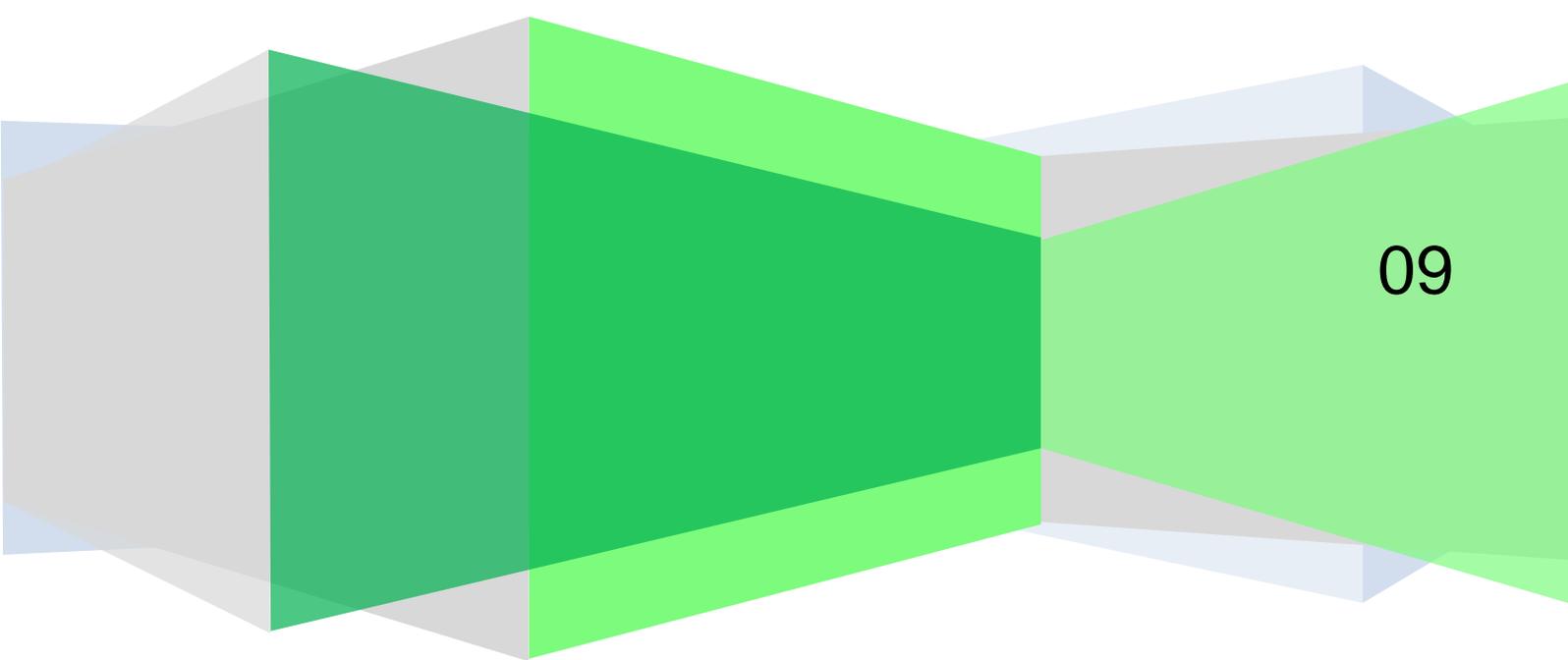


Aristotle University of Thessaloniki
Department of Physical Education & Sports Science

WADA final report

Determinants of Doping Intentions in
Sports (Project DIDIS)

Social Science Research Programme



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Social Science Research Program

FINAL REPORT

Determinants of Doping Intentions in Sport (DIDIS Project)

Thessaloniki, Greece

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1. EXECUTIVE SUMMARY

1.1. Background

Project DIDIS was funded in January 2008 by the World Anti-Doping Agency (WADA) under the programme 'social science research grant'. This project was completed by the Sports and Physical Education Department of the Aristotle University of Thessaloniki, in association with the South-East European Research Centre (SEERC) and the Greek National Council to Combat Doping (NCCD). The duration of the project was 18 months (January 2008 – June 2009).

1.2. Project aims

Project DIDIS aimed to:

- Identify the sportspersonship and motivational profiles of athletes using or intending to use prohibited substances
- Examine the effect of psychosocial variables on athletes' intention to engage in doping, in order to inform subsequent prevention interventions aimed at athletes with risk for doping
- Provide a parsimonious, theory-driven, and integrated model of the psychosocial determinants of prohibited substance use in sports

1.3. Methodology

The methods involved the cross-sectional administration of a battery of psychological measures in a representative sample ($N = 1040$) of elite athletes in Greece (M age = 22.9 years, 37.4% females). The measures included:

- Demographic characteristics (age, gender)
- Achievement goal orientations
- Motivational regulations
- Sportspersonship orientations
- Beliefs about the causes of success in sports
- Attitudes, social norms, and behavioral control beliefs

- Social desirability

1.4. Results

- The results of the cluster analysis revealed three achievement goal groups (mastery and approach oriented and high achievers), three self-determination groups (high and low motivated and amotivated) and two sportpersonship groups (high and low sportpersonship). Mastery oriented and high motivated athletes showed the less intention to engage in doping practices compared to high achievers and amotivated athletes. No significant differences were revealed between the sportpersonship groups.
- Regarding the effect of psychosocial variables on athletes' intention to engage in doping, the regression analyses indicated that introjection and mastery approach goals were negative predictors of intentions, whereas amotivation and performance avoidance goals were positive predictors. In terms of sportpersonship, only social conventions predicted negatively intentions to engage in doping. The TPB variables were found to be significant predictors of intentions.
- The investigation of the integrated model indicated that the effect of distal variables (i.e., achievement goals and motivational regulations) was mediated by the effect of more proximal ones, mainly that of the TPB variables and situational temptation.

1.5. Discussion

The findings of the present study support previous research evidence and theoretical underpinnings on the effect of achievement goals and motivational regulations on planning and executing an unhealthy behavior, such as doping. Furthermore they highlight the important role the TPB variables and situational temptation can play in understanding the mechanisms through which intentions to engage in doping are formulated. Surprisingly, doping was not considered as an unethical behavior and sportpersonship dimensions did not have the expected effect. The findings of the project are discussed in light of current theoretical approaches and on the basis of constructing effective interventions and campaigns to combat doping.

2. INTRODUCTION

2.1. Doping in sports: Detection, punishment, and prevention

The use of prohibited substances and other methods (e.g., blood doping) to increase individual performance and compete against others is not a new issue in sports. Substances that are typically used or abused for performance enhancement reasons include stimulants (e.g., amphetamines), androgenic anabolic steroids or AAS (e.g., testosterone), diuretics, narcotics, and peptide hormones, such as human growth hormone (Jenkins, 2002). The use of performance enhancing drugs (PED) is included under the collective term 'doping', which is officially used to denote illegitimate methods performance enhancement methods.

Public awareness on PED use was raised following the death of a cyclist who abused stimulants in the Tour de France in late 1960s (Dauncey & Hare, 2003). Ever since information campaigns and doping control efforts have increased almost across all competitive sports, and with the active participation of international sports associations and federations. The fight against doping use was strengthened by the formation of the World Anti-Doping Agency (WADA) in 1999. WADA is responsible for monitoring doping use in athletes participating in national and international events, such as the Olympic Games. Most importantly, WADA has made important steps towards globalizing anti-doping efforts by introducing the anti-doping code. In a similar vein, UNESCO's international convention against doping in sports is among the first international frameworks to regulate and set out responsibilities of national governments in relation to the anti-doping struggle (Petroczi, 2007).

Nonetheless, existing efforts to combat doping have largely focused on detection and punishment, rather than prevention of doping use initiation and maintenance (Donovan, Egger, Kapernick, & Mendoza, 2002). As a result, athletes continue to use prohibited substances to influence their performance, and apply several methods to avoid being detected, such as the use of masking drugs. The paucity of research on the etiology of PED use is one of

the most important reasons for lacking effective and evidence-based doping prevention strategies.

Early studies addressed the importance of attitudes and knowledge of professional athletes regarding the health risks involved in the abuse of PED (e.g., Anshel & Russell, 1997), but a recent review by Backhouse, Atkin, McKenna, and Robinson (2007) showed that the majority of studies on doping etiology lack a sound theoretical framework. An exception to that was a study by Petroczi (2007), who investigated the interplay between doping attitudes and achievement orientations, and argued that doping use is complex in nature and the different associations among the several risk factors should be addressed. In fact, Petroczi showed that some variables (achievement orientations) may influence doping behaviors indirectly, through the formation of pro-use attitudes. A different study (Lucidi, Grano, Leone, Lombardo, & Pesce, 2004) examined PED use in adolescent athletes, and found that variables derived from Ajzen's (1991) Theory of Planned Behavior (TPB), and moral disengagement were significant and proximal predictors of PED use intentions and actual behavior. In a similar line of research, Donahue et al. (2006) provided evidence that intrinsic and extrinsic motivation affect the PED use through the effect of sportspersonship orientations. The aforementioned findings highlight at least two important points on the etiology of PED use in sports. Firstly, PED use is a complex phenomenon that can be explained as a function of different variables. These variables, in turn, may be associated with each other in different ways, and such interplay can hardly be grasped by mere attitude and knowledge surveys. Secondly, the complex nature of PED use can be revealed by using theory-driven models to identify proximal and distal predictors. Project DIDIS aimed to investigate the psychosocial processes underlying PED use behavior and intentions in professional athletes by employing an integrated theoretical framework that would help identify both proximal and distal predictors. The conceptual approach and theoretical framework of the project are detailed in the following sections.

2.2. Project DIDIS: Conceptual framework

Being conceptually similar to other forms of maladaptive sport behavior (e.g., cheating), PED use can be adequately explained in terms of psychosocial processes like the formation of salient beliefs towards the use of prohibited substances; appraisal of behavioral control or efficacy over the use of prohibited substances; and the acquisition/internalization of social normative beliefs around the use of prohibited substances in sports. Consideration of social norms relates both to subjective beliefs of acceptability or prevalence of doping, as well as perceptions of doping prevalence among athletes in general, and actual doping use at a team level. While the former concept relates to a social cognitive process, the latter identifies the importance of social contexts wherein doping intentions and behavior are encouraged. Moreover, an athlete's overall inclination to engage in doping can be specified within broader motivational processes like achievement orientation and self-determination. Finally, moral beliefs and behavioral tendencies in sports can serve as the basis for behavioral choices with an ethical or unethical dimension, including the use of prohibited substances to increase performance and compete against others. These constructs can be integrated into a single behavioral model in order to provide a more complete picture of the dynamics of PED use, and identify the potential associations among the different variables. The rationale and background research for the development of such a model is provided as follows.

2.3. Project DIDIS: Theoretical background

Self-Determination Theory

Deci and Ryan's (1985) self-determination theory identifies different facets of motivated behavior in humans. According to their theory, motivation is not a unitary construct, but includes three important dimensions, namely *intrinsic* and *extrinsic* motivation, and *amotivation*. Intrinsic motivation (IM) refers to the engagement in an activity for the pleasure and satisfaction of performing it. Intrinsically-motivated individuals voluntarily participate in an activity without experiencing external or internal pressures to do so and

without expecting rewards (Deci & Ryan, 1985; Deci, Vallerand, Pelletier & Ryan, 1991; Frederick & Ryan, 1995; Vallerand & Bissonnette, 1992; Vallerand, et al., 1992). Vallerand, et al. (1992) supported the notion that IM is a global construct that can be differentiated into three more specific motives, the *intrinsic motivation to know*, to *accomplish*, and to *experience stimulation*.

On the other hand, extrinsic motivation (EM) reflects involvement in activities because of external or internal pressures is considered an extrinsic form of motivation. In such instances, behavior operates as a *means to an end* and not for its own sake (Deci & Ryan, 1985; Deci, et al, 1991; Frederick & Ryan, 1995; Vallerand & Bissonnette, 1992; Vallerand, et al., 1992). Deci and Ryan (1985) view extrinsic motivation as a multidimensional construct, as well. Three types of extrinsic motivation are defined in the SDT tradition: *external regulation*, *introjection*, and *identification* (Deci & Ryan, 2002). The third dimension of motivation identified in SDT is *amotivation*. This dimension refers to the absence of a contingency between one's actions and outcomes. Amotivated individuals do not seem to have specific purposes and goals and they don't seem to approach ends in a systematic fashion, and simply do not demonstrate the intent to engage in an activity.

The distinction of intrinsic and extrinsic motivation led to the idea that different motives may correspond to different levels of self-determined actions. According to their levels of self-determination, these types of motivation are located at various points along a continuum, termed the self-determination continuum. In this continuum the types of intrinsic motivation, (i.e. intrinsic motivation to know, to accomplish and to experience stimulation) represent high levels of self-determination, extrinsic motivation dimensions represent intermediate to low levels of self-determined behavior and amotivation represent the lowest self-determination (Deci & Ryan, 2002).

According to Vallerand (1997, 2007), high self-determined motivation (i.e., intrinsic motivation and identified regulation) tends to result in more adaptive behavioral (e.g., performance, persistence, effort), cognitive (e.g., use of learning strategies, self-handicapping) and affective (e.g., enjoyment, anxiety, emotional experiences) outcomes. In contrast, low self-determined motivation (introjected and external regulation) or amotivation often results in maladaptive outcomes.

Achievement goal theory

Achievement goal theory (AGT) assumes that displaying competence is a fundamental criterion for success in achievement contexts. In the original achievement goal approach two independent goal orientations were identified: task and ego goal orientation (Ames, 1984; Dweck, 1986; Nicholls, 1989). The former reflects engagement in an achievement activity in order to achieve personal development and master the tasks at hand, and the criteria of success are self-referenced. The latter reflects involvement in an activity to demonstrate superior ability compared to others (Nicholls, 1989). In this case the criteria are normative or comparative and outperforming others is defined as success. Several studies have shown that task orientation is related to more adaptive motivational outcomes such as greater effort and persistence (Williams & Gill, 1995), fair play (Smith, Hall & Wilson, 1999; White & Zellner, 1996), greater enjoyment (Duda, Chi, Newton, Walling & Catley, 1995), and lower anxiety (Ommundsen & Pedersen, 1999) (see Duda & Hall, 2001, for a detailed review). By this token, one would expect that the use of prohibited substances to increase performance or compete against others would be less probable in task-oriented athletes, but higher in ego-oriented individuals.

A reformulation of the initial AGT by Elliot and his colleagues (Elliot, 1997; Elliot & Church, 1997; Elliot & Thrash, 2001) resulted into the hierarchical model of approach and avoidance achievement motivation, which identified three goals: mastery goals, performance-approach and performance-avoidance goals. Mastery goals are conceptually similar to task orientation (Barkoukis, Ntoumanis & Nikitaras, 2007) denoting involvement with an activity for self-improvement and mastery. Performance-approach goals, similar to ego orientation (Barkoukis et al., 2007), refer to engagement in an activity to demonstrate superior competence relative to others, while performance-avoidance goals reflect the tendency to avoid showing low competence (Elliot, 1997; Elliot & Church, 1997). Research has shown that mastery and performance-approach goals construe an approach orientation and they are associated with adaptive responses, whereas performance-avoidance goals construe an avoidance orientation, which negatively affects

involvement (Cury, Elliot, Sarrazin, Da Fonseca & Rufo, 2002; Elliot & Harackiewicz, 1996).

Elliot and McGregor (2001) further extended this theoretical framework to take into account both the definition and the valence of achievement goals. The, so called, 2 X 2 achievement goal model incorporates the approach-avoidance distinction to mastery goals, and, thus, includes four achievement goals: mastery-approach, mastery-avoidance, performance-approach, and performance-avoidance goals. The newly introduced mastery-avoidance goals reflect an individual's emphasis on avoiding lack of improvement and task failure. Related research showed that mastery-avoidance goals were associated with negative responses, thus suggesting that these goals construe an avoidance orientation (Cury, Elliot, Da Fonseca & Moller, 2006; Elliot & McGregor, 2001). The 2X2 achievement goal model is the current state in the art, but is a rather underrepresented in the sport psychology literature. Regarding the consequences of adopting a certain achievement goal, Stoeber, Stoll, Pescheck & Otto (2008) showed that approach goals (mastery and performance) were positively associated with striving for perfection whereas both avoidance goals were positively associated with negative reactions to imperfection.

Morality in sports - Sportpersonship

Moral behavior is hard to define, mainly because of the diverse criteria and attributes used by researchers in this area. Within the context of sport behavior morality has been associated – among others – with the concept of sportpersonship, a multifaceted construct that can hardly be described by a single definition. Siedentop, Hastie, and Mars (2004), for instance, suggested that *sportpersonship* refers to understanding and valuing the rules, rituals and traditions of sports and activities, and distinguishing between good and bad practices during those actions. On the other hand, Ommundsen, Roberts, Lemyre, and Treasure (2003) argued that “a sport participant manifests sportpersonship when he or she tries to play well and strive for victory, avoids taking an unfair advantage over the opponent, and reacts graciously following victory and defeat” (p. 398).

In general terms, the interpretation of sportpersonship is based on three theoretical approaches: *social learning theory*, which suggests that reinforcement, modelling or observation, and social comparison play a determinant role for creating young players' perception of appropriate or inappropriate behaviors in the context of sport) (Bandura, 1986, 1977); *structural developmental theory*, according to which behaviors such as sportpersonship, and pro-social choices are related with and correspond to higher levels of moral development (Haan, 1983; Kohlberg, 1984); and the *social-psychological approach* of Vallerand and his colleagues (Vallerand, Briere, Blanchard, & Provencer, 1997; Vallerand & Losier, 1994), which proposes that sportpersonship concerns five dimensions of the behavior in sport: a) full commitment toward sport participation, b) respect for social conventions, c) respect and concern for the rules and officials, c) true respect and concern for the opponent, and e) negative approach toward the practice of sport. This approach can be usefully applied to the study of doping and help identify the role of moral beliefs in PED use. For instance, considering that doping is unfair means to achieve success, one would expect that athletes using prohibited PEDs will not display respect and concern for opponents or rules.

Theory of Planned Behavior

Ajzen's (1991) TPB is a general model of attitude-behavior relationships, but has been widely applied in the study of several risk behaviors, including smoking, illicit drug and alcohol abuse, unsafe sex, and driving without wearing seat belts (for reviews see Armitage & Conner 2000; 2001; Conner & Armitage, 1998). Most importantly, among the handful of studies that have used a theoretical framework to investigate the etiology of doping, TPB has been the theoretical model of choice (e.g., Lucidi et al., 2004; Petroczi, 2007; Wiefferink, Detmar, Coumans, Vogels, & Paulussen, 2008). The popularity of the TPB mainly lies in its parsimony and research evidence showing that the main constructs of the theory can predict up to 60% of behavioral intentions, and 50% of behavior – a major achievement compared to other models of behavior (Armitage & Conner, 2000; 2001). These constructs include *attitudes* (evaluative judgments of a given behavior), *subjective norms* (perceived

social acceptance of a given behavior), and perceived behavior control or PBC, which is defined as the subjective estimate of control over the behavior in question. These variables are assumed to predict intentions, which in turn, predict behavior – although PBC may as well predict behavior directly, without the necessary mediation of intentions (Ajzen, 1991; 2002; Armitage & Conner, 2001). Finally, an important aspect of the TPB is that it recognizes intentions as the immediate antecedents of behavior. In fact, within the substance use literature intentions are used to classify high risk individuals (e.g., Choi, Gilpin, Farkas, & Pierce, 2001; Choi, Pierce, Gilpin, Farkas, & Berry, 1997; Pierce, Choi, Gilpin, Farkas, & Merritt, 1996).

Reviews and meta-analyses have suggested that the TPB can be expanded, in order to provide better and more accurate estimates of intentional behavior (e.g., Conner & Armitage, 1998; Ravis & Sheeran, 2003). The variables proposed as potential additions in the main corpus of the theory include past behavior, descriptive norms, and different concepts of behavioral control (Armitage & Conner, 2001). More specifically, past behavior is said to be one of the strongest predictor of future actions (e.g., Choi et al., 2001; Conner & Armitage, 1998; Sutton, 1998), and it is worth exploring which other variables can validly predict intentions and behavior. Furthermore, descriptive norms have been proposed as additional measures of normative influence that differ conceptually and functionally from the standard subjective norm measures applied by the TPB. Unlike subjective norms (perceptions of what someone *should be* doing), descriptive norms reflect perceived prevalence or popularity of the target behavior (what most people *typically do*). Finally, Armitage and Conner (2001) argued that the effects of PBC on intentions and behavior can be improved by the consideration of alternative measures of this construct. One such measure is situational temptation, which is used to describe people's eagerness to endorse a given behavior under specific circumstances.

Integrated theoretical model

Motivational variables are thought to influence sportsmanship and beliefs about success in sports. Duda, Olson, and Templin (1991) argued that ego-oriented individuals are likely to demonstrate a maladaptive pattern of

sportsmanship orientation. That is, athletes with an ego orientation are inclined to endorse any necessary action to obtain victory and display superiority. On the other hand, task-oriented athletes show a more adaptive profile of sportsmanship. A similar pattern has been empirically supported regarding the relationship between goal orientation and perceptions of legitimacy of aggressive acts. Specifically, compared to task-oriented athletes, ego-oriented ones were more likely to accept the legitimacy of intentionally injurious acts against their opponents (Duda et. al., 1991).

Furthermore, Vallerand and Losier (1999) proposed that intrinsically motivated athletes are more likely to show respect to their social surroundings, than to cheat on a game. In contrast, extrinsically motivated individuals compete for external rewards (trophies, financial rewards, publicity etc.) and show a clear tendency to outperform others in order to win. In addition, Donahue et al. (2006) suggested that sportpersonship orientations mediated the effect of intrinsic and extrinsic motivation on the use of prohibited substances in sports. Intrinsically motivated athletes were characterized by high sportpersonship and this led to lower use of prohibited substances. Also, Hagger, Chatzisarantis, and Biddle (2002) provided empirical support for the effect of intrinsic motivation on the Theory of Planned Behavior (TPB; Ajzen, 1991), and found that, in accordance with the assumptions of the TPB, attitudes and perceived behavioral control mediated the effect of intrinsic motivation on behavioral intention and physical activity.

On the whole, the aforementioned findings suggest that goal orientations and motivational regulations affect the formation of sportsmanship profile, and that TPB variables mediate the influence of these motivational tendencies on intentions to perform behavior, and on actual enactment of the behavior in question. This approach defines the theoretical framework of Project DIDIS, which is graphically presented in Figure 1. This model helps identify distal and proximal predictors of PED use intentions, as well as potential causal associations among these predictors.

2.4. Research questions and hypotheses

Based on the research findings and theoretical assumptions described in the previous section, the following hypotheses (Hs) were formed:

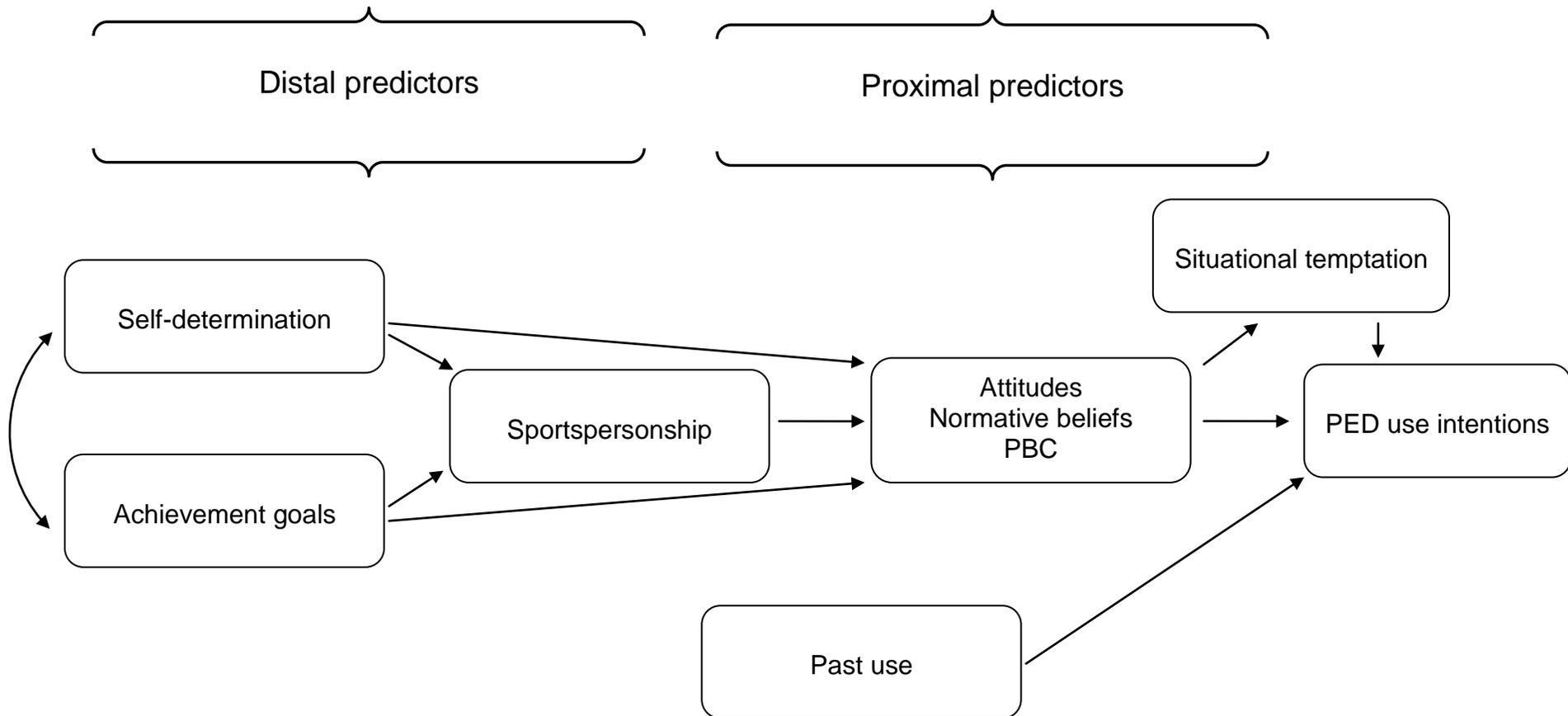
H1: Athletes demonstrating maladaptive motivational and sportpersonship profiles (high ego orientation, high extrinsic motivation, low sportpersonship), will report higher scores in prohibited PED use and stronger pro-use intentions.

H2: Motivational regulations and achievement goal orientations will predict PED use intentions through sportpersonship, attitudinal, normative, and behavioral control beliefs.

H3: Sportpersonship will predict PED use intentions through normative, attitudinal, and behavioral control beliefs.

Figure 1.

An integrated behavioral model of PED use intentions: The effects of distal predictors are mediated by proximal predictors



3. METHOD

3.1. Participants

Anonymous questionnaires were given to Greek elite-level athletes from nine different sports (football, basketball, volleyball, handball, athletics, swimming, shooting, Tae Kwon Do, and rowing). Participants were randomly selected from the five largest Greek cities, and criteria for participation included systematic participation in trainings and involvement of athletes with their sport for the past 5 years, as well as a record on national and/or international athletic events. Overall, 2000 athletes were approached and 1075 agreed to participate in the study (response rate = 53.7%); yet 35 surveys were excluded from the analysis because of missing data and non-completion of main parts, leaving a final sample of 1040 surveys. The final sample consisted of athletes from both team (51.1% or $n = 532$), and individual sports (48.9% or $n = 508$). The distribution of participants to each sport is presented in Table 1. Mean age was 22.9 years ($SD = 6.39$), and 37.4% of the participants were females. All participants were informed about the purposes of the study and were told that their participation was voluntary, with no foreseeable penalties for withdrawing from the study at any point. Ethics approval for the data collection methods and procedures of the study was granted by the respective authority of the Research Committee of the Aristotle University of Thessaloniki.

Table 1.

Distribution of participating athletes in each sport (N = 1040)

	<i>N</i>	<i>%</i>
Soccer	79	7.6
Basketball	156	15
Volleyball	148	14.2
Handball	148	14.2
Rowing	137	13.2
Athletics	128	12.3
Swimming	96	9.2
Tae Kwon Do	90	8.7
Archery	58	5.6

3.2. Measures

Social desirability

Given the prohibited nature of doping substances some athletes may be reluctant to report either their intentions to engage in doping or their actual behavior, and consequently provide socially desirable responses. To identify such reporting bias the social desirability scale was used to measure the tendency to respond in socially desirable ways (e.g., reporting *not* using drugs, when in fact one is a user). A short 10-item version of the Marlowe-Crowne Social Desirability Scale (SDS) developed by Strahan and Gerbasi (1972) was used for the purposes of the present study. Responses were given on a true/false format.

Achievement goals

The measurement of the four achievement goals described by the hierarchical 2X2 model was done via the Approach and Avoidance Achievement Goal Questionnaire (AAAGQ; Conroy, Elliot, & Hofer, 2003) developed for sports. The original 12-item questionnaire was designed to measure achievement goals in the general undergraduate classroom context (Elliot & McGregor, 2001). Conroy et al. (2003) developed a modified for sport version of the

scale. The scale assesses mastery-approach, mastery-avoidance, performance-approach and performance-avoidance goals (three items for each subscale). Responses are given on a 7-point scales ranging from 1 (not at all like me) to 7 (completely like me).

Motivational regulations

The Sport Motivation Scale (SMS; Pelletier, Fortier, Vallerand, Tuson, & Briere, 1995) was used to measure the motivational regulations proposed by the self-determination theory. This scale assesses athlete's motivation for engaging in sports activities. It assesses 7 types of motivational regulation: intrinsic motivation toward knowledge, accomplishment and stimulation, as well as external, introjected and identified regulations, and amotivation. It contains 28 items (4 items for each of the 7 sub-scales). Responses are given on a 7-point scale ranging from 1 (doesn't correspond at all) to 7 (corresponds exactly). In order to further examine the global impact of self-determination on intentions in subsequent analysis, the Relative Autonomy Index (RAI) was calculated based on the equation: $[2 \times \text{intrinsic motivation}] + \text{identification} - \text{introjection} - [2 \times \text{external regulation}]$. According to Deci and Ryan's (2002) recommendations, the 'amotivation' subscale is not used in the equation of RAI.

Sportspersonship orientations

Sportspersonship orientation was measured with the Multidimensional Sportspersonship Orientation Scale (MSOS; Vallerand, et al., 1997). The MSOS assesses the sportsmanship orientations proposed by self-determination theory. The scale assesses five different types of sportspersonship orientations, that is, concern and respect for the opponent, for rules and officials, for one's engagement in sport, for social conventions, and a negative orientation towards sport participation. It contains 25 items (5 items per subscale). Responses are coded on a 5-point scale ranging from 1 (doesn't correspond to me at all) to 5 (corresponds to me exactly). Consistent with previous literature (Lemyre, Roberts & Ommundsen, 2002) the negative orientation towards sport participation subscale showed low internal consistency scores and, thus, was excluded from further analyses. All the

remaining subscales reflect a positive orientation. Therefore, a composite score (termed 'moral') was used during the investigation of the integrated theoretical approach. Higher scores in the composite 'moral' measure reflect high sportspersonship, whereas lower scores reflect low sportspersonship.

The Beliefs about the Causes of Sport Success Questionnaire (BACSSQ; Duda & Nicholls, 1992) was used to assess athletes' perceptions about the causes of success. The measure consists of 18 items relevant both to malpractice (e.g., people succeed in sports if they know how to cheat) and good practice in sports (e.g., people succeed in sports if they always do their best). Responses are measured on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Theory of planned behavior

The variables of the theory of planned behavior (attitudes, subjective norm, perceived behavioral control and intention) was measured based on the guidelines reported by Ajzen (2003). Three items measured behavioral intentions (e.g., "I intend to use prohibited substances to enhance my performance during this season") on 7-point Likert-type scales anchored by "strongly agree" (7) to "strongly disagree" (1).

Attitudes were assessed in response to the following question: "The use of prohibited substances to enhance my performance during this season is..." Responses were measured on four 7-point semantic differential scales with the following bipolar adjectives: *bad-good*, *harmful-beneficial*, *ethical-unethical*, and *useful-useless*.

Subjective norms were measured by four items (e.g. "Most people I know/ my coach/other athletes in my team: would *approve* of me using prohibited substances to enhance my performance during this season") on 7-point Likert-type scales from 1 (negative pole) to (7) (positive pole). Descriptive norms were assessed by the following items "Out of 100%, how many athletes at your competitive level, do you believe engage in doping to enhance their performance?", "Out of 100%, how many elite athletes in Greece do you think engage in doping to enhance their performance?", and "Out of 100%, how many elite athletes do you believe will be engaged in doping during the next 5 years to enhance their performance?" These items

were open-ended, and respondents will indicate their estimates by marking a percentage from 0 to 100%. A similar item on doping prevalence at the team level (i.e., “out of 10, how many athletes in your team use doping substances”) was employed. This item was compared with self-reports of doping use to examine whether perceived prevalence of doping in a general and a team level is a misperception of actual prevalence. Also, teams with high levels of reported doping were indicative of normative contexts (i.e., contexts wherein doping is encouraged/accepted).

Perceived behavioral control (PBC) was assessed through three items (e.g. “I feel in complete control over whether I will use illegal substances to enhance my performance during this season”) measured on 7-point Likert-type scales ranging from (1) “no control” to (7) “complete control”. An additional measure of behavioral control, namely situational temptation, was employed to capture efficacy to resist doping in certain situations (e.g., ‘when my coach advises me to use doping’; ‘when I believe my colleagues use doping substances’). This measure consisted of four items scored on a five-point Likert scale (1 = not at all tempted, 5 = very much tempted).

Past PED use was assessed with the question ‘have you ever used prohibited substances to enhance your performance?’ Four response options were given (1 = no, I have never used prohibited substances; 2 = yes, I once used prohibited substances to enhance my performance, but not ever since; 3 = yes, I occasionally use prohibited substances to enhance my performance; and 4 = yes, I systematically use prohibited substances to enhance my performance). For purposes of subsequent statistical analysis these responses were categorized as: ‘Never users’ including those who said they never used prohibited substances, and ‘ever users’ including those who reported past use of performance-enhancing prohibited substances.

3.3. Procedure

Sports clubs were contacted and the aim of the project was described to the administrative board and the coaches. Following the permission of administrative board and coaches, athletes were briefed about the project, and informed consent was requested from those wishing to participate. Because major doping scandals involving Olympic athletes in erupted during

data collection, we were concerned about participants' reluctance to participate in the study. In order to overcome this issue, we decided to administer some of the questionnaires through coaches and sport club managers to ensure confidentiality. Both oral and written instructions were given to participants regarding the completion of the questionnaire, and the athletes were reminded about voluntary participation, anonymity, and confidentiality of their responses, and encouraged to ask any questions regarding the understanding/comprehension of the questionnaire items. Questionnaires were completed anonymously and in isolation. Athletes returned the completed questionnaires into a sealed envelope.

4. RESULTS

4.1. Descriptive statistics

Means, standard deviations and internal consistency scores of the measures used in the study are presented in Table 2. The intercorrelations among the study variables are presented in Table 3.

Table 2.

Means, standard deviations and internal consistency scores (N = 1040)

	<i>Mean</i>	<i>SD</i>	<i>Cronbach's α</i>
Doping Intentions	1.54	1.43	.97
Achievement goals			
<i>Mastery-approach</i>	6.30	.78	.70
<i>Mastery-avoidance</i>	5.09	1.41	.85
<i>Performance-approach</i>	5.01	1.38	.72
<i>Performance-avoidance</i>	4.11	1.64	.78
Motivational regulations			
<i>IM to know</i>	5.33	1.19	.85
<i>IM to accomplish</i>	5.49	1.09	.82
<i>IM stimulation</i>	5.60	.94	.70
<i>Identification</i>	4.70	1.09	.65
<i>Introjection</i>	5.14	1.17	.71
<i>External regulation</i>	3.61	1.33	.73
<i>Amotivation</i>	2.28	1.14	.67
Sportspersonship			
<i>Social conventions</i>	5.91	1.04	.86
<i>Rules and officials</i>	5.75	.96	.80
<i>Commitment</i>	6.19	.85	.81
<i>Opponent</i>	5.07	1.10	.72
<i>Negative approach</i>	3.55	1.02	.51
Beliefs about causes of success			

	<i>Effort</i>	4.37	.60	.87
	<i>Ability</i>	3.99	.62	.65
	<i>External factors</i>	2.79	.71	.66
TPB				
	<i>Attitudes</i>	1.66	1.17	.78
	<i>Subjective norm</i>	1.43	1.04	.84
	<i>Descriptive norm</i>	53.5	31.25	-
	<i>PBC</i>	5.95	1.75	.76
	<i>Temptation</i>	1.74	.97	.84

Table 3.

Intercorrelations among the study variables (N = 1040)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1. Doping Intentions	-																							
2. Mastery-approach	-.12	-																						
3. Mastery-avoidance	.07	.21	-																					
4. Performance-approach	.13	.26	.28	-																				
5. Performance-avoidance	.18	.05	.25	.61	-																			
6. IM to know	.01	.42	.12	.17	.14	-																		
7. IM to accomplish	.00	.46	.18	.23	.17	.79	-																	
8. IM stimulation	-.04	.47	.18	.23	.17	.56	.65	-																
9. Identification	-.05	.23	.08	.23	.21	.40	.49	.48	-															
10. Introjection	-.10	.29	.09	.19	.15	.43	.50	.49	.47	-														
11. External regulation	.02	.01	.02	.39	.29	.16	.26	.24	.50	.39	-													
12. Amotivation	.23	-.30	.08	-.07	.05	-.28	-.30	-.34	-.11	-.15	.07	-												
13. Social conventions	-.17	.42	.10	.01	-.08	.19	.23	.21	.09	.15	-.09	-.21	-											
14. Rules and officials	-.10	.48	.14	.02	-.01	.35	.34	.31	.17	.22	-.07	-.25	.64	-										
15. Commitment	-.11	.68	.18	.15	.04	.40	.45	.51	.19	.32	-.05	-.34	.47	.61	-									
16. Opponent	-.12	.25	.10	-.06	-.07	.25	.26	.19	.17	.22	.01	-.09	.52	.53	.32	-								
17. Negative approach	.01	-.14	.14	.23	.22	-.15	-.11	.00	.01	.04	.22	.22	-.23	-.31	-.24	-.18	-							
18. Effort	-.16	.51	.19	.19	.07	.43	.44	.37	.20	.32	.07	-.22	.34	.40	.48	.37	-.09	-						
19. Ability	-.05	.27	.17	.39	.23	.21	.31	.32	.19	.25	.29	-.15	.10	.17	.27	.17	.10	.51	-					
20. External factors	.20	-.07	.09	.31	.30	.12	.12	.10	.18	.10	.33	.13	-.17	-.07	-.07	-.03	.27	.01	.31	-				
21. Attitudes	.59	-.20	.01	.04	.07	-.11	-.09	-.12	-.05	-.11	.11	.24	-.24	-.23	-.21	-.15	.14	-.13	.00	.14	-			
22. Subjective norm	.48	-.20	.00	.03	.08	-.10	-.09	-.17	-.07	-.07	.02	.27	-.22	-.25	-.22	-.17	.19	-.17	-.07	.15	.44	-		
23. PBC	-.24	.27	.08	-.03	-.02	.05	.07	.14	.00	.08	-.08	-.13	.21	.19	.26	.05	-.01	.14	.11	.11	-.18	-.11	-	
24. Descriptive norm	.24	.10	.10	.11	.13	.05	.07	.05	.07	.04	.00	.10	-.01	.00	.07	-.01	.03	.05	.01	.08	.16	.16	.06	
25. Temptation	.72	-.08	-.08	.12	.20	.03	.01	-.04	-.02	-.02	.07	.25	-.18	-.14	-.14	-.08	.10	.10	.00	.23	.53	.53	-.20	

Note. PBC = perceived behavioral control, values above .07 are statistical significant at $p < .05$.

The results of the descriptive analyses indicated that 8.2% of the participating athletes reported past use of prohibited PED. Specifically, 3.7% reported PED use only once in the past, 3% said they used prohibited PED occasionally, whereas 1.5% reported systematic use of prohibited substances (Figure 2).



Figure 2. Percentage of athletes having occasionally or systematically used prohibited substances

In addition, the results of descriptive analyses indicated that only a small percentage of athletes reported high intentions to use prohibited substances in the future (Figure 3, Figure 4 and Figure 5).





Figure 3. Intention to use prohibited substances





Figure 4. Belief to use prohibited substances



Figure 5. Determination to use prohibited substances

4.2. Social desirability: In search for confounding effects

Partial correlation analysis was used to examine whether social desirability acted as a confounder (also termed nuisance variable), by inflating the correlations between PED use intentions, motivation, achievement goals, moral beliefs, and variables derived from the TPB. For this reason, the variance reduction rate (VRR) was calculated using the equation: $(\text{zero-order correlation})^2 - (\text{partial correlation})^2 / (\text{zero-order correlation})^2$, and only the significant correlations between PED use intentions and the aforementioned variables were examined. The findings indicated that, overall, the sizes of the correlations (all zero-order r s ranged from to .067 to .740) did not change significantly after controlling for social desirability (following partial correlation all r s ranged from .053 to .732). The VRR analysis indicated that social desirability potentially acted as a confounder (with VRRs ranging from 24.2%

to 75.4%) in associations of PED use intentions with sportspersonship beliefs, beliefs about the causes of success in sports, and some dimensions of achievement goals (i.e., mastery and performance approach) – with the largest nuisance effects being observed in the correlations between sportspersonship beliefs and PED use intentions. Social desirability had a minimal impact on associations between PED use intentions and motivational and TPB variables. The results of the VRR analysis are shown in Table 4.

Table 4.

VRR analysis on the effect of social desirability

	Doping Intentions		
	Zero-order correlation	Partial correlation [†]	VRR
<i>Achievement goals</i>			
Mastery-approach	-.119	-.094	37.6%
Mastery-avoidance	.067	.070	8.3%
Performance-approach	.146	.126	25.5%
Performance-avoidance	.205	.186	17.6%
<i>Motivational regulations</i>			
Introjection	-.103	-.097	11.3%
Amotivation	.239	.227	9.7%
<i>Sportspersonship</i>			
Social conventions	-.180	-.135	43.7%
Commitment	-.110	-.065	65%
Rules and officials	-.107	-.053	75.4%
Opponent	-.128	-.082	58.9%
<i>Beliefs about the causes of success</i>			
Effort	-.164	-.140	27.1%
External factors	.208	.181	24.2%
<i>Theory of Planned Behavior</i>			
Attitudes	.615	.605	1.2%

Subjective norm	.492	.479	5.2%
PBC	-.262	-.251	8.2%
Descriptive norm	.256	.246	7.6%
Temptation	.740	.732	0.3%

Note. Statistical significant correlations ($p < .05$) are presented. † Partial correlation after controlling for social desirability, VRR = Variance Reduction Rate, PBC = Perceived Behavioral Control.

4.3. Cluster analysis: Identifying pro-PED use sportspersonship and motivational profiles

Cluster analyses and analyses of variance (ANOVAs) were employed to examine the first hypothesis of the study: whether athletes with maladaptive motivational and sportspersonship profiles have higher scores in self-reported past use of banned PED, and stronger pro-use intentions.

Cluster analysis: Identifying self-determination and sportspersonship groups

A cluster analysis using the seven self-determination sub-scales was employed to classify athletes into different motivational profile groups. The Ward method using K-means clustering was used. The analysis indicated that a three-group solution was the most meaningful. This was supported by subsequent ANOVA and post-hoc analysis. The three profile groups were defined as “Highly Motivated”, “Amotivated”, and “Low Motivated” athletes.

“Highly Motivated” athletes ($n = 452$) had the highest mean scores of the three groups in all dimensions, except amotivation. These athletes enjoy participating in competitive sports but, as professionals, they also strive for rewards. “Amotivated” athletes ($n = 188$) had the lowest scores in all intrinsic dimensions and moderate scores in all extrinsic motivation dimensions, but also the highest score in the amotivation dimension. These athletes have lost interest in sport participation. Finally, the “Low Motivated” group ($n = 395$) reported moderate mean scores in all the intrinsic motivation dimensions, and comparably low scores in amotivation. These athletes can be considered as not having much intrinsic motivation to participate in sports, and obtaining rewards does not seem to be among their top priorities in sports. An ANOVA

indicated statistically significant differences among all the seven cluster groups.

The same procedure was used to classify athletes into achievement goal sub-groups. The analysis indicated that a three-group solution was the most meaningful. This was supported by the ANOVA and subsequent post-hoc analysis. The three segments were defined as “Mastery Oriented”, “Approach Oriented”, and “High Achievers” athletes. “Mastery Oriented” athletes ($n = 299$) had high mean scores in mastery goals (approach and avoidance) but low in performance goals (approach and avoidance). This group represents the athletes that focus on the definition of competence. These athletes define success and competence using self-referenced criteria and focus on their personal improvement and development. “Approach Oriented” athletes ($n = 280$) had high scores in approach achievement goals (mastery and performance) and low in avoidance goals (mastery and performance). This group reflects the athletes focusing on the valence of competence. These athletes strive for positive outcomes seeking either to improve or outperform others. Finally, the “High Achievers” group ($n = 452$) showed high mean scores in all the achievement goal dimensions. These athletes can be considered as adopting multiple, even conceptually different, goals. An ANOVA including social desirability as a covariate indicated statistically significant differences among all the four cluster groups.

Finally, the same analyses were used to identify sportpersonship profiles. The findings showed that a two-group solution was the most meaningful. This was supported by the ANOVA and subsequent post-hoc analysis. The two groups were defined as “Low Sportpersonship” and “High Sportpersonship”. Athletes in the “High Sportpersonship” group ($n = 777$) had the highest mean scores in all dimensions, and displayed high respect to several aspects of sport participation. The “Low Sportpersonship” athletes ($n = 256$) had lower mean scores in all the sportpersonship dimensions, reported less morality during sport participation. An ANOVA indicated statistically significant differences between the cluster groups.

Effects of motivational and sportpersonship profiles on self-reported past use and intentions

Three different ANOVAs, including social desirability as a covariate variable, were conducted to respectively examine whether self-determination (i.e., highly motivated, amotivated, and low motivated), achievement goal (i.e., mastery oriented, approach oriented, and high achievers), and sportpersonship groups (i.e., high/low sportpersonship) differed in self-reported past PED use and pro-use intentions.

The findings indicated that athletes with different self-determination profiles also differed in their pro-use intentions ($F = 4.81, p < .001$), but not in self-reported past use of prohibited substances. Specifically, athletes in the amotivated group reported stronger intentions, compared to athletes in the highly motivated group. Furthermore, the findings showed that athletes in the mastery-oriented group reported both lower past use ($F = 5.31, p < .001$) and intention ($F = 16.90, p < .001$) scores. Finally, athletes with different sportpersonship profiles did not differ significantly in self-reported past use and intentions to use prohibited substances. In all three analyses, social desirability had a significant main effect, thus suggesting that motivational and sportpersonship perceptions related to doping may be affected by social desirability. These findings provide further support to the VRR analysis.

4.4. Effects of achievement goals, self-determination, and sportpersonship on PED use intentions

In order to assess the unique predictive effects of self-determination, achievement goals, and sportpersonship (sportpersonship orientations and beliefs about the causes of success) dimensions on PED use intentions, four separate hierarchical linear regressions analyses were performed. Taking into consideration the different theoretical approaches adopted in the present study, all these variables should have significant unique effects on PED use intentions. Therefore, the analyses reported in this section were performed to investigate this effect and, more specifically, reveal the unique contribution of the several dimensions of motivational regulations, achievement goals, and sportpersonship orientations to predict PED use intentions. Furthermore,

based on the findings from the VRR analysis, we statistically controlled for the effects of social desirability in each regression. Specifically, in each analysis, social desirability was entered at the first step, whereas the remaining predictor variables were entered at the second step.

Self-determination

Two of the self-determination variables significantly predicted PED use intentions ($F(8, 1018) = 14.03$, $AdjR^2 = 9.3\%$, $p < .001$). More specifically, introjection had a negative effect ($\beta = -.140$, $p < .001$) whereas amotivation a positive one ($\beta = .254$, $p < .001$). The effect of social desirability was negative and statistically significant ($\beta = -.139$, $p < .001$). (Figure 6).

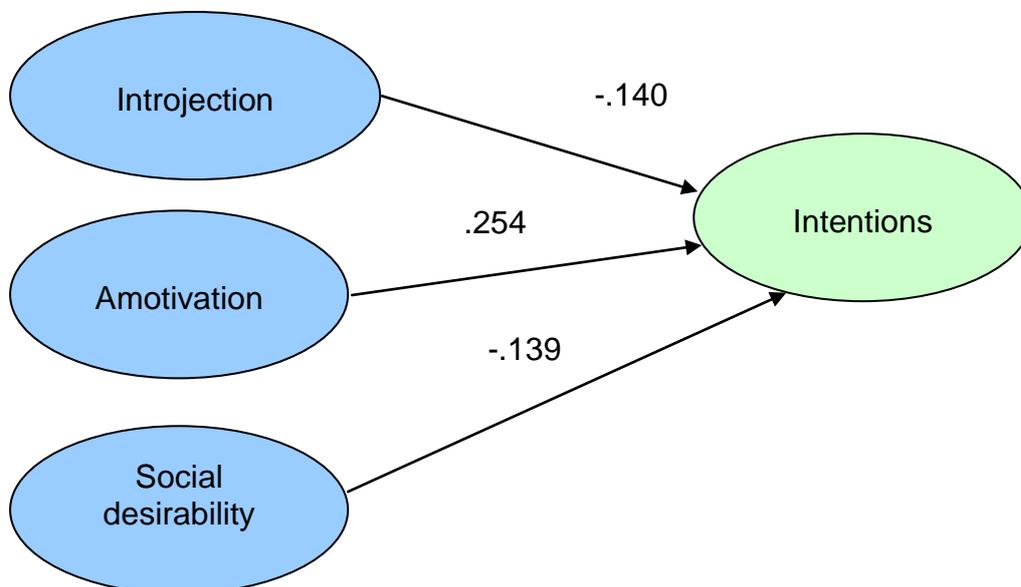


Figure 6. Effects of self-determination variables on doping intentions

Achievement goals

Achievement goals significantly predicted doping intentions ($F(5, 1016) = 15.42$, $\text{Adj}R^2 = 6.6\%$, $p < .001$), over and above the effect of social desirability (social desirability, $\beta = -.114$, $p < .001$). Mastery-approach goals negatively predicted ($\beta = -.134$, $p < .001$) doping intentions, whereas performance-avoidance had a positive effect ($\beta = .127$, $p = .001$) (Figure 7).

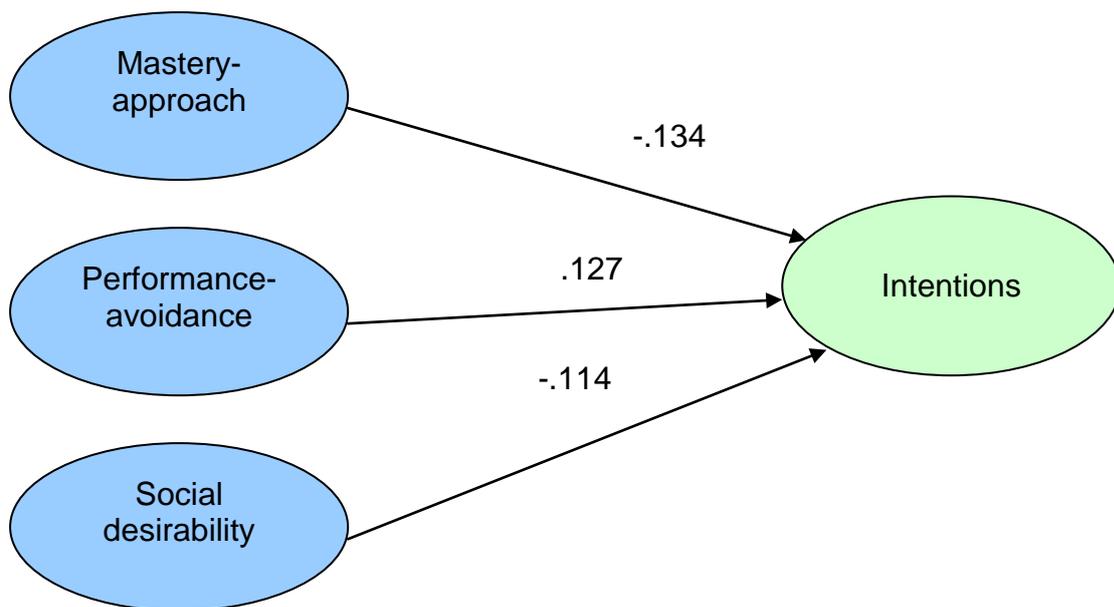


Figure 7. Effect of achievement goals on doping intentions

Sportspersonship orientations and beliefs about the causes of success

Interestingly, regarding the effects of sportspersonship beliefs, only the dimension of social conventions was a significant predictor of doping intentions ($\beta = -.132, p = .002$). Social desirability also predicted intentions ($\beta = -.125, p < .001$).

With respect to beliefs about the causes of success in sports, the results showed that two dimensions significantly predicted doping intentions ($F(4, 1006) = 21.45, \text{Adj}R^2 = 7.5\%, p < .001$). In particular, 'effort' was a negative predictor of doping intentions ($\beta = -.117, p = .001$), whereas the dimension of 'external factors' had a positive effect ($\beta = .203, p < .001$). Social desirability also retained a significant predictive effect ($\beta = -.101, p = .001$). The findings are schematically presented in Figure 8.

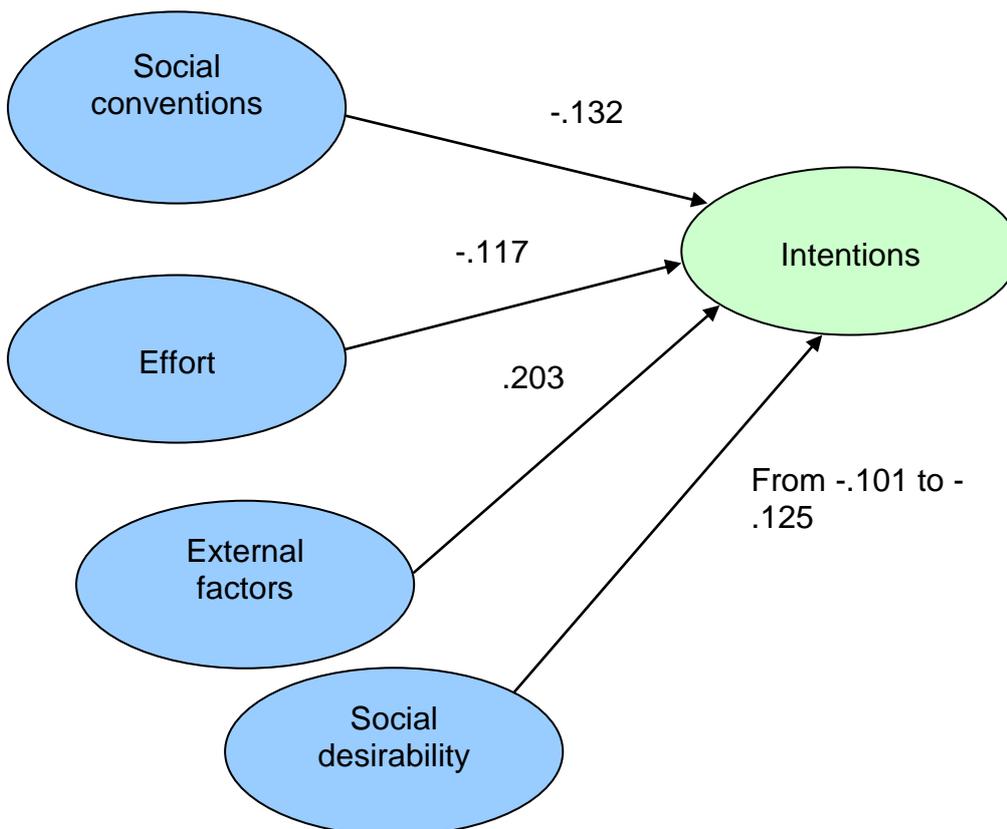


Figure 8. Effect of sportspersonship orientations and beliefs about the causes of success on doping intentions

4.5. The Theory of Planned Behavior and PED use intentions

A hierarchical linear regression analysis with four steps was conducted to assess the predictive effects of social desirability and the variables derived from the TPB. Social desirability was entered at the first step, while in the second step the core planned behavior theory variables (i.e., attitudes, perceived behavioral control and subjective norm) were entered. Because we extended the traditional TPB model to include descriptive norms and situational temptations, these two variables were entered at steps three and four respectively, so as to assess their unique effects on top of social desirability and core TPB variables. The results showed that the overall model had a large multivariate effect size, predicting up to 60% ($AdjR^2$) of PED use intentions.

More specifically, social desirability was a significant and negative predictor of doping intentions at step one ($\beta = -.155, p < .001, AdjR^2 = 2.3\%$). At the second step, the standard TPB variables were included and significantly increased predicted variance by 41.8% ($\beta_{attitudes} = .456, p < .001, \beta_{subjective\ norm} = .262, p < .001, \beta_{PBC} = -.141, p < .001$), while turning the effects of social desirability non-significant. Adding descriptive norm at the third step significantly increased predicted variance by 1.6% ($\beta_{descriptive\ norm} = .130, p < .001$). Finally, situational temptation was entered at the last step of the analysis, and increased predicted variance by 14.6%. Situational temptation was the strongest predictor of PED use intentions ($\beta_{temptation} = .511, p < .001$), and mediator of the effects of subjective and descriptive norm on intentions (Figure 9).

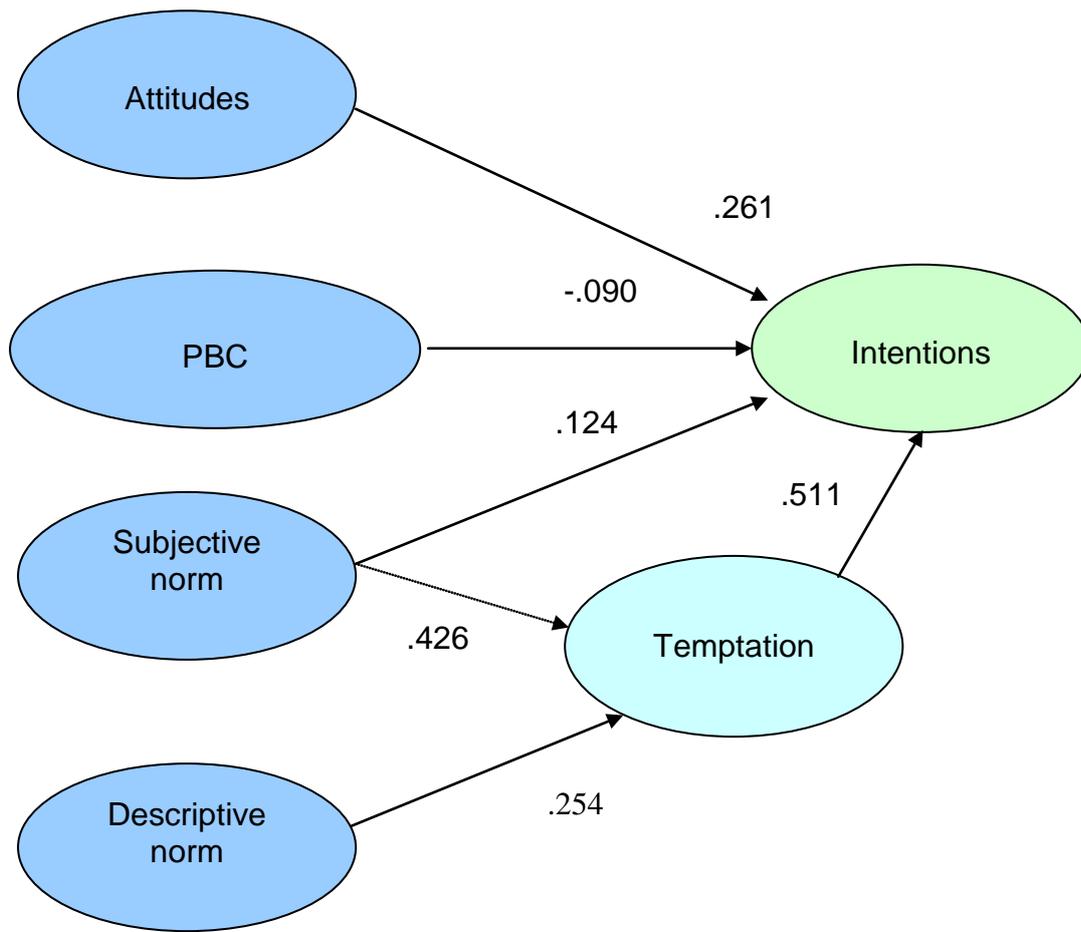


Figure 9. Effects of TPB variables, descriptive norm and temptation on doping intentions¹

4.6. Theory integration

A hierarchical regression analysis in six steps was conducted to examine the second and third hypotheses of the study. Specifically, we assessed the effects of distal predictors (e.g., achievement goals and self-determination) of PED use intentions, while controlling for the effects of proximal predictors (e.g., TPB variables), social desirability, and self-reported past use. Because in the proposed theoretical model we are interested in the overall self-determination and sportpersonship orientations of athletes, in this analysis we examined separately RAI and amotivation as indicators of self-determination, and ‘moral’ as an indicator of sportpersonship.

¹ The indirect effects of subjective and descriptive norms on intentions are also presented. The beta weights for the indirect effects are derived from multiple mediation analysis, which is not presented in this report.

Overall, the model significantly predicted PED use intentions ($F(14, 952) = 129.89, p < .001$) and explained 65.5% ($AdjR^2$) of the variance. Social desirability was included at step one, and significantly predicted PED use intentions. Achievement goals (mastery approach/avoidance, performance approach/avoidance) and self-determination (RAI and amotivation) were added at the second step and significantly increased predicted variance by 9.4%, and all variables but mastery avoidance had significant effects. Moral behavior was added at the third step of the analysis and yielded a non-significant increase in predicted variance. The TPB variables (attitudes, subjective and descriptive norms, PBC) were added at the next step, assuming that they are more proximal predictors of intentions. Indeed, these variables increased variance in intentions by 36.5%, which is a large effect size. Most importantly, the addition of TPB variables in the model turned the effects of some of the other predictors (e.g., social desirability, mastery approach) non-significant, thus suggesting a potential mediation effect. Situational temptation was entered at the fifth step last step, and significantly increased the predicted variance by 13.2%. Situational temptation also mediated the effect of several variables (i.e., descriptive norm, amotivation, and performance avoidance) and had the strongest predictive effect on PED use intentions ($\beta = .500$), compared to the other predictors in the model. Past use of prohibited substances was added at the final step of the analysis, and explained an additional 4.1% in PED use intentions. The results of the analysis are presented in Table 5.

Table 5.

Predictors of intentions for doping in sport (N = 953)

Step	Predictors	β	AdjR ²
1	Social desirability	-.158*	.024
2	Social desirability	-.097*	.113
	Mastery approach	-.119*	
	Mastery avoidance	.008	
	Performance approach	.124*	
	Performance avoidance	.108*	
	RAI	.127*	
	Amotivation	.227*	
3	Social desirability	-.079*	.114
	Mastery approach	-.094*	
	Mastery avoidance	.013	
	Performance approach	.121*	
	Performance avoidance	.107*	
	RAI	.131*	
	Amotivation	.221*	
	Moral	-.060	
4	Social desirability	-.036	.480
	Mastery approach	-.020	
	Mastery avoidance	-.003	
	Performance approach	.070*	
	Performance avoidance	.078*	
	RAI	.124*	
	Amotivation	.073*	
	Moral behavior	.059	
	Attitudes	.448*	
	Subjective Norm	.241*	
	Descriptive Norm	.101*	
	PBC	-.151*	
5	Social desirability	.047*	.613
	Mastery approach	-.063*	

	Mastery avoidance	.004	
	Performance approach	.089*	
	Performance avoidance	.011	
	RAI	.106*	
	Amotivation	.035	
	Moral behavior	.023	
	Attitudes	.266*	
	Subjective Norm	.121*	
	Descriptive Norm	.004	
	PBC	-.080*	
	Situational temptation	.500*	
6	Social desirability	.050*	.655
	Mastery approach	-.044	
	Mastery avoidance	.023	
	Performance approach	.072*	
	Performance avoidance	.019	
	RAI	.108*	
	Amotivation	.028	
	Moral behavior	-.002	
	Attitudes	.186*	
	Subjective Norm	.057*	
	Descriptive Norm	-.002	
	PBC	-.091*	
	Situational temptation	.430*	
	Reported past PED use	.267*	

Note. * $p < .05$, RAI = relative autonomy index, PBC = perceived behavioral control.

4.7. Analysis of indirect effects

Following Preacher and Hayes' (2008) method, multiple mediation modeling was used to examine the mediation effects proposed in our theoretical model. Specifically, it was expected that self determination (reflected in RAI and amotivation scores), and achievement goals would predict PED use intentions indirectly, through the effects of moral behavior

and TPB variables (including descriptive norms and situational temptation). In a similar vein, TPB variables were also expected to mediate the effects of moral behavior on PED use intentions. Bias-corrected confidence intervals (95% CI) for standard errors were estimated using bootstrapping (1000 resamples).

Firstly, the direct and indirect effects of RAI and amotivation were examined. Regarding RAI, the findings showed that although the total effect was non-significant, the direct effect was significant. This suggests a potential suppressor effect of the hypothesized mediators (moral behavior and TPB variables). In fact, attitudes and subjective norms had significant effects ($z = -4.34$ and $z = -2.94$ respectively, both $p < .0001$). This finding may also indicate that the role of RAI becomes significant only after the consideration of more proximal predictors of prohibited PED use intentions, such as attitudinal and normative beliefs. As far as amotivation is concerned, the total effect was significant ($\beta_c = .299$, $p < .0001$), whereas the direct effect was non-significant ($\beta_c = .016$, $p > .05$), suggesting full mediation. In fact, situational temptation ($z = 7.21$, $p < .0001$), attitudes ($z = 6.25$, $p < .0001$), subjective norms ($z = 4.51$, $p < .0001$), and PBC ($z = 2.58$, $p < .005$) had the strongest mediation effects. The effects of moral behavior and descriptive norms were non-significant.

Secondly, the direct and indirect effects of achievement goals (mastery and performance goals) on doping intentions were assessed. The effect of mastery approach was fully mediated by ($\beta_c = -.042$, $p > .05$) by the standard TPB variables, namely attitudes ($z = -5.77$, $p < .0001$), subjective norms ($z = -4.10$, $p < .0001$), and PBC ($z = -3.56$, $p < .001$). The effect of situational temptation was marginally non-significant ($z = -1.89$, $p = .058$), and the effects of descriptive norms and moral behavior were non-significant ($p > .05$).

Also, mastery avoidance goals had a significant total effect ($\beta_c = .079$, $p < .05$), but a non-significant direct effect on doping intentions ($\beta_c = .036$, $p > .05$), indicating full mediation. More specifically, the effect of mastery avoidance was significantly mediated only by PBC ($z = -2.09$, $p < .05$) and situational temptation ($z = -2.46$, $p < .05$). This suggests that mastery avoidance goals are likely to affect temptation and behavioral control beliefs, which, in turn predict PED use intentions.

Accordingly, the total ($\beta_c = .146, p < .0001$) and direct effects ($\beta_c = .053, p < .05$) of performance approach were significant, suggesting partial mediation. However, only situational temptation had a significant mediation effect ($z = 4.03, p = .0001$). Finally, performance avoidance was partially mediated ($\beta_c = .165, p < .0001, \beta_c = .042, p < .05$) by attitudes ($z = 2.32, p < .05$), subjective norms ($z = 2.70, p < .05$), and situational temptation ($z = 6.28, p < .0001$), which had the strongest effect. Moral behavior, descriptive norms and PBC did not exert significant mediation effects.

Thirdly, moral behavior had a significant total effect ($\beta_c = -.321, p < .0001$) on doping intentions, but total indirect effect was non-significant ($p > .05$), suggesting full mediation. Attitudes towards doping use ($z = -6.60, p < .0001$), situational temptation ($z = -5.01, p < .0001$), and subjective norms ($z = -4.60, p < .0001$) had the strongest mediation effects, followed by PBC ($z = -3.52, p < .0001$). The effect of descriptive norms was non-significant.

5. DISCUSSION

5.1. Motivational and sportspersonship profiles

Self-determination profiles and prohibited PED use

One of the aims of the present study was to identify whether elite athletes with different motivational and sportspersonship profiles are more prompt to use prohibited substances to enhance their performance. Firstly, meaningful self-determination profiles emerged and these profiles differed with respect to intentions to use prohibited substances: athletes in the 'Amotivated' group reported significantly higher intentions to use prohibited PED in the future compared to highly motivated athletes. Interestingly, the three-group classification of self-determination profiles was not based upon the central self-determination types of motivation (i.e., intrinsic and extrinsic motivation and amotivation). However, this classification is in support of self-determination theory as it suggests that motivation is not a bipolar construct where athletes are classified either as intrinsically or extrinsically motivated. Rather, self-determination is more likely to lie on a continuum that allows that athletes to display different levels of self-determination.

Furthermore, the first group of athletes ('Highly Motivated') was the largest one ($n = 452$) and showed high scores in almost all the motivation dimensions. Yet, the scores of intrinsic motivation dimensions were higher than those of the extrinsic motivation dimensions, whereas the amotivation scores were rather low. Highly motivated athletes can be seen as participating in sport because they're interested in it, for the enjoyment and pleasure derived from doing so, as well as for the possibility of gaining rewards and recognition.

Taking into consideration that the sample of the study were elite (and in many sports professional) athletes it seems rationale for them to score high in both intrinsic and extrinsic motivation dimensions. Elite athletes spent most of their time and energy in practices and sport related activities (i.e., physiotherapies, massage etc), which, to a great extent, requires an interest

towards this kind of activities. On the other hand, as elite and professional athletes they are also interested in the rewards, because rewards largely reflect the outcome of athlete's efforts. In this case, both interest and pleasure for the activity and striving for rewards are thought to be strong motivating factors that influence sports participation.

In the second group ('Amotivated') the scores in intrinsic and extrinsic motivation dimensions were the lowest among the three groups (with the exception of external regulation), whereas that of amotivation was the highest one. These athletes seem to have lost interest in sports. They are not interested in sports anymore, the enjoyment and the pleasure derived from sports involvement faded away, and they are concerned with the possible 'psychological' rewards (i.e., high sense of self, avoid guilt etc). On the other hand, they seem to be interested in external rewards. In this group, athletes are characterized by low perceptions of competence and loss of control that lead to withdrawal of effort. This is the least self-determined group. It might include athletes that have reached a plateau in their performance or they are at the end of their career and they put a lot of emphasis in gaining external rewards.

In the third group ('Low Motivated') the scores in all motivation dimensions were medium to low. Taking into consideration that the scores for external regulation and amotivation were low, it could be assumed that athletes in this group are participating in sports for internal reasons. But it seems that they are not the top level athletes in their sport. In this sense, they don't receive high external rewards and their systematic under representation in their sport (i.e., being consistently a substitute, never winning medals etc) undermines their inherent interest for sports and lessens enjoyment and pleasure derived.

Regarding self-reported past use of prohibited substances, no significant differences were revealed among the three self-determination groups. This implies that there are no differences in the self-determination profile of ever and never users of prohibited substances. On the other hand, significant differences were found in pro-use intentions. Athletes in the 'Amotivated' group had the higher scores compared to those in the 'High Motivated' group. These findings imply that amotivated athletes are keen on using prohibited

substances for performance-enhancement purposes. As discussed earlier athletes in this group are thought to have low perceptions of competence and loss of control. Additionally, they withdraw effort as they seem to believe that it won't help them to gain further external rewards. Thus, they might believe that the use of prohibited substances could reverse this situation, by helping them increase their competence, overcome the possible performance plateau, and give them the edge to achieve more external rewards.

These findings are consistent with the theoretical predictions (Deci & Ryan, 1985) and research evidence (Vallerand, 1997; 2007) suggesting that low self-determination is associated with maladaptive response patterns, such as low performance, persistence, effort and enjoyment and more negative affectivity. On the other hand, participation due to internal reasons (i.e., intrinsic motivation and self-determined dimensions of extrinsic motivation) was not associated with such responses. These findings imply that the coaches should foster intrinsic motivation and provide opportunities for success to all their athletes. However, given that no differences were observed in self-reported past use, it could be assumed that, although the lack of self-determination is associated with stronger pro-use intentions, other variables may facilitate the transformation of use intentions into actions.

Achievement goal profiles and prohibited PED use

With respect to achievement goal profiles, the results of the cluster analysis revealed three distinct groups. These groups differed in both past use and intentions for future use of prohibited substances. The first group ('Mastery Oriented') consisted of the athletes ($n = 299$) scoring high in mastery goals (approach and avoidance) and low in performance goals (approach and avoidance). The second group ('Approach Oriented') consisted of those ($n = 280$) with high scores on the approach goals (mastery and performance) and low in the avoidance goals (mastery and performance).

According to the theoretical predictions, competence can be differentiated either in terms of definition, or in terms of valence (Conroy, et al., 2003; Elliot, 1999). This led to the distinction of definition-related goals (i.e., mastery versus performance) and valence-related goals (i.e., approach versus avoidance goals). The first two groups of the cluster analysis in our study indeed reflect these two conceptions of competence. The first one represents

the definition-related goals including athletes that put more emphasis on mastering tasks, self-improvement and the use of self-references criteria to define success rather than social comparison. The second group represents the valence-related goals including athletes striving for positive outcomes such as development and demonstration of competence. These findings provide evidence on the definition versus valence distinction and support the 2 X 2 achievement goal model (Conroy et al., 2003; Elliot & McGregor, 2001; Murayama & Elliot, 2009).

Furthermore, the present findings support the adoption of multiple goals in sport contexts (see also Pintrich, 2000). So far, definition goals have been examined in general education and physical education (Barron & Harackiewicz, 2001; Daniels et al., 2008; Roebken, 2007; Steinberg, Singer & Murphey, 2000; Thomas & Barron, 2006). These studies revealed that the adoption of multiple goals (i.e., mastery and performance approach goals) is associated with a more positive pattern of responses. However, this line of research suggested that the adoption of mastery goals was more strongly associated with positive outcomes. In these studies the dichotomous or trichotomous approach to achievement goal was adopted. None of these studies employed the 2 X 2 approach. Hence the findings of the present study extend achievement goal research by showing that multiple goals based on valence of competence exist and may be meaningful.

The third group ('High Achievers') which was the largest one ($n = 452$) included athletes scoring high in all achievement goals. In this group athletes could adopt achievement goals that conceptually differ. For instance, an athlete could score high both on mastery-approach and performance-avoidance goals. As reported earlier, this is the first study, to the best of our knowledge, which created achievement goal profiles using the 2 X 2 approach. The findings concerning this third group imply that athletes can adopt multiple goals beyond the definition and valence distinction. Hence, the interplay between the four achievement goals may be meaningful.

The analysis of variance indicated that the three achievement goal groups differed significantly in both past use and intentions for future use of prohibited substances. Specifically, the 'Mastery Oriented' athletes were those with the lower scores on past use and intentions. These findings are consistent with

both traditional (Nicholls, 1989) and contemporary (Elliot, 1997; Elliot & McGregor, 2001; Murayama & Elliot, 2009) approaches suggesting that mastery oriented athletes will show the most positive pattern of responses. On the other hand, our findings contradict previous research evidence on multiple achievement goals (Barron & Harackiewicz, 2001; Daniels et al., 2008; Roebken, 2007; Steinberg et al., 2000), which suggested that the pursuit of both mastery and performance (approach) goals is associated with positive outcomes from activity involvement. For instance, the Steinberg et al. (2000) study in sport settings indicated that golf athletes in the mastery-performance goal group significantly increased their intrinsic motivation and task persistence, while there was trend for improved performance compared to mastery and performance goal groups. Similarly in educational settings mastery-performance groups were higher or equal to mastery group and higher to performance groups on cognitive appraisals, achievement-related emotions, academic satisfaction, academic engagement and academic achievement (Daniels et al., 2008; Roebken, 2007). However, the 'approach oriented' group of the present study, which describes these athletes, scored significantly higher in both past use and intention to use prohibited substances. Taking into consideration that the use of prohibited substances is illegal, the 'approach oriented' athletes were found to be more susceptible to employ maladaptive behaviors compared to 'mastery oriented' athletes. Comparing these two groups, it seems that an emphasis in performance approach goals is the distinguishing factor resulting in the adoption of maladaptive behavior. On the other hand, a strong mastery orientation, even including an avoidance dimension, is not expected to lead to such behaviors. Athletes in the approach oriented group were considered to represent those athletes striving for positive outcomes from sport involvement, such as self-improvement and demonstration of high competence. It is possible that they believe that prohibited substances will give them the edge to achieve these positive outcomes (especially the demonstration of high competence). These findings imply that these athletes are prompt to use any necessary means in order to achieve their goals.

The third group (i.e., 'high achievers') showed the least adaptive profile. These findings are consistent with theory (Elliot, 1997, 1999) and research

(Carr, 2006; Daniels et al., 2008), which suggests that the adoption of avoidance goals is associated with negative responses. 'High achievers' are perhaps athletes that, beyond striving for positive outcomes, experience a fear of demonstrating low competence (especially compared to other athletes). It seems that this fear is an important motivating factor to engage in maladaptive behaviors, such as the use of prohibited substances.

Sportspersonship profiles and prohibited PED use

With respect to sportspersonship, the results of the cluster analysis revealed two meaningful groups. The first one was labeled 'Low sportspersonship' and represented the athletes ($n = 256$) showing little respect to social conventions, rules and officials and opponent, and low commitment to sport. This group includes athletes with low morality in sport settings. The second one ('High sportspersonship') included athletes ($n = 777$) scoring high in all sportspersonship dimensions, and reflects high morality in sports. Interestingly, these groups did not differ on either past use or intentions to use prohibited substances. These findings contradict theoretical predictions (Vallerand et al., 1997) and research evidence (Duda et al., 1991; Morris & Kavussanu, 2008) suggesting that athletes with low morality will have the tendency to employ illegal, unethical and maladaptive behaviors, such as the use of prohibited substances. A possible explanation for these findings may be that athletes do not perceive the use of prohibited substances as unethical. This contradicts an important aspect of anti-doping policies, which lies on the perception that the use of prohibited substances is unethical as it gives advantages to users compared to non-user and that a user is an unethical individual. The results of the present study, however, did not show differences in the sportspersonship profiles of past users/non-users and intenders/non-intenders. This raises some important questions on the ethical aspect of doping. A growing body of arguments on this issue suggests that doping policies are based on the fault-line between the will to purity and the will to win (Moller, 2008), whereas there are increasing voices requesting to legalize drugs in sport (Kayser & Smith, 2008; Savulescu, Foddy, & Clayton, 2004).

Overall, these findings indicate that different motivational profiles are associated with the use or the intention to use prohibited substances. More

specifically, athletes with low self-determined profile and athletes adopting avoidance goals were more prompt to use such substances. On the other hand no differences emerged regarding the sportspersonship profiles implying that the use of prohibited substances is associated with the morality of the athlete. Clearly more research is needed to investigate the effect of motivational and sportspersonship variables on both actual use and intention to use in the future prohibited substances. According to Vallerand et al. (1997) and Donahue et al. (2006) sportspersonship can mediate the effect of achievement goals and motivational regulations on behavior. In this case, it would be interesting to test this sequence with respect to the doping behavior and cognitions.

5.2. Distal and proximal predictors of PED use intentions

Four regression analyses were conducted in order to examine the unique predictive effects of achievement goals, self-determination, sportspersonship and beliefs about the causes of success, and TPB variables respectively on PED use intentions. These analyses did not explicitly assess the association and causal pathways described in the proposed theoretical model of the study. Rather, they helped identifying the dimensions of each predictor that had the strongest effect on doping intentions, and, hence, provide information on the efficacy of each theoretical approach to contribute to the understanding of processes underlying the formation of PED use intentions. The effect of each variable was examined after controlling for the effects of social desirability, because partial correlation analysis (using the VRR) indicated that social desirability had a nuisance effect by inflating associations between doping intentions and some predictor variables, and, therefore, its effects should be controlled for.

Regarding self determination, only introjection and amotivation significantly predicted PED use intentions. These findings support the results obtained in the cluster analysis (reported earlier), by showing that amotivated athletes are likely to report strong PED use intentions. Surprisingly, introjection, which is an aspect of extrinsic motivation, had a negative effect, showing that athletes with high extrinsic motivation scores are less likely to intend to use prohibited substances for performance enhancement purposes.

These findings imply that amotivation is the determining factor that can lead to maladaptive behaviors such as doping. Also, among the four achievement goal dimensions, mastery approach had a negative significant effect, whereas performance avoidance had a positive significant effect on doping intentions. This suggests that athletes with a task orientation (i.e., striving for mastery), are less concerned with using unfair means to compete against other and increase individual performance. On the other hand, athletes who are motivated to avoid low performance are more likely to endorse prohibited PED use.

With respect to moral behavior, one sportpersonship dimension, namely social conventions, had a significant negative effect on PED use intentions, suggesting that athletes adhering to conventions and protocols of sports participation are less likely to endorse doping practices. Similarly, those believing that success in sports results from individual effort were less likely to intend to use prohibited PED, whereas those attributing success to external factors were more likely to intend to use banned substances. Although the reasoning behind the effects of beliefs about the causes of success in sports lacks a sound theoretical background, one can easily see that the findings reveal a process that appeals to logic. Specifically, athletes attributing success to internal forces and personal agency (e.g., effort) do not endorse the use of banned substances to increase performance, compared to athletes who believe that success is not controlled by the person. These findings also suggest that a tailor-made measure of locus of control (i.e., attributing control of behavior to internal or external factors) might be useful in better understanding the psychological processes underlying the formation of pro-use intentions.

Finally, the regression analysis indicated that the variables derived from the TPB (attitudes, normative beliefs, and PBC) were the strongest predictors of PED use intentions. In fact, situational temptation, which was added as an alternative measure of behavioral control beliefs had the strongest effect, and acted as a potential mediator. These findings are important in the following respects. Firstly, they indicate that TPB variables are proxy predictors of intentions, compared to other variables, including self-determination and achievement goals. This is evident in the multivariate effect size produced in

each regression analysis (i.e., TPB variables predicted up to 60% of the variance in intentions, compared to much weaker effect sizes of other predictors). Secondly, the findings show that the standard TPB structure can be modified to include alternative measures of normative influences and behavioral control beliefs. That is, although the effect of descriptive norms was relatively small, it was still significant. In a similar vein, the inclusion of situational temptation was rather useful as it revealed another important dimension of perceived behavioral control/self-efficacy in the domain of doping behavior. In fact, situational temptation had a much stronger predictive effect, as compared to its more traditional alternative (i.e., PBC) suggested by the TPB. Thirdly, the VRR analysis indicated that social desirability was less likely to exert a nuisance effect on associations between TPB variables and PED use intentions. Thus, The TPB variables seem to be the least susceptible to social desirability effects, compared to other predictors. Fourthly, the inclusion of situational temptation revealed a very important normative process. In line with current findings in the substance use literature (e.g., Lazuras et al., in press), situational temptation fully mediated the effects of descriptive norms, and partially mediated the effects of subjective norms on intentions. This indicates that situational temptation plays a key role in normative influences on doping use: athletes believing that doping is prevalent and socially acceptable also believe they cannot resist doping offers and pressures to engage in doping under specific circumstances (e.g., when the coach urges the athlete to engage in doping, or when preparing for an important game/contest). In turn, situational temptation beliefs transform into stronger pro-use intentions. Therefore, part of the normative influences on doping intentions seems to be internalized into behavioral control beliefs, which then act as more proxy antecedents of intentions, and perhaps of actual behavior.

5.3. Direct and indirect effects on PED use intentions

A hierarchical regression analysis and multiple mediation modeling were used to respectively assess the hypothesized direct indirect effects on PED use intentions. The regression examined the direct effects of distal predictors including self determination (assessed by RAI and amotivation), achievement

goal orientations, sportspersonship orientations (assessed by the 'moral' composite score), and proximal predictors of PED use intentions (i.e., TPB variables, descriptive norms, situational temptation, and past use of prohibited PED), after controlling for the effects of social desirability. As expected, the findings revealed that the distal predictors influenced PED use intentions largely through the effects of more proximal variables. Specifically, only one dimension of achievement goals (i.e., performance approach) and self-determination (RAI score) retained a unique effect on intentions, even after controlling for TPB variables, situational temptation, and past use of prohibited PED. Also, among the proximal predictors of intentions, situational temptation, past PED use, and standard TPB variables had the strongest effects. Finally, social desirability retained a comparably small, but significant effect on intentions.

Subsequent analyses of the indirect effects were more revealing of the processes underlying the formation of PED use intentions. In particular, the findings showed that RAI can have a significant effect on PED use intentions only after controlling for the effects of more proximal predictors, such as attitudes and subjective norms. This suggests that motivational dispositions, such as motivational regulations, affect behavior through the effect of other variables, which are more proximal to the decision-making process. That is, motivation provides the 'personal theory' of the athlete that affects the process of decision-making, which in turn affects behavior.

Accordingly, amotivation was fully mediated by standard TPB variables and situational temptation. This shows that amotivated athletes are likely to form pro-use attitudes and normative beliefs, perceive less control over doping use, and greater susceptibility to endorse doping practices under pressure. These beliefs, in turn, lead to stronger pro-use intentions. Practically, this means that amotivated athletes can be considered as an at-risk group for doping, and this was also indicated by the cluster analysis reported earlier. The risk for doping, however, may potentially be reduced by targeting maladaptive attitudes, normative beliefs and behavioral control beliefs. Specifically, interventions 'inoculating' amotivated athletes against doping practices may include efforts to a) change pro-use attitudes into anti-doping beliefs, b) convey that doping is not socially acceptable, c) persuade

athletes that they actually have control over the substances they use to enhance their performance, and d) teach resistance skills so that offers of prohibited PED are declined effectively. Some aspects of this approach, however, might require change both at an individual/team and at a societal level. That is, conveying the message that doping practices are not accepted by the society requires concerted efforts to promote a strong anti-doping message, and correcting biased beliefs of doping prevalence. This is relevant to the point addressed earlier in the discussion of normative processes, whereby descriptive norms (i.e., overestimation of prohibited PED use by elite athletes in Greece) were found to predict PED use intentions indirectly, through the effects of situational temptations. Therefore, further identifying the reasons why maladaptive normative beliefs are formed is a necessary step towards a better understanding of the social forces that guide doping practices in sports.

In relation to achievement goals, the multiple mediation analyses showed that mastery goals were fully mediated by more proximal, but different predictors of PED use intentions. In particular, mastery approach goals were mediated by standard TPB variables, suggesting that the tripartite of attitudes-subjective norms-PBC can usefully explain the process whereby the concern for learning new skills (i.e., mastery approach) may potentially lead to pro-use intentions, and thus significantly increase the risk for engagement in doping practices. Mastery avoidance, however, was mediated only by behavioral control beliefs. This is theoretically important, as it shows that, although newly introduced in the traditional achievement goal theory tradition, mastery avoidance can explain part of the process leading to pro-use intentions. In fact, athletes avoiding lack of improvement and task failure are more likely to believe they cannot control doping use, and perceive greater susceptibility to endorse doping practices.

Furthermore, performance approach and avoidance goals were partially mediated by the hypothesized mediators. Specifically, performance approach was partially mediated by situational temptation, whereas performance avoidance was partially mediated by attitudes, subjective norms, and situational temptation. These findings suggests that athletes focusing on outperforming others (i.e., performance approach) may already have plans for

using prohibited substances, but also construct maladaptive behavioral control beliefs by perceiving themselves highly susceptible to situational pressures to engage in doping practices, such as PED use offers by the coach, and when preparing for an important competition. Teaching resistance skills to those athletes may be part of the work required to prevent doping use. Given that the mediation effect was only partial, preventive efforts should also target the adoption of adaptive achievement goals (i.e., mastery approach goals). In a similar vein, athletes striving to avoid displaying low competence (i.e., performance avoidance) form pro-use attitudes, perceive prohibited PED use as socially acceptable, and feel at greater risk to endorse doping use under pressure. Clearly, those beliefs can be targeted by preventive intervention, but granted the partial mediation effect, it is equally important to change athletes' focus from avoiding to perform poorly.

Contrary to our expectations and previous research (e.g., Donahue et al., 2006; Duda et al., 1991), however, sportpersonship beliefs did not mediate the effects of self-determination and achievement goals on prohibited PED use intentions. This is a novel finding, and suggests that maladaptive achievement goal orientations and motivational regulations (e.g., low intrinsic motivation, amotivation) may predict pro-use intentions – and thus the risk for engagement in maladaptive and illegitimate acts – without the necessary mediation of moral behaviors. This is important for it shows that athletes intending to use prohibited substances are not necessarily the ones who engage in otherwise 'immoral' behaviors and display low sportpersonship. Based on this finding, it can be argued that interventions aiming to raise the importance of ethics in sports and the unethical nature of doping may not be as effective as interventions addressing more important and significant predictors of PED use intentions, such as attitudes, normative and behavioral control beliefs. This assertion is further supported by our finding where moral behavior (indicated by scores in the respective composite measure of sportpersonship orientations) predicted PED use intentions indirectly, through the effects of standard TPB variables (attitudes, subjective norms, PBC) and situational temptation. In fact, the so-called 'immoral' athletes seem to be at higher risk for doping, after they have internalized low sportsmanship into attitudinal, normative, and behavioral control beliefs.

Overall, the findings from the mediation analyses showed that motivational regulation or self-determination can exert their effects on pro-use intentions indirectly, through the effects of more proximal measures. This is in line with past research on sports behavior (e.g., Hagger et al., 2002), and suggests that previous findings can be extended to better understand aspects of doping behavior. Accordingly, achievement goal orientations can help researchers and policy-makers identify athletes at risk for use of prohibited substances, as both approach and avoidance goals can lead to stronger pro-use intentions, either directly or indirectly. Finally, it should be remarked that sportpersonship orientations, which were used in the present study as indicators of moral behavior in sports, is not as strong and important predictor of PED use intentions as we initially hypothesized. Specifically, unlike previous findings, sportpersonship did not mediate the effects of distal variables on PED use intentions. Furthermore, sportpersonship did not retain a significant effect on intentions, as it was fully mediated by more proxy variables. It seems, therefore, that targeting the formation of maladaptive beliefs about doping may be more important than raising the issue of ethics and morality in sports. To corroborate the findings from the analyses reported earlier, unethical behavior may define athletes at risk for doping, but is also more susceptible to influences of social desirability (therefore it may be difficult to spot athletes with 'unethical' profiles), and unlikely to have a direct effect on pro-use intentions.

5.4. Conclusions

On the whole, the present study explored the effects of proximal and distal variables on intentions to use prohibited substances. In line with previous findings and our expectations, proximal predictors, such as attitudinal, normative, and behavioral control beliefs played a pivotal role by mediating fully or partially the effects of distal variables (i.e., motivational regulations, achievement goal orientations, sportpersonship orientations) on PED use intentions. Also, more detailed analysis indicated a dynamic interplay between the proximal predictors (e.g., temptation mediated the effects of normative beliefs on intentions). Our findings can be summarized

and used as the empirical basis for future interventions to prevent prohibited PED use in sports in the following way:

1. Motivation dispositions (i.e., achievement goals and motivational regulations) can affect the use and the intention to use prohibited PED. Hence, future interventions and campaigns should target the manipulation of athletes' environment to foster adaptive motivation dispositions such as mastery approach goals and intrinsic motivation.
2. Doping is not considered as an unethical behavior. That is athletes using prohibited PED do not perceive themselves as 'immoral persons'. Therefore, interventions and campaigns in the future should not focus on the athletes' ethics but target on informing and teaching *why* doping is unethical and should be punished.
3. Doping is not a spontaneous behavior but requires planning. As such, it strongly associated with variables involved in the planning and decision making process, such the TPB variables. Future interventions and campaigns should focus on these variables by changing the athletes' attitudes towards doping, developing a sense of personal control and responsibility and by educating the athletes' social environment (i.e., peers, teammates, parents etc) on the side effects and the unethical nature of doping.

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