clear violation of explicit ethical and legal norms (e.g., Backhouse, Patterson, & McKenna, 2012), an athlete may view doping use as an inevitable part of performance enhancement, and this view might be the expression of beliefs about particular physical, athletic or social demands of the moment and/or of personal evaluations about the extent to which one has the resources to pursue and to reach socially desirable sport objectives.

From a broad perspective, the conceptual model that has most explicitly conceived a dynamic three-fold interplay among the person, the environment and the behaviour is that of social-cognitive theory (Bandura, 1986). This framework has been largely utilized in the psychological study of doping use (Boardley, Grix, & Dewar, 2014; Lucidi, Grano, Leone, Lombardo & Pesce, 2004; Lucidi et al., 2013; Lucidi et al., 2008; Ntoumanis, Ng, Barkoukis, & Backhouse, 2014; Zelli, Mallia, & Lucidi, 2010). According to social cognitive theory, doping can be conceptualized as a form of transgressive behaviour that might be related to athletes' social contexts and self-regulatory capacities. In particular, the decision to use doping substances can be explained by the dynamic interplay among social and environmental or contextual factors (e.g., explicit and implicit norms, external pressures to use doping), along with personal factors, such as one's self-reflective capacities and internal standards for moral conduct (Barkoukis et al., 2013; Lazuras, 2015; Lazuras, Barkoukis, & Tsorbatzoudis, 2015).

The remaining sections of this introduction will briefly describe the constructs of social-cognitive theory that have thus far characterized the study of doping, propose that some constructs specifically referring to team dynamics have yet to be incorporated in doping research, and summarize the main characteristics of an investigation designed to empirically validate a set of team instruments that might move social cognitive research on doping forward.

1. Social-cognitive theory and doping use: the contribution of self-regulatory efficacy and moral disengagement

The construct of self-efficacy lies at the core of social cognitive theory and reflects one's perceived capacity to effectively regulate goal-directed behaviours (Bandura, 1997). Self-efficacy emphasizes the dynamic relationship between personal resources and capacities to perform (or inhibit) a behaviour, and the possible influence that can be ascribed to the surrounding environment or context wherein a particular behaviour takes place (Bandura, 1997). With respect to behavioural conduct, the construct of self-regulatory efficacy represents one's perceived capacity to cope with or overcome particular circumstances or situations that might be deleterious for the self (e.g., peer pressure to engage in unhealthy behaviours). Consistent with this definition, higher self-regulatory efficacy should be more likely to prevent or minimize risky behaviours than should lower self-regulatory efficacy. Indeed, self-regulatory efficacy has been associated with

positive behavioural outcomes in adolescence, such as prosocial behaviour, and with a reduction in delinquency and antisocial behaviour (Bandura, Caprara, Barbaranelli, Gerbino, & Pastorelli, 2003; Bandura, Caprara, Barbaranelli, Pastorelli, & Regalia, 2001).

Social cognitive theory also posits that moral reasoning plays an important role in the process of self-regulation by enabling people to monitor their intentions and action tendencies and to restrain those behaviours that are incongruent with personal standards or social norms (Bandura, 1986; Bandura, Barbaranelli, Caprara, & Pastorelli, 1996; McAlister, Bandura, & Owen, 2006). However, people often display behaviours of questionable morality or even behaviours that can be deemed illegal in specific contexts, such as an athlete engaging in doping use. At times, people who transgress and find no support from their social environment (e.g., peer support, social norms) may try to justify their behaviours by resorting to personal self-regulatory capacities. Moral disengagement (MD) is a self-serving self-regulatory process whereby people who transgress still believe they are acting morally (Bandura et al., 1986; 2001). In this perspective, MD serves a self-justification function that reduces the cognitive dissonance that may arise at those times people perform value-incongruent behaviours. Broadly, MD operates through distinct and interrelated mechanisms concerning a variety of behavioural dimensions such as the actual conduct (e.g., justifying the reprehensible conduct or comparing it to even worse misconduct), specific behavioural consequences (e.g., minimizing or ignoring the consequences of the misconduct), or the characteristics of the victim or target of the behaviour (e.g., dehumanizing or attributing blame to the victim). To date, a large body of evidence has shown that MD is prospectively associated with the display of immoral and antisocial behaviours, especially among adolescents (e.g., Gini, Pozzoli, & Hymel, 2014; Hyde, Shaw, & Moilanen, 2010).

In the domain of doping research, Lucidi et al. (2008) have longitudinally examined the predictive contribution that self-regulatory efficacy and moral disengagement may have on people's doping intentions and use. Their findings showed that higher baseline MD scores and lower self-regulatory efficacy scores uniquely contributed to adolescent athletes' doping intentions and self-reported doping use, over and above the effects of other social cognitive predictors, such as doping attitudes and social norms (Lucidi et al., 2008). Other studies independently confirmed the association between moral disengagement and doping use (e.g., Boardley et al., 2014; Boardley, Grix, & Harkin, 2015) and the effects that self-regulatory efficacy (e.g., resisting social situations that solicit doping use) have on athletes' doping intentions across different ages and sport levels (e.g., Barkoukis et al. 2013; Lazuras, Barkoukis, Rodafinos, & Tsorbatzoudis, 2010; Lazuras et al., 2015). Recently, a meta-analysis by Ntoumanis et al. (2014) provided further support for these findings and the importance of self-regulatory efficacy and moral disengagement. Finally, there also has been evidence supporting the hypothesis that efficacy and moral disengagement processes jointly and prospectively influence young athletes' doping intentions and behaviour (Lucidi et al., 2013; Zelli et al., 2010).

2. Self-regulatory processes in team sports

To date, social cognitive research on doping has largely focused on the self. That is, doping risk has been primarily examined with respect to personal goals and person-centred outcome expectancies. This narrow focus may have limited our understanding of more dynamic contextual influences that potentially shape athletes' doping decisions and experiences. In the sport context, this consideration seems particularly relevant to sport teams and to the possibility that

team athletes' beliefs, thoughts, and choices concerning doping may stem from the particular dynamics, norms and situations that characterize or unfolds within their own teams (e.g., Hauw, 2013; Kirby, Moran, & Guerin, 2011).

To the best of the authors' knowledge, no doping study has addressed athletes' self-regulatory processes, such as self-regulatory efficacy and moral disengagement, with measures framed around team dynamics (i.e., incorporating a team dimension in the measurement of doping-related self-efficacy and moral disengagement). And yet, there seem to be several reasons for taking this perspective. First of all, self-regulation is about regulating one's own goal-setting and goal-attainment in dynamic ways in response to specific contextual influences (Bandura, 1986). Furthermore, team level factors might influence team sport athletes' moral reasoning and behaviours across age groups. In line with these arguments, some studies have, for instance, shown that athletes' moral reasoning and judgments (e.g., judging the legitimacy of a behaviour) were strongly influenced by the perceived moral climate in the team (Kavussanu et al., 2002; Shields & Bredemeier, 1995). Similarly, the perceived motivational climate in a team (e.g., if the team is perceived to be performance-oriented vs. mastery-oriented) has been associated with athletes' views of team norms about the legitimacy of specific behaviours (Ommundsen, Roberts, Lemyre, & Treasure, 2003). With respect to doping use, a recent study has shown that athletes' perceived team norms influenced individual beliefs about doping use (Ohl, Fincoeur, Lentillon-Kaestner, Defrance, & Brissonneau, 2013). Finally, from a theoretical standpoint, goal attainment does not only depend on individual effort and goal-striving, but also on the interpersonal context wherein goal pursuit takes place. This principle implies that, in the context of a team, one's goal pursuit and attainment depends, at least partly, on the coordinated and joint efforts of the group/team.

These latter considerations are consistent with the construct of "collective efficacy," a social cognitive process that Bandura used to explain self-regulatory processes by taking into account the influence of one's significant social contexts (Bandura, 1997). More particularly, collective efficacy is concerned with the shared subjective belief among group members about the group's capability to organize and execute specific courses of action that will lead to goal-attainment (e.g., how individual athletes on a team perceive their team's capability to face and overcome a particular sport challenge). Collective efficacy can be assessed with respect to individual members' appraisals of their personal capabilities to execute a particular course of action in a group, and/or individual members' appraisals of their group's capacity to operate as a whole. The topic of collective efficacy in sport has been extensively investigated for its implications in sport performance (e.g., Fransen et al., 2015; Myers & Feltz, 2007; Myers, Feltz, & Short, 2004). Yet, so far no study has examined collective efficacy in relation to doping use.

In sum, the study of self-regulatory processes underlying doping use can benefit from a theoretical and empirical focus on team-based constructs and measurements. In this broad perspective, team dynamics can influence team athletes' self-regulatory processes concerning doping in three main and relatively distinct ways. In the first case, athletes' own teams might represent a challenge, as team members or coaches might solicit or encourage doping use (see Ntoumanis et al., 2014). Along these lines, it might be crucial to assess team athletes' perceived personal capacity to resist, manage or overcome this type of challenge (i.e., to assess team athletes' *self-regulatory efficacy* with respect to their own teams). In the second case, athletes' teams may stand as a resource to rely on, and athletes may hold strong efficacy beliefs about their teams. Along these lines, team athletes may strongly believe that their team is capable of standing against or over-

coming the risk of doping use, especially at times when the team is challenged by several possible problems such as, for instance, a period of "lows" in performance or the belief that doping use help other teams to be more competitive. Thus, it also might be crucial to assess team athletes' efficacy beliefs about their own teams (i.e., to assess team athletes' *collective efficacy* beliefs). Finally, team athletes may call upon a series of justifications for doping use, especially those suggesting that doping use is beneficial for the team. In other words, team contexts may indirectly influence team athletes' *moral disengagement* beliefs; and thus, it would be worth assessing these team-based MD beliefs.

The three team-anchored processes of self-regulation outlined above are all in line with social cognitive theory (Bandura, 1997, Bandura et al., 2001) and, theoretically, they might influence, both uniquely and jointly, team athletes' decision-making processes and action tendencies (e.g., intentions) about doping.

3. The present study

The present investigation focused on the development and validation of a new set of self-report measures of team athletes' regulatory efficacy, team collective efficacy and team moral disengagement. In order to gain independent evidence of these measures' quality, in terms of both measurement equivalence and the relations among the study's key variables, the investigation included team athletes from three different European countries (Italy, Germany, and Greece). As part of the same scientific effort, the present investigation also focused on the relations linking the new team measures to measures of team athletes' intentions to use doping substances in the near future.

These main objectives led to three distinct studies. The first one was a qualitative study focusing on item development, in which the authors conducted some focus groups with sport professionals and athletes and utilized doping-related themes of relevance to sport teams. The output of this first study led to versions of the new instruments to be used in each of the three European languages. The second study focused on an assessment of the psychometric characteristics of the new team instruments within and across the European countries. For this purpose, data were collected from athletes from each participating country and then utilized to analyze the factor structure and internal reliability of each of the new team instruments, as well as their measurement equivalence across the three national sites. The final study focused on the construct validity of the new team instruments and tested – with new samples of team athletes – the general hypothesis that regulatory efficacy, team collective efficacy, and team moral disengagement would contribute to team athletes' prospective doping intentions.

4. First study

The first study focused on a qualitative assessment of the constructs of interest. It took place in Italy and included focus group discussions with Italian sport professionals and athletes. The broad objective of this study was to identify construct dimensions that could be utilized for generating corresponding measurement instruments.

4.1. Method

4.1.1. Participants and procedures

Twenty-one team sport professionals, such as coaches, sports managers, team sport athletes and sports journalists were involved in three separate focus groups. These professionals had a professional experience in team sports for at least 8 years and were included for

their possible role in the “culture of doping” that society at large and team athletes may endorse. Nearly twenty-four percent of the participants were females (23.8%), and participants' average age was 34 years ($SD = 11.65$). Standard instructions invited focus group participants to describe critical sport team situations and circumstances in which young athletes might experience strong pressure to use doping substances. Participants also were invited to evoke circumstances in which doping use would not necessarily be condemned or, on the contrary, would be justified. Focus group protocols, as well as procedures and characteristics of the following two studies, were approved by the Ethics Review Board of the Department of Social & Developmental Psychology, ‘La Sapienza’ University of Rome.

4.1.2. Data analysis and results

4.1.2.1. Thematic analysis and item development

Focus group interviews were transcribed and analyzed via thematic analysis in order to identify themes relevant to the social cognitive processes under investigation. This phase of analysis was conducted separately by the first and the last author of the present research. The first author initially identified thematic categories (e.g., “*Pressures internal to team*”, “*Pressures external to team*”, “*Team related justification*”) referring to team circumstances or situations that encouraged or did not condemn doping use. Subsequently, the first author used an inductive analysis to determine lower-order, more specific, themes within each category (e.g., for “pressure internal to team” category, the more specific theme was “other teammates use substances”). The last author, who was experienced in qualitative data analysis, offered further insight and interpretations of the emerging themes. This independent analysis was not intended as a formal test of the “reliability” or “validity” of the themes being identified. Rather, it was intended to offer an experienced check of the theme identification process.

The thematic analysis of focus group transcripts evidenced two main themes. The first was concerned with situations and circumstances in which young team athletes might perceive significant others on their team (e.g., coach, a teammate, medical staff) as an “*internal to the team*” source of pressure. The second theme, instead, was concerned with situations and circumstances in which young team athletes might perceive their own teams as a “*protective resource*” in the face of possible doping use among athletes from other teams. These themes led to the development of two distinct 6-item social cognitive scales. The first scale was intended to measure team athletes' “*Self-regulatory Efficacy*” in team contexts (T-SRE), that is, athletes' personal confidence in avoiding doping use even when, for instance, other teammates would use or solicit the use of prohibited substances. The second 6-item scale was instead intended to measure athletes' confidence towards their own teams (i.e., collective efficacy; T-CE). In particular, items measured team athletes' confidence in their teams' capacity to resist and effectively cope with external pressures to use doping substances (e.g., “*On my team, we would be able to avoid using doping substances, even if we believed or knew that other teams were using them*”).

In a similar vein, the thematic analysis of focus group transcripts provided clear information on the circumstances and ways in which team athletes may justify doping use, thus supporting the possibility of developing a team-based moral disengagement questionnaire. Consistent with past research (Lucidi et al., 2008), these team-bounded circumstances tapped into six of the eight moral disengagement mechanisms originally theorized by Bandura (i.e., moral justification, euphemism, exonerative comparison, displacement and diffusion of

responsibility, and misrepresenting the harm). The thematic analysis of focus group transcripts led to a 6-item version of the “*Team Moral Disengagement*” (T-MD) questionnaire. Illustratively, the item “*On a team, the responsibility of using doping substances or not is up to the group and not the individual,*” measured the mechanism of *diffusion of responsibility*.

4.1.2.2. Face and content validity

The three new team scales were first translated from Italian to English, using a translation-back translation method (Hambleton, 2001). The English version was checked for linguistic equivalence by bilingual experts in the field, and it was then used as a reference for the translation of the scales into German and Greek languages. Again, translations were completed using the translation-back translation method and inspected by bilingual academic experts in each country.

Following this translation phase, both team athletes and academic experts in each country examined the face and content validity of the new team instruments. In particular, a group of ten team athletes evaluated the new team items in terms of clarity, realism and specificity, that is, the extent to which they depicted or referred to situations possibly leading to doping use. Academic scholars with recognized experience in social-cognitive theorizing, had to complete two separate evaluation tasks. For the new moral disengagement instrument, they had to identify the moral disengagement mechanism referred to in each item, while for the set of items included in the new self-regulatory and collective efficacy instruments, scholars had to guess each item's correct social cognitive construct. Overall, team athletes acknowledged the scales' items clarity, realism, and specificity. Likewise, academic scholars correctly assigned the scales' items to the psychological process (i.e., self-regulatory efficacy, collective efficacy and moral disengagement) they were designed to measure.

5. Second study

The first study allowed the authors to develop three distinct instruments focusing on team dynamics and designed to provide data on team athletes' a) regulatory efficacy in face of threats or challenges about doping use coming from their own teams (T-SRE), b) perceived confidence in their own teams' collective capacity or efficacy to withstand challenges about doping use (T-CE), and c) personal ways to morally justify doping use in the face of or to serve their own teams' competitive or sport-related interests (i.e., moral disengagement; T-MD).

The second study was designed to assess the factor structure and internal reliability of each of these three team instruments, and to do so both across and within the three European countries participating in the study (i.e. Italy, Germany and Greece).

5.1. Method

5.1.1. Participants and procedures

Four hundred and fourteen adolescent team athletes (mean age = 16.69; $SD = 1.55$) were recruited across Italy ($n = 139$; 33.57%), Germany ($n = 153$; 36.96%) and Greece ($n = 122$; 29.47%) to provide data on the three team instruments developed in the first study. Participants primarily practiced soccer ($n = 213$; 51.4%), volleyball ($n = 90$; 21.7%), basketball ($n = 99$; 23.9%), or handball ($n = 12$; 2.9%). Across the three national contexts, samples were recruited via a convenience sampling procedure. In particular, research personnel in each country first approached sport club managers and team coaches and, after informing them about the research, sought

their support and consent for conducting the study with their teams/clubs. Second, in line with ethics guidelines for behavioural research, a consent letter describing the study was sent to the adolescent athletes' parents asking them to give permission for the athletes' participation. Finally, athletes for whom parental consent was obtained were informed about their participation rights, such as voluntary participation, data confidentiality and anonymity, as well as the right to withdraw from the study at any time and without prior notice. Descriptive statistics regarding the socio-demographic characteristics of this sample are reported in Table 1. All participants filled out an anonymous questionnaire lasting about 20 min.

5.1.2. Measures

The three team instruments developed for this study are included in Appendix 1.¹ For each instrument, the appendix shows the 6 items included in the instrument. The first 6-item instrument provided data on "Self-Regulatory Efficacy" in team contexts (T-SRE), that is, athletes' personal confidence in avoiding doping use even when, for instance, other teammates would use or solicit the use of prohibited substances; The second 6-item instrument provided data on team athletes' confidence in their teams' capacity to resist and effectively cope with external pressures to use doping substances (i.e., "Collective Efficacy"; T-CE); the third 6-item instrument provided data on "Team Moral Disengagement" (T-MD), that is, team athletes' tendency to justify doping use in the presence of motives or reasons calling upon their teams' specific demands, needs or circumstances.

For the first two instruments, athletes rated their confidence on a 7-point Likert-type scale ranging from 1 ("Not at all able") to 7 ("Completely able"). For purposes of analysis, item score data from each set were aggregated into a single scale score, for which higher values indicated stronger regulatory and collective efficacy beliefs, respectively. For the moral disengagement instruments, participants rated each T-MD item on a 7-point Likert-type scale ranging from 1 ("I do not agree at all") to 7 ("I completely agree"). For purposes of analysis, T-MD item score data were also aggregated into a single scale score for which higher scores indicated greater moral disengagement.

5.1.3. Data analysis

Confirmatory factor analyses (CFA) of the new measures were conducted using MPLUS software (Version 7; Muthén & Muthén, 2012). An initial CFA was conducted using data from the entire sample (N = 414). This CFA examined the measurement hypothesis that each 6-item set measured only one latent factor (i.e., the model implied a "regulatory efficacy", a "collective efficacy", and a "moral disengagement" factor) and that the three latent factors were correlated with each other. This measurement model is depicted in Fig. 1. Model parameters were estimated using the maximum likelihood (ML) estimation method, and the quality of the measurement model was visually examined through the fit indices estimates of TLI (Tucker–Lewis index), CFI (comparative fit index), RMSEA (root mean square error of approximation), and SRMR (standardized root mean square residual) (Hu & Bentler, 1999). Model fit was also evaluated by calculating the χ^2/df ratio of the model, which tends to correct for the typical sensitivity to sample size of this type of analysis.

A second CFA of the model was also performed to verify the additional measurement hypothesis that there was measurement invariance across three national sites (i.e., the measurement structure of the

team instruments holds equally well in each European country). In line with the literature (e.g., Byrne, 2008), this multi-group CFA tested the *configural equivalence* (i.e., the number of factors and their loading pattern are invariant across groups) and the *measurement or metric equivalence* (i.e., all the factor loadings are invariant across groups).²

6. Results

The CFA conducted on the entire sample of team athletes showed that the three-factor measurement model fit the data well ($\chi^2_{(132)} = 394.35$, $p < 0.001$; $\chi^2/\text{df} = 2.99$, CFI = 0.95, RMSEA = 0.069, 90% CI: from 0.062 to 0.077, SRMR = 0.045), that the three sets of items loaded significantly on their corresponding latent factor, and that the three latent factors were significantly correlated with each other. Fig. 1 shows the details of these results. This analysis, in other words, supported the general notion that the new team instruments measured quite well the three social cognitive factors that were hypothesized in the present investigation.

Table 2 also shows the results of the multi-group CFA which was performed to verify measurement equivalence across the three European countries.³ The CFA supported the hypothesis of *configural equivalence*, that is, the three-factor hypothesis that item response data for each of the three team instruments only loaded significantly on the expected latent factor, and this held true in Italy, in Germany and in Greece, $\chi^2_{(426)} = 1037.61$, $p < 0.001$; $\chi^2/\text{df} = 2.44$, CFI = 0.90, RMSEA = 0.010, 90% CI: from 0.09 to 0.11, SRMR = 0.07. The multi-group CFA did not, however, fully support the hypothesis of invariance in *measurement equivalence* (i.e., the hypothesis that factor loadings are statistically equivalent across countries). In fact, when the model was revised to include the constraints of loading equality, the model's fit indices overall worsened, $\chi^2_{\text{diff}(30)} = 71.82$, $p < 0.001$. Upon a visual examination of the CFA modification indices obtained (i.e., estimates providing information on problematic items), this null finding seemed to be due to problems with item data from Greece (i.e., item 3 of "Self-Regulatory Efficacy" scale, and item 2 of "Collective Efficacy" scale). In other words, these two items loaded on the expected factor in each country, even though the loading size was only statistically equivalent in Italy and Germany. For these reasons, a second multi-group CFA was performed after releasing the equality constraints for these two problematic items (i.e., they were freely estimated). Results of this analysis suggested that there was a *partial measurement equivalence* across the three national samples, as evidenced by an improved chi-square difference, χ^2

² In testing invariance, each model including a specific constraint (e.g., equivalence of the factor loadings) is nested into a model without this constraint, and thus the two models can be compared by the chi-square difference test, using the difference in their χ^2 values and in their degrees of freedom. If chi-square difference value is statistically significant, it suggests that the constraint included does not hold (i.e., is not equivalent) across groups. Conversely, if the chi square difference value is statistically non-significant, this finding suggests that the specific equality constraint included is tenable across the groups. In order to establish the significance of the chi-square difference test, we set the critical p-level to 0.01.

³ Following one of the reviewers' suggestions, an additional CFA multi-group analysis tested the possibility of measurement equivalence across different sport categories, namely, soccer (n = 213), volleyball (n = 90), and basketball (n = 99). The results supported the *configural equivalence* ($\chi^2_{(426)} = 949.91$, $p < 0.001$; $\chi^2/\text{df} = 2.23$; CFI = 0.90; RMSEA = 0.096, 90% CI: from 0.088 to 0.10; SRMR = 0.083), as well as the *measurement equivalence* ($\chi^2_{\text{diff}(30)} = 34.58$, $p = 0.26$) across categories.

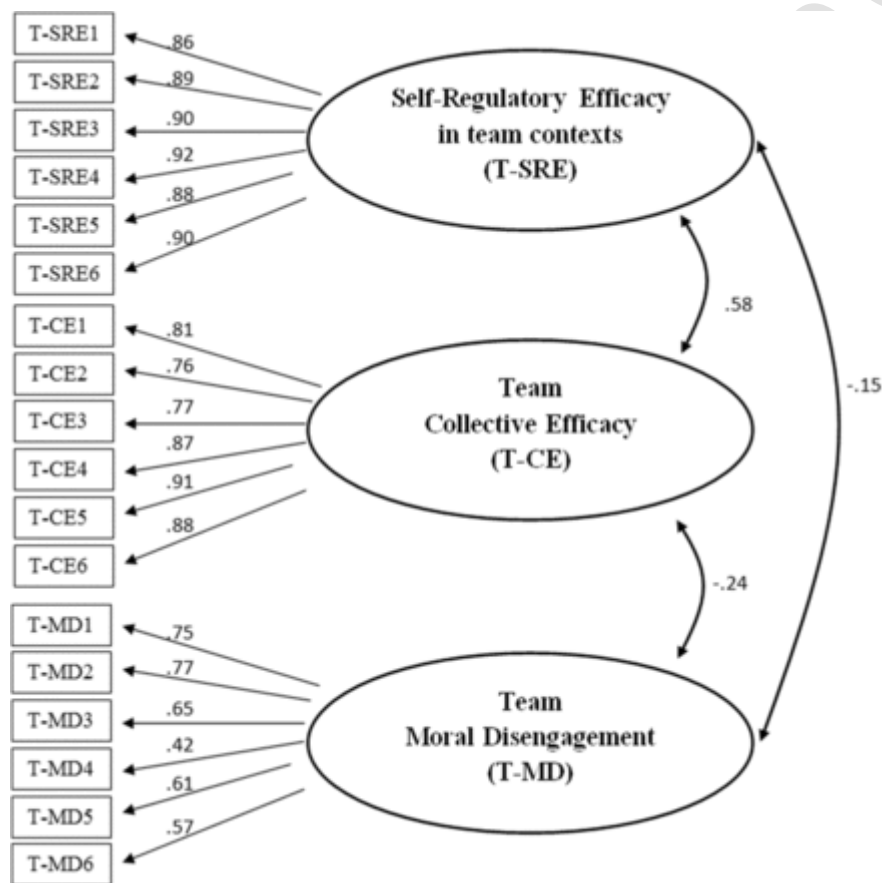
¹ Italian, German and Greek versions of the instruments can be requested by e-mail from the corresponding author of the paper.

Table 1

Socio demographic and sport related variables of the samples involved in study 2 and study 3.

	Age Mean (SD)	Years of sport practice Mean (SD)	Years of experience in own team Mean (SD)	Weekly days of training Mean (SD)	Weekly hours of training Mean (SD)	Number of competitions in a month Mean (SD)
First study sample (n = 414)						
a) Italy	16.53(1.42) ^{b,c}	6.88 (3.07) ^{b,c}	3.38 (2.00) ^{b,c}	3.19 (0.84) ^{b,c}	5.84 (1.47) ^{b,c}	4.92 (1.77) ^b
b) Greece	17.58 (1.45) ^{a,c}	9.08 (2.87) ^{a,c}	5.32 (3.39) ^{a,c}	4.29 (1.40) ^{a,c}	7.86 (4.27) ^{a,c}	3.86 (1.27) ^{a,c}
c) Germany	16.13 (1.44) ^{a,b}	10.12 (2.41) ^{a,b}	8.70 (2.88) ^{a,b}	4.89 (0.94) ^{a,b}	11.05 (4.19) ^{a,b}	4.74 (1.74) ^b
Second study sample (n = 749)						
a) Italy	16.05 (1.46) ^b	5.94 (3.11) ^{b,c}	4.07 (2.54) ^c	3.78 (1.01)	6.92 (2.86) ^c	4.54 (2.08) ^b
b) Greece	17.38 (1.69) ^{a,c}	7.64 (2.88) ^{a,c}	3.97 (2.35) ^c	3.84 (1.23)	6.96 (3.00) ^c	4.03 (1.31) ^a
c) Germany	16.01 (1.64) ^b	9.63 (3.38) ^{a,b}	8.32 (3.70) ^{a,b}	3.93 (0.94)	8.02 (3.40) ^{a,b}	4.23 (2.43)

Note. ^{a, b, c} Different letters across means represent significant differences in sport experiences and practice, at LSD post-hoc test ($p < 0.05$).

**Fig. 1.** The measurement model tested with Confirmatory Factor Analyses (CFA).

diff (28) = 45.45; $p = 0.02$. Table 2 shows, for each team instrument, the standardized factor loadings that were invariant across the three national sites. As one can see, all factor loadings for each latent variable were statistically significant ($p < 0.001$) and were above 0.32, which is the minimum acceptable value for a factor loading, according to existing literature (Tabachnick & Fidell, 2007). Finally, Table 2 also shows that the Cronbach's alpha coefficients for each set of items were at quite acceptable reliability levels in each national sample. Overall, even though the hypothesis of measurement equivalence was not fully supported, the results clearly suggested that 16 of the 18 new team items had equivalent measurement properties in each of the three European countries.

7. Discussion

The findings of this second study provided adequate evidence in support of the factorial validity and reliability of the new team measures. Furthermore, with the exception of a marginal component (i.e., two items in the Greek dataset), a series of multi-group CFA also substantially supported the hypothesis that the measurement qualities of these new team instruments hold quite well among athletes practicing team sports in each of the three European countries that participated in the study (i.e., Italy, Greece, and Germany).

This second study, however, did not provide any evidence for the construct validity of the new team instruments addressed by the present research. In other words, it did not address whether team ath-

Table 2

Factor loadings and internal reliability of each of the three new instrument, across the three European countries participating to the study (i.e. Italy, Germany and Greece).

	Multigroup-CFA factor loadings		
	IT	GR	GE
1) Self-Regulatory Efficacy in team contexts (T-SRE)			
I would be able to resist the temptation to use doping substances			
1. ... even in the case in which all my teammates are using these substances.	0.80	0.90	0.90
2. ... even if this would mean to lose my starter position on the team.	0.90	0.86	0.89
3. ... even when my team captain is the one asking me to do so.	0.90	0.79 ^a	0.95
4. ... even when my coach is the one asking me to do so.	0.90	0.91	0.95
5. ... even in the case in which I realized that my teammates are becoming better than me because of doping use	0.85	0.86	0.90
6. ... even if I thought that it was the only way to step up for the team	0.88	0.87	0.94
Cronbach's Alpha	0.95	0.95	0.97
2) Team Collective Efficacy (T-CE)			
On my team, we would be able to ...			
1. ... avoid using doping substances, even if we believed or knew that other teams were using them	0.79	0.85	0.78
2. ... recognize our limits and avoid overcoming them by the use of doping substances	0.80	0.64 ^a	0.82
3. ... discourage those teammates who would be willing to use doping substances to win	0.74	0.88	0.77
4. ... protect each other against the risk to use doping	0.81	0.90	0.90
5. ... make clear to everyone that our team is against any form of doping	0.88	0.94	0.92
6. ... face difficult times without taking shortcuts such as doping	0.88	0.87	0.88
Cronbach's Alpha	0.90	0.92	0.93
3) Team Moral Disengagement (T-MD) scale			
On a team ...			
1. ... doping use is better than betraying your teammates' effort and pursuit for victory (<i>Exonerative comparison</i>)	0.63	0.78	0.80
2. ... doping use is just another good way to "keep the group together" (<i>Euphemism</i>)	0.73	0.74	0.79
3. ... a player cannot say "no" to doping use when the coach or the teammates ask him/her to do it (<i>Displacement of responsibility</i>)	0.73	0.81	0.56
4. ... the responsibility of using doping substances or not is up to the group and not the individual (<i>Diffusion of responsibility</i>)	0.44	0.36	0.44
5. ... a player who uses doping substances to help his or her team can be justified (<i>Moral justification</i>)	0.56	0.65	0.57
6. ... doping use does not ruin other teams' chances to win, as other teams also use doping (<i>Misrepresenting the harm</i>)	0.54	0.61	0.67
Cronbach's Alpha	0.71	0.80	0.74

Note. IT = Italy GR = Greece; GE = Germany.

^a Factor loadings that resulted to be not invariant in the multi-group CFA. All the factor loadings and co-variances are significant for $p < 0.005$.

letes' regulatory efficacy, their judgments about the team's collective capacity to stand against doping use, or their moral disengagement views about doping use in face of particular teams' circumstances or motives would be associated with other theoretically relevant doping

variables. To this end, we conducted a third study in order to assess the general hypothesis that these team-based social cognitive variables would contribute to team athletes' prospective intentions to use doping substances.

8. Third study

As already mentioned, the core goal of the third study was concerned with the possibility that team athletes' self-regulatory efficacy, their personal judgments of their teams' collective efficacy, and team moral disengagement might uniquely predict team athletes' prospective intentions to use doping substances. In other words, the third study attempted to test criterion validity in terms of concurrent validity. This goal led to the statistical test of a hypothetical structural equation model, in which each of the three team variables uniquely influenced team athletes' doping intentions. Again, as in the second study, this hypothesis was tested within and across the three European countries participating to the study (i.e., Italy, Greece and Germany).

8.1. Method

8.1.1. Participants and procedures

Seven-hundred forty-nine team athletes, aged between 14 and 20 years (Mean age = 16.43; SD = 1.69), participated in this study across Italy (n = 351), Germany (n = 281) and Greece (n = 216). Overall, athletes practiced soccer (n = 215; 28.80%), volleyball (n = 201; 26.9%), basketball (n = 177; 23.7%), handball (n = 55; 7.4%), water polo (n = 67; 9%) and rugby (n = 31; 4.2%). Furthermore, these athletes were involved in competitions, either at the local level (45.69%), the regional level (40.57%) or the national level (13.74%). The sampling, data collection, and ethics procedures were the same ones that were used in the second study. Descriptive statistics of the socio-demographic characteristics for this study sample are shown in Table 1.

8.1.2. Measures

In addition to the new team measures, team athletes in this study provided data on their intentions to use doping substances in the near future. In particular, in line with past studies (Lucidi et al., 2010; 2013), athletes responded to three separate doping intention items measuring the likelihood of using doping substances during the next sport season (i.e., "What is the probability that you will ... /How strong is your intention to .../Do you think that you will decide to ... use substances to improve your sport performance/your physical condition in the next sport season?"). Responses to each item were recorded on a 5-point Likert scale ranging from 1 ("not at all strong/likely") to 5 ("very strong/likely"). Item scores were aggregated into a mean scale score, for which higher values indicated stronger doping intentions. Descriptive statistics and reliability coefficients for all the four measures are reported in Table 3.

8.1.3. Data analysis

The key interest of the study was the assessment of a hypothetical structural equation model in which team athletes' self-regulatory efficacy, team collective efficacy, and team moral disengagement were correlated with each other and directly predicted athletes' prospective doping intentions (see Fig. 2). This model was tested using MPLUS software (Version 7; Muthén & Muthén, 2012). In addition, a second structural equation model analysis tested whether the hypothetical model would be "invariant" across the three national sites participat-

Table 3

Descriptive statistics, reliability and zero-order correlations among all the key measures across of the third study.

	Mean (DS)	Cronbach's Alpha	Zero order correlations		
			(1)	(2)	(3)
(1) Self-Regulatory Efficacy in team contexts					
a) Italy	5.17 (2.04)	0.96	–		
b) Greece	5.09 (2.02)	0.97	–		
c) Germany	5.26 (2.03)	0.98	–		
(2) Team Collective Efficacy					
a) Italy	5.63 (1.45) ^{b,c}	0.91	0.42**		
b) Greece	5.19 (1.79) _{a,c}	0.92	0.38**		
c) Germany	6.04 (1.44) ^a _b	0.95	0.56**		
(3) Team Moral Disengagement					
a) Italy	1.81 (0.98) ^b	0.75	–0.17**	–0.22**	
b) Greece	2.45 (1.29) ^{a,c}	0.78	–0.25**	–0.31**	
c) Germany	1.86 (0.82) ^b	0.53	–0.10	–0.16**	
(4) Intentions					
a) Italy	1.31 (0.68) ^b	0.83	–0.23**	–0.21**	0.35**
b) Greece	1.64 (0.91) ^{a,c}	0.91	–0.39**	–0.29**	0.35**
c) Germany	1.19 (0.45) ^b	0.82	–0.23**	–0.24**	0.26**

Note. ^{a, b, c} Different letters across means represent significant differences at LSD post-hoc test ($p < 0.05$).

** $p < 0.001$.

ing to the study. The hypothesis of model invariance implied that the patterns of relations among the key variables substantially and statistically held well in Italy, Germany and Greece. Finally, a series of one-way ANCOVAs was performed in order to assess possible average differences in the key variables across Italian, German and Greek team athletes. In these analyses, group differences were assessed while controlling for the relations of each key variable of the study with age and sport-related variables, such as years of practice, years of experience in one team, weekly hours of training, or number of competitions in a month.

9. Results

9.1. The predictive effects of the new team variables on athletes' doping intentions

The results of the first SEM analysis overall supported the hypothesis that the new team variables predicted team athletes' prospective intentions about doping use. The pattern of relations generated by the hypothesized model of effects fitted the input data sufficiently well, $\chi^2_{(203)} = 942.76$, $p < 0.001$, $\chi^2/df = 4.64$, CFI = 0.94, RMSEA = 0.07, 90% CI: from 0.065 to 0.074, SRMR = 0.05). Furthermore, athletes' team moral disengagement and perceived capacity to resist team pressure (i.e. team athletes' self-regulatory efficacy) uniquely and significantly predicted athletes' prospective intentions to use doping substances. These latent estimates were in the expected directions, suggesting that stronger moral disengagement views would lead to stronger doping intentions, and that stronger self-efficacy beliefs would lead to lower doping intentions. Unexpectedly, as Fig. 2 shows, team athletes' views about their teams' collective efficacy did not uniquely predict athletes' doping intentions.

The results of the second SEM analysis suggested that this pattern of relations held quite well among team athletes from each of the three European countries participating in the study (i.e., athletes from Italy, Greece, and Germany). Illustratively, when performing this type of multi-group analysis, a model in which estimates are fixed to be equal across groups is compared to a model in which these constraints are released. If the hypothesis of equivalence of estimates holds true, the difference between the two models' chi-squares must not be statistically significant. This is exactly what it was found in the analysis comparing the model's estimates across Italy, Germany and Greece, $\chi^2_{diff(6)} = 3.18$, $p = 0.78$. Table 4 shows the separate path coefficients of the hypothesized model for the Italian, German and Greek team athletes, as well as the portion of the explained variance in athletes' prospective doping intentions that is accounted for by these hypothesized relations.

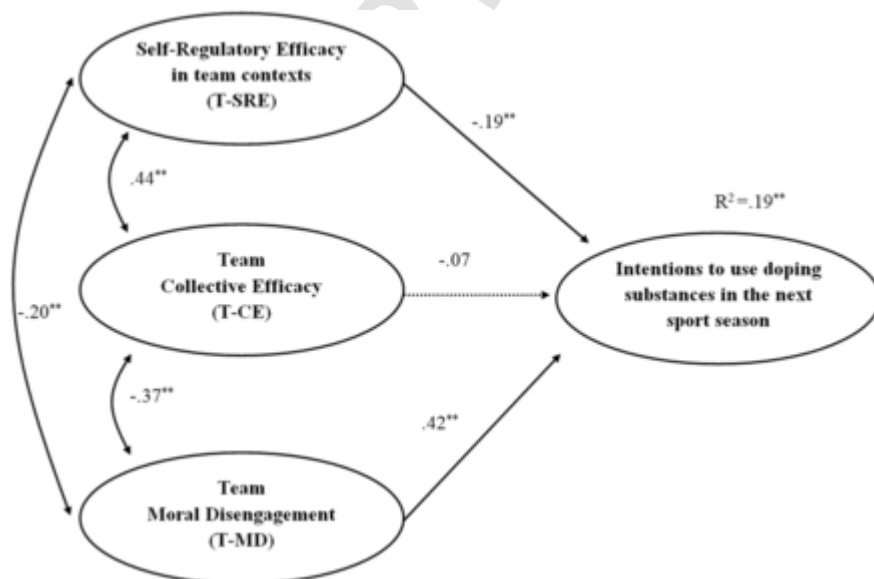


Fig. 2. SEM results for the model hypothesizing that team athletes' self-regulatory efficacy, team collective efficacy, and team moral disengagement directly predicted athletes' prospective doping intentions. Note. ** $p < 0.001$.

Table 4

The invariant effects of socio-cognitive variables on team athletes' prospective intentions across Italy, Germany and Greece sample.

	Intention to use doping substances in the season		
	Italy	Greece	Germany
Self-Regulatory Efficacy in team contexts	-0.15*	-0.11*	-0.22*
Team Collective Efficacy	-0.07	-0.08	-0.10
Team Moral Disengagement	0.38*	0.42*	0.21*
Perspective intention's variances explained (R^2)	0.21	0.25	0.16

Note. * $p < 0.05$.

9.2. Differences in self-regulatory processes and doping intentions between countries

The series of one-way ANCOVAs showed that the covariate characteristics of athletes' sport activities (e.g., years of experiences, hours of training) had significant relations with new team variables and with athletes' doping intentions (i.e., the dependent variables in the ANCOVAs models). In particular, there was a statistically significant relation between athletes' years of sport activity and self-regulatory efficacy ($F_{(1,741)} = 5.00$, $p = 0.03$, partial eta square = 0.01), between athletes' weekly training hours and teams' collective efficacy ($F_{(1,741)} = 5.66$, $p = 0.02$, partial eta square = 0.01), between athletes' age and team moral disengagement ($F_{(1,741)} = 7.54$, $p = 0.006$, partial eta square = 0.01), and between athletes' years of experience within the current team and athletes' doping intentions, $F_{(1,741)} = 4.00$, $p = 0.046$, partial eta square = 0.01.

With respect to possible differences across Italian, German and Greek team athletes, the ANCOVAs showed statistically significant country mean differences in athletes' judgments of their teams' collective efficacy, $F_{(2,741)} = 6.26$, $p = 0.002$, partial eta square = 0.02. On average, each country group differed significantly from each other, and German team athletes held the strongest collective efficacy beliefs about their own teams, followed by Italian and Greek team athletes, in that order. There also were statistically significant country mean differences in athletes' judgments of team moral disengagement, $F_{(2,741)} = 28.84$, $p < 0.001$, partial eta square = 0.08. In particular, Greek team athletes displayed the highest team moral disengagement beliefs, and they significantly differed from both Italian and German athletes (moral disengagement scores from the two latter groups did not statistically differ). Finally, Greek team athletes also reported, on average, the strongest intentions to use doping substances in the near future, and they significantly differed from their German and Italian counterparts, which instead were statistically equivalent to each other, $F_{(2,741)} = 21.20$, $p < 0.001$, partial eta square = 0.06. The ANCOVAs instead did not show any statistically significant country mean differences in team athletes' self-regulatory efficacy ($F_{(2,741)} = 1.09$, $p = 0.34$).

10. Discussion

Overall, the SEM findings of the study supported the two distinct hypotheses being tested, namely, the hypothesis of predictive relations linking the new team variables to athletes' doping intentions and the hypothesis that these relations would hold well among team athletes from each of the three European countries. With regards to the first hypothesis, however, it is important to point out that athletes' views about their teams' capacity to resist to external pressure toward

doping use (i.e., team collective efficacy) did not uniquely predict athletes' intentions to use doping substances, as was expected. This unexpected finding was probably due to the inter-correlations among the three new team variables (see Table 3) that may quite plausibly have led to a so-called "suppressor effect" (Cohen & Cohen, 1983).

From a measurement perspective, the findings of the third study added significant value to the findings of the second study in supporting the general notion that the new team measures are valid. Evidence of the factor structure and reliability of the new team measures found in study 2 was paralleled by the evidence found in study 3 that two of the three team variables uniquely predicted athletes' doping intentions, thus supporting the hypothesis of concurrent validity. Likewise, the finding of invariance in the factor structure of the new team measures in the second study was paralleled by invariance in the predictive relations linking the new social cognitive measures to team athletes' doping intentions in the third study. This latter finding is important, as the three countries do not only differ in linguistic terms, but may also differ with respect to culture-specific values, norms and attitudes towards doping use and prevention (Bloodworth & McNamee, 2010). These latter considerations suggest that the concurrent validity of the new team measures is generalizable across the three European countries. Although we did not directly control for cultural differences (e.g., values, norms), it is still noteworthy that the self-regulatory, social cognitive processes under investigation were linked in similar ways across countries and were potentially independent of culture-specific influences.

11. General discussion

The present investigation is consistent with a very clear and long-standing theoretical perspective in the understanding of behavioural functioning, namely, that of social-cognitive theory. Consistent with the main tenets of this theory, the present investigation focused on sport team dynamics and on the possibility that an athlete's personal views or beliefs about doping use may at least in part depend on the particular contextual characteristics or features of sport teams.

With these possibilities in mind, the authors of the present investigation conducted a series of studies focusing on the development and validation of a set of new paper-and-pencil instruments. In this empirical effort, the authors' attention was on three distinct types of team athletes' beliefs. One of them was concerned with team athletes' views about their *personal capacity* to resist solicitations or pressure to use doping substances coming from key actors of their team environment (e.g., a teammate). This belief represented what authors referred to as team *self-regulatory efficacy*. The second type of belief was concerned with team athletes' views about their *teams' capacity* to resist the temptation of using doping substances, especially when the team experiences challenging circumstances or environments (e.g., knowing that members of other teams have used doping substances). This belief represented what authors referred to as *team collective efficacy*. Finally, the third type of belief was concerned with the possibility that team athletes would justify doping use, especially when it would serve their teams' interest or welfare. This belief represented what authors referred to as *team moral disengagement*.

The findings of the present investigation provided encouraging evidence on the soundness and validity of the new set of belief instruments. In particular, the team-based beliefs, which were the focus of the present investigation, seemed to reliably characterize team athletes' mental representations about doping use. Furthermore, these beliefs also seemed to contribute to athletes' decision-making, insofar they predicted athletes' intentions to use doping substances in the near future. Finally, both the reliability and the validity of the new team

instruments also seemed to be strengthened by the similarity of findings across three independent samples of team athletes recruited in three different European countries.

Taken together, the findings of this empirical investigation provide some insights for theoretical advancements or integrations. In terms of theoretical advancement, our research incorporated a team dimension in self-regulatory mechanisms that may underlie doping use. In such a way, the investigation may advance past work on doping use that only in part addressed the dynamic interplay between contextual influences and individual self-regulatory capacities (e.g., Judge et al., 2012; Lazuras et al., 2010; Lucidi et al., 2013; Ntoumanis et al., 2014; Wiefferink, Detmar, Coumans, Vogels, & Paulussen, 2008; Zelli et al., 2010). The present research also reinforces the interest in the normative and situational factors that may negatively influence athletes' doping use and in the self-regulatory processes that may counteract these effects. This research perspective necessarily requires, in the future, a careful scrutiny of the possible differences across team sports, age groups and levels of sport (e.g., amateur, pre-elite, elite sports). Finally, the team-based self-regulatory processes that the new instruments tapped into can be integrated with other frameworks used in doping research. For instance, moral disengagement and self-regulatory efficacy have been successfully integrated with variables from the theory of planned behaviour (Lucidi et al., 2013, 2008; 2010; Zelli et al., 2010). In a similar vein, the team athletes' self-regulatory efficacy, perceptions of their own teams' collective efficacy and team moral disengagement might be integrated with the theory of planned behaviour or related models of individual decision-making, in order to account for specific team-related contextual influences. Additionally, our investigation might be used as the basis for research on groups' intentions, an emerging concept in applied social psychological research that describes the processes underlying collective decision-making and action initiation (Bagozzi & Dholakia, 2002).

11.1. Limitations

There are some limitations in the present investigation that can spawn further research. The present investigation only addressed a few team sports and left out others, such as cycling, rowing, or gymnastics. As team sports may widely vary on certain organizational or performance characteristics, additional studies will be needed to verify the utility of the new team instruments in other team sports. On a similar note, the present investigation relied on samples of team athletes that were quite different in terms of sample characteristics (e.g., training hours, years of sport experience, years with the current team). Needless to say, these sample characteristics have implications for any conclusions on the cross-national strength of the findings. Furthermore, the present investigation was not designed longitudinally and, therefore, any conclusions about the instruments' validity that the findings of the third study may have suggested (i.e., implications drawn from the predictive relations with athletes' doping intentions) must be taken with great caution. The present work also had no proxy data on athletes' actual doping use and, as such, the investigation's implicit reference to its theoretical value for doping use research is only prospective at this time. Finally, the investigation only focused on team athletes' personal evaluation of team collective efficacy, while a team-level evaluation of collective efficacy was not included. In other words, the present research did not include a true team-level variable. The standard procedures suggested by Bandura (1997) recommend to aggregate the individual athletes' perceptions in order to obtain a team-level measure of collective efficacy. The limited number of sport teams involved in the present investigation did

not allow this multilevel measurement procedure and, consequently, limited our capacity to analyze the data using multi level modeling. Future studies should include larger number of teams in order to address these issues.

12. Conclusions

The evidence of the present research points to possible practical implications of the findings. The new team instruments have obtained cross-national support, as key measurement characteristics of the instruments held well among team athletes from Italy, Greece and Germany. This finding seems promising for the possibility of extending the use of these instruments to other national or cultural groups. Another possibility is concerned with the contribution that the present research can give to educational programs targeting doping use and to the development of protocols that more explicitly focus on team dynamics.

Acknowledgements

This research was supported by a World Anti-Doping Agency's Social Science Research Grant Program.

Appendix A. Supplementary data

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.psychsport.2016.04.005>.

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Christensen et al., 2004; Lapinski et al., 2007.

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