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Prototype perceptions of the adolescent performance-enhancing substance user: A mixed methods study among Italian male recreational athletes

Giovanni Aresi*/**, Chiara D'Angelo*/**, Amalia de Leo*, Eloisa Cianci, Caterina Gozzoli*/****

(*) Psychology Department, Università Cattolica del Sacro Cuore, Largo Gemelli 1, 20123, Milano, Italy.
(**) Cerisvico Research Centre on Community Development and Organisational Quality of Life, Via Trieste 17, 25121, Brescia, Italy.
(***) Alta Scuola Agostino Gemelli, Università Cattolica del Sacro Cuore, Largo Gemelli 1, 20123, Milan, Italy.

This study employed a sequential explanatory mixed-methods approach to investigate the perceptions of Italian male adolescents (aged 14-19) regarding the characteristics of a typical doping user in recreational sports. In the initial phase of the study, the survey data were subjected to analysis with a view to identifying the adjectives most commonly used to describe the prototypical image of a doping user. The statistical validity of the conceptual domains was tested using Explorato-

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Correspondence to: Dr. Giovanni Aresi, Psychology Department, Università Cattolica del Sacro Cuore, Largo Gemelli 1, 20123 Milano, Italy (E-mail: giovanni.aresi@unicatt.it)

ry Structural Equation Modelling (ESEM). In Phase 2, focus group interviews were conducted with the objective of providing further insight into the quantitative results obtained in Phase 1. The findings indicate that the prototype is centred around four domains: approach to risk-taking, sportsmanship orientation, attitudes towards competition, and artificiality. The typical amateur substance user is described as having an unhealthy attitude towards competition, disregarding sportsmanship and health risks due to a lack of self-confidence and being susceptible to competitive and social pressure. Additionally, concerns about identity and the threat to authenticity and self-acceptance are significant. These findings may be utilised to focus interventions, allowing for the integration of prototype dimensions into their activities.

Key Words: Doping, performance and appearance enhancing substances, Prototype, recreational sport, Aadolescents, mixed methods.

The use of Performance and Appearance Enhancing Substances (PAESs) is a major issue in elite competitive sports and a growing concern among recreational athletes (Dunn et al., 2012; FAIR, 2019). PAESs have various definitions (Blank et al., 2016), but they are generally classified as either permitted or unpermitted substances. Permitted PAESs are commercial substances that are allowed for use in sport, such as energy drinks, nutritional supplements, and over-the-counter medicines (e.g., anti-inflammatory drugs) (Didymus & Backhouse, 2020). Unpermitted PAESs, on the other hand, are banned "*substances that are controlled by the government and/or a sport governing body such as the World Anti-Doping Agency*" (Lazuras et al., 2017, p. 3). The use of unpermitted PAESs, also known as doping, poses a significant threat to the health of athletes. The use of PAES is increasing across all age groups and levels, including recreational athletes. Some argue that this increase is due to the medicalisation and substance-enhanced lifestyle and sports practices in our society (Pedersen, 2010; Petróczi, 2013).

Following extensive research focussing on the use of doping in elite and professional athletes (Blank et al., 2016), recent years have seen a rise in the number of studies on those who practise sport recreationally, including those of a young age. Doping can be particularly harmful to the developing body (Thiblin & Petersson, 2005), and it can also have long-term consequences, as lifestyles and health-related behaviours that are established at a young age tend to persist during adulthood (Wiium et al., 2015). A small but increasing proportion of adolescents use PAESs. PAESs use can be initiated as early as 12 years of age (Nicholls et al., 2017). A study in France demonstrated that the proportion of users has increased almost threefold, from 1.2% to 3.0%, in the four years 2001 to 2005 (Laure & Binsinger, 2007). Studies on samples from French and Italian high schoolers estimated that between 1.5% and 2.3% of students use banned substances (Mallia et al., 2013; Shah et al., 2019).

In all studies, males were found to be more susceptible to doping. Doping may be used as a strategy by males to address body dissatisfaction and outcompete others, enhancing their physical performance and appearance (Yager & O'Dea, 2014). It is important to note that doping use is associated with involvement in other risky behaviours, such as tobacco use and heavy alcohol consumption, which are more prevalent among men in general (Aresi et al., 2018; Nicholls et al., 2017; Tsitsimpikou et al., 2018).

Doping Use in Recreational Sport Settings

Data from the Eurobarometer (European Commission, 2017) indicate that 44% of European adults engage in some sport activity and that most physical exercise takes place in informal settings (e.g., public parks and courts). Recreational sport is any "*sport, exercise [or] physical activity which takes place in low-level competitive or non-competitive environments and engages individuals at sport events, fitness centres, sport and leisure clubs, and outdoor-based activities*" (European Commission as reported in FAIR, 2019, p. 12). Athletes report doping for various reasons, including improving performance, winning competitions, enhancing physical appearance, responding to external pressure, and fearing competitors with an unfair advantage due to chemical or medical enhancements (Barkoukis et al., 2019; Petróczi & Aidman, 2008). Nevertheless, the relationship between doping use and performance enhancement in recreational settings is not straightforward (Zelli et al., 2010) and is not universally understood across different sports (Christiansen et al., 2023). The involvement of competition in recreational sport is not a universal phenomenon. Furthermore, in the event that competition does occur, the enforcement of anti-doping rules is often lacking. Moreover, the lack of anti-doping measures in lower-level or non-competitive events may also result in a reduction in awareness and understanding of the dangers of prohibited substances (FAIR, 2019). Additionally, aesthetic objectives may be prioritised over physical performance, particularly in gym and fitness sports (Coquet et al., 2018). Conversely, in sports such as cycling, these objectives are not applicable and performance enhancement is the primary concern (Christiansen et al., 2023).

In consideration of the aforementioned factors, other researchers adopted a social scientific approach to defining "doping" as a substitute for relying on legal or theoretical definitions (Christiansen et al., 2023). This signifies that, in lieu of utilising the legal definition of the term as prescribed by WADA, we instead drew upon the respondents' comprehension of dop-

ing and the perceived prohibitions within their respective sporting domain. It seems reasonable to posit that the knowledge surrounding the list of prohibited substances is limited among non-professional athletes, particularly among those of a younger age. Consequently, the phenomenon of doping is considered in the context of its intentional or moral implications, as well as its ramifications for the practice of sport and the psychosocial dimension of the individual.

Research on adolescent non-elite athletes is limited. A study conducted in Germany found that both recreational and competitive athletes performed poorly on a doping knowledge test (Wanjek et al., 2007). Doping use and attitudes have been found to interact meaningfully with more general values such as attitudes towards cheating in sports (Mudrak et al., 2018). Several studies have reported a positive correlation between the perception of masculinity and the perception of muscularity, body image concerns, the use of nutritional supplements, and attitudes towards doping (Horcajo & Mateos, 2023; Nilsson et al., 2005; Yager & O'Dea, 2014; Zelli et al., 2010). Lazuras et al. (2017) proposed that the use of performance-enhancing substances among young athletes may be attributed to a "*competitive sports mindset*" (p.7). This mentality is characterised by a focus on immediate performance enhancement, coupled with a disregard for the harmful and long-term effects of doping.

This study employed prototype theory to investigate the social image of the characteristics of the doping user among Italian adolescents who engage in recreational sports, in an effort to contribute to preventive intervention measures.

Context Of Study

In Italy, the National Anti-Doping Organization (NADO Italia) has prioritized the fight against doping since its establishment in 2015. As a functional branch of the World Anti-Doping Agency (WADA), NADO Italia has the authority to test athletes of all categories, including youth and amateur competitors, regardless of their competitive level. These athletes are registered with sports federations recognized by the Italian National Olympic Committee (CONI). Within the remit of NADO Italia lies the Committee for Education, Anti-Doping Training, and Research (CEFAR), which pursues the objectives of anti-doping research and training by planning, monitoring, and annually evaluating education programs and initiatives aimed at promoting the moral and cultural values underlying a sport free from doping.

It is increasingly recognised that the solution to the problem does not lie in relentless repression of behaviours, but in building and developing awareness and a critical perspective on the health risks that, for example, supplements can pose as gateways to doping substances (Pigozzi et al., 2020). CEFAR adopts an interdisciplinary approach to the issue of performance-enhancing substances, drawing upon ethical, educational, physiological and medical perspectives. The objective is to facilitate dialogue and intersection between various disciplinary knowledge, with the aim of supporting young athletes and the adults who work with them to develop a critical-reflective approach to the problem (Isidori et al., 2022).

Prototype of the Doping User

The study of prototype perceptions provides a novel approach that can supplement the research on the psychosocial determinants of doping. According to the prototype theory (Rosch, 1978; Rosch & Mervis, 1975), categories are structured around representative exemplars, or prototypes, that act as anchors for other members of the category. In the context of human behaviour, prototypes are personal characteristics, attitudes, and behaviours that are considered typical of a category of individuals, such as bus drivers or high school students. They are the result of social construction and social comparison processes, as people discuss their opinions about certain groups of people with others (Scott et al., 2015).

The prototype theory has been widely used in public health research, such as in the case of the typical adolescent smoker prototype (see, for example, Blanton et al., 2001; Gerrits et al., 2009; Piko et al., 2007; Zimmermann & Sieverding, 2010). Perceptions of prototypes are important components of the prototype willingness model (PWM) (Gerrard et al., 2008; Gibbons et al., 1998). According to this theory, the willingness to engage in health-related behaviours is positively associated with the perceived favourability (ideal self-image) and similarity (real self-image) of prototypes of people who engage in this behaviour. This association is a function of social comparison processes, whereby individuals compare themselves to others, including prototypical representations, to determine their worth (Ouellette et al., 2005). In essence, individuals tend to adopt the characteristics and behaviours of prototypes that they perceive as favourable and similar to themselves. Research conducted using the PWM to study doping has shown that individuals who perceive more favourable and similar prototypes are more likely to be willing to engage in doping (Dodge et al., 2012; Whitaker

et al., 2014). However, to our knowledge, only one study has examined the perceived characteristics of the prototype of a doping user among a sample of competitive athletes (Whitaker et al., 2012). The results showed that this prototype was characterised by a mixture of positive and negative attributes, including motivation to succeed, confidence, commitment, fear of competition, respect for rules, reliability, and sociability. However, there is limited knowledge regarding the perceived characteristics of the doping user prototype among adolescent amateurs.

With this study, we have made the first attempt to integrate qualitative and quantitative data to describe the characteristics of the doping user prototype among adolescents who participate in recreational sports. The study examined the characteristics of prototypes quantitatively using a list of unipolar (e.g., Piko et al., 2007; Spijkerman et al., 2005) or bipolar adjectives (i.e., semantic differential scales) (e.g., Gerrits et al., 2009; Zimmermann & Sieverding, 2010) developed specifically for the behaviour under study. However, it is important to note that mixed methods research, which combines both qualitative and quantitative data (Hesse-Biber & Johnson, 2015), can provide a more comprehensive and contextualised understanding of prototypes.

Thus, this study's novelty lies in the population studied and the use of a mixed methods approach. The results of this study will be crucial in developing antidoping interventions that target this population.

Study Aims and Mixed Methods Design

This study is a component of a broader project focused on researching and educating about doping use among adolescents (aged 14-19) in recreational sports settings[1]. We used a sequential explanatory mixed methods design (Creswell & Plano Clark, 2017) to depict the characteristics of the perceived prototype of doping users among Italian male adolescents who engage in recreational sports. The study focused on young men due to their higher likelihood of using doping and presenting specific risk factors related to body dissatisfaction, competitiveness, and engagement in risky behaviour including doping use (Aresi et al., 2018; Christiansen et al., 2023; Tsitsimpikou et al., 2018; Yager & O'Dea, 2014). In phase 1, survey data on adjectives describing the prototypical image of a doping user were collected and analysed. In

[1] The present research study is funded by the Doping Raising AWareness among youths in Sport recreational environments – DRAWS project. More information can be found at https://asag.unicatt.it/asag-draws-the-project.

phase 2, focus group interviews were conducted to elaborate on the quantitative results obtained in the first phase. From the perspective of mixed method research, integration entails the utilisation of qualitative data in a manner that builds upon and extends the insights derived from quantitative results, thereby facilitating a more comprehensive understanding of the phenomenon under investigation (Sparkes, 2015). This is reflected in the sequential structure of the study and the presentation of integrated results.

Phase 1

Methods

Data Collection

Male adolescents from Italy were recruited through sport clubs and schools that were part of the project partners' network, as well as direct contacts to recruit people in non-organised sports environments. To be eligible, potential participants had to be male, between the ages of 14 and 19, and engage in sports at a recreational level at least once a week. Adolescents who received any form of compensation for playing sports were excluded, as we were interested in recreational settings. No incentives were provided to the respondents for their participation. Informed consent was obtained from the participants or parents of those under 18 years of age to take part in the study. Data was collected between November 2020 and April 2021.

Participants

The sample consisted of 94 Italian male adolescent recreational athletes with a mean age of 16.4 years (SD = 1.64; range 14 – 19 years) after selection for eligibility from a total of 130 questionnaires collected. Nearly all participants (96.8%) were enrolled in secondary school. Of the participants, 15% (N = 14) reported having a migrant background, meaning they or at least one of their parents were from a country other than Italy. The participants engaged in various sports such as football, basketball, gymnastics, and swimming through sport clubs. It is noteworthy that all participants potentially fell under the purview of anti-doping tests during their sporting activities. Furthermore, 23.4% of the participants regularly engaged in a second sport. Ninety percent of the participants reported engaging in sports activities three to six times per week, and 94% took part in various competitions such as local leagues, tournaments, and city-run races.

Measures

The participants completed a survey comprising questions on their sociodemographic characteristics, including gender and age, as well as information on their primary sport, such as the type and frequency of participation. A comprehensive set of 39 items was developed to describe the characteristics of the prototypical image of a doping user (see Table S1

for details). This was done with reference to the findings of the literature review, particularly the works of Whitaker et al. (2012) and as well as the pilot qualitative study described in the Supplementary Document 1. To illustrate, items such as "winner," "committed to perform," "healthy," "fair," and "artificial" were selected from the pilot study, whereas "fears competition," "rule breaker," and "willing to win at all costs" were drawn from Whitaker et al. (2012), and "irresponsible," "willing to take risks," and "masculine" were drawn from Zimmermann and Sieverding (2010). The semantic differential technique is suitable for evaluating the intensity and direction of subjective perceptions (Verhagen et al., 2015). We adapted Zimmermann and Sieverding (2010)'s prototype prompt: "The following questions concern your images of people. For example, we all have an image of what distinguishes the typical movie star ('rich and pretty') or the typical grandmother ('sweet and frail'). However, we all know that not all movie stars or all grandmothers correspond exactly with these pictures, but many of them share some typical characteristics. Imagine now the typical person of about your age who uses doping substances. I think such a person in general **is…"**

Analyses

Little's missing completely at random (MCAR) test was used to check if missing data were completely at random – that is, whether the missingness pattern was completely unrelated to the variables considered (Newman, 2014) – before implementing further analyses. If this test provides nonsignificant results, then the missing data are completely at random. To achieve the same directionality, items were reversed as necessary (i.e. greater mean indicates greater perception that the item reflects a prototype characteristic). The mean of the items was then calculated. A cut-off point of >4.00 was used to determine inclusion of the items. This score was considered to reflect sufficient intensity of the perception that the characteristic was attributed to the prototype and was used as a criterion for inclusion. The final pool of items underwent a series of analyses, commencing with Exploratory Factor Analysis (EFA) and subsequently a novel analytic method designated Exploratory Structural Equation Modelling (ESEM; Asparouhov & Muthén, 2009). This method combines the characteristics of an exploratory factor analysis (EFA) and a confirmatory factor analysis (CFA) in that an EFA measurement model is subjected to a CFA model fit estimation. The ESEM method has the advantage over the CFA method in that it overcomes the overly restrictive assumptions and constraints that are inherent to the latter, particularly in regard to the secondary item loadings of indicators on more than one factor (Marsh, 2007; van Zyl & ten Klooster, 2022). The overall fit of the ESEM model was evaluated in accordance with the values for acceptable absolute, relative, and parsimony fit indices. The selection of these indices was based on their statistical power and their widespread use in structural equation modelling (SEM) (Kline, 2011). As indicative of absolute fit, we considered the values of the Root Mean Square Error of Approximation (RMSEA) <0.08, and the Standardized Root Mean Square Residual (SRMR) < 0.08. As relative fit indexes, we used the values of the Comparative fit index (CFI) and TLI were used > 0.90. M-Plus 7.11 was used for all analyses (Muthén & Muthén, 1998-2010) and De Beer and Van Zyl (2019) code generator package was used.

Prototypes Domains

A total of 25 items that scored 4.00 or less were excluded from the subsequent analysis. The results of Little's MCAR test on the 14 selected items ($\chi 2 = 126.907$; $df = 122$, $p = 0.362$) indicated that the missing data were completely random. As a preliminary step, an Exploratory Factor Analysis (EFA) was conducted on the 14 items. However, the results were inconclusive, with only one factor with an eigenvalue greater than one being extracted. This is despite the items pertaining to clearly distinguishable domains. Further details may be found in Supplemental Document 2. Consequently, the items were aggregated into domains on the basis of conceptual consensus among the research team. In accordance with the respective adjectives, the domains were designated as follows (see Table 1). The four factors were identified as follows: approach to risk-taking, sportsmanship orientation, orientation towards competition, and artificiality. In order to provide statistical support for the conceptual four-factor solutions, two ESEM models were subjected to a comparative analysis. Model 1 was a unidimensional first-order factor model that reflected the EFA results, indicating the presence of a single factor. Model 2 was a four-first-order ESEM that reflected the prototype conceptualisation. The model proposes that the four factors (i.e., thematic domains) are discrete yet interrelated components of the prototype. In this model, items are targeted to load onto their a priori factorial model, with the understanding that cross-loadings may occur; these are permitted but targeted to be close to zero. Table 2 presents the results of the ESEM models. Both models demonstrated satisfactory fit indices, with the exception of Model 1 RMSEA value. However, Model 2 exhibited a superior fit to the data, as indicated by a significant ΔX^2 value ($p < 0.001$), thereby providing statistical support for the four-factor solution employed in the subsequent qualitative phase of the study.

Table I.
Descriptive Statistics of Bipolar Items by Conceptual Domain.

Item	Adjective	Mean	SD	Domain
1	Irresponsible	4.42	1.14	Approach to risk taking
2	Willing to take risks	4.05	1.43	
5	Unreasonable	4.38	1.02	
8	Not health-conscious	4.16	1.45	
26	Lacking control	4.07	1.06	
20	Dishonest	4.41	1.02	Sportsmanship orientation
27	Rule breaker	4.45	1.00	
28	Not respectful of others	4.14	1.11	
39	Unfair	4.42	1.10	
29	Not self-confident	4.05	1.16	Orientation towards competition
32	Fears competition	4.15	1.16	
33	Willing to win at all costs	4.10	1.35	
19	Fake	4.22	1.06	Artificiality
23	Artificial	4.20	1.05	

Note: $N = 94$.

TABLE II.
ESEM Model Comparison

Model	Type	X^2	df	CFI	TLI	RMSEA	SRMS	AIC	BIC	aBIC	Delta X^2	Δ df	p
Model 1	Unidimensional model	141.403	77	0.923	0.909	0.094	0.048	3124.541	3231.359	3098.765			
Model 2	Four first-order ESEM	42.438	41	0.998	0.996	0.019	0.028	3097.576	3295.953	3049.707	98.965	36	< 0.001

Note. X^2, Chi-square; df, degrees of freedom; CFI, Comparative Fit Index; TLI, Tucker-Lewis Index; RMSEA, Root Mean Square Error of Approximation [90%CI]; SRMR, Standardized Root Mean Square Residual; AIC, Akaike Information Criterion; BIC, Bayes Information Criterion; aBIC, Adjusted Bayes Information Criterion.

Phase 2

Methos

Data Collection

Research assistants from local sports clubs in an urban area in northern Italy approached adolescents using snowball sampling to increase recruitment. Interested individuals, or their parents when underage, signed an informed consent form before completing a screening survey. The survey included questions related to basic demographic information and the sport practiced. The same eligibility criteria as in phase 1 were used. The discussions utilised a semi-structured script consisting of broad questions followed by open-ended prompts. The interview topic guide was divided into various sections. The introduction comprised a brainstorming session on doping substance users, which was used for group warm-up purposes. This was followed by open questions on participants' knowledge about Performance and Appearance Enhancing Substances (PAESs) and their perceptions of recreational athletes' motivations to use doping substances in sport. The second section presented the four prototype dimensions resulting from phase 1 to the participants. The dimensions were presented consecutively with the adjectives of each domain in clusters. Participants were asked to comment and elaborate on each dimension without the name of the group being explicitly stated. Focus group interviews were conducted in February 2022. A research assistant with training and experience in qualitative research moderated each focus group.

Participants

Four focus groups were conducted with a total of 24 male adolescents. Each session lasted approximately one hour and included five to seven participants. The mean age was 16.5 years (SD = 1.83; range 14 – 19 years). The participants engaged in football, basketball, gymnastics, and swimming in either a sport or school club. The majority (91%) reported practicing sports three to six times a week, and 79% participated in local competitions. Only two participants expressed their desire to become professional athletes in the future.

Analyses

The interviews were recorded digitally and transcribed verbatim. The transcriptions were anonymised and edited for accuracy. Descriptive codes of the model components (i.e. prototype dimensions) were created, and a deductive approach was used to analyse all transcripts to identify sub-codes of each dimension and eventually derive main themes (Braun & Clarke, 2006, 2021). The coding was conducted by the first author, and team discussions occurred at different stages of the analysis to contribute to theme generation.

Results of Phase 2

Results are presented in two main sections and subthemes that reflect the knowledge of and perceived motivations to use doping substances, as well as how participants described and made sense of the four dimensions of the user prototype. The text includes representative quotations for each theme. Table S2 contains additional illustrative quotations. Each quotation includes the participant's age and focus group number. Table 3 presents the integrated results of Phase 1 prototype adjectives and dimensions, accompanied by representative quotations that illustrate how participants described and made sense of each dimension of the user prototype.

Representations of Doping Use

Motivations for doping were primarily linked to enhancing physical appearance and improving performance. Some participants differentiated between professional and recreational settings, with the former being associated with performance enhancement and the latter with aesthetic goals. At the same time, participants acknowledged that doping use by young people at a recreational level may still be linked to performance enhancement. This is because, even at a non-professional level, athletes can demonstrate a great deal of competitive spirit and may wish to advance to higher categories, though not necessarily professional ones.

> The two main motives [to use doping] are related to how much you like your own body and to the desire to have good performance. (L.05, 16 years, FG1)

> I would make a distinction between professional athletes and amateurs. Professionals use these substances to win competitions; they want to push themselves to the limit, whereas amateurs do it for their physical appearance, not necessarily to win a race or a game. (G.20, 19 years, FG4)

> [Even at a recreational level] There is competition. Competition is everywhere, this idea that you must be the best in town. (M.19, 16 years, FG3)

In recreational settings, particularly in gyms where aesthetic goals are prioritised, individuals may feel undermined in comparison to others, leading to conformity pressure and fear of social exclusion. These factors have been identified as key drivers of doping use.

> Imagine you go to the gym and everyone around you is bigger than you. You might say, "Oh well, I'm taking this stuff too." (I.09, 14 years, FG2)

> I'll be honest, being excluded from a group could affect me. It might even be a reason to use doping. (M.19, 16 years, FG3)

Participants assumed that athletes who practice bodybuilding, running, cycling, and endurance sports are more likely to use substances due to the subculture of these sports encouraging doping.

> To me, it seems that doping is pretty common among bodybuilders and in the broader fitness industry, as well as in athletics. (S.02, 18 years, FG1)
>
> I associate substances with endurance sports, such as cycling. (F.13, 15 years, FG2)

Approach to Risk Taking

The terms associated with this domain were 'irresponsible', 'willing to take risks', 'unreasonable', 'not health-conscious', and 'lack of control'. The

Table III.
Integrated Results of Quantitative and Qualitative Study Phases.

Domain	**Phase 1. Adjectives**	**Phase 2. Explanatory Quotations**
Approach to risk taking	1. Irresponsible 2. Willing to take risks 5. Unreasonable 8. Not health-conscious 26. Lacking control	I think a user is unreasonable either because they trust their coach or the staff, or they know the risk involved, but they're still willing to take it. (V.24, 19 years, FG4) I've been thinking about going beyond one's limits. When I think of someone who uses doping substances, I think of someone who goes beyond the limits of their body. (S.04, 17 years, FG1)
Sportsmanship orientation	20. Dishonest 27. Rule breaker 28. Not respectful of others 39. Unfair	On the spot, you're probably feeling pretty good about achieving your goal and getting the result you wanted. But then, I think guilt might start to kick in. It's something I would personally have a hard time living with. It's about cheating yourself and those around you out of what you could have achieved. (S.04, 17 years, FG1) If you practise sport individually for yourself, like "I do drugs because this summer I want to be the biggest at the beach", that's fine, you do it at your own risk. However, if you're competing with others, it's about respecting them and following the rules. (L.15, 16 years, FG3)
Orientation towards competition	29. Not self-confident 32. Fears competition 33. Willing to win at all costs	It's not just about pushing past your limits. It's also about facing your fear of failure. (S.02, 18 years, FG) Over time, you start to think that you can only do well if you use the substance. (D.12, 14 years, FG)
Artificiality	19. Fake 23. Artificial	Participant: being natural means an athlete who is fair in sport. He has the right body for sport, meaning he can do sport, manage physical effort and bear the pain involved. Interviewer: 'You mean without using performance-enhancing drugs?' Participant: 'Yes, it's about using substances to enhance performance.' (M.08, 14 years, FG2).

participants described doping users as individuals who irresponsibly go beyond their own limits and are prone to take risks to achieve their goals. Users were also described as unreasonable and lacking self-control since they are driven by their goals and disregard the risks involved.

> Sometimes, an athlete knows what they're doing, knows the risks, but is so focused on achieving their goals that they ignore all the potential risks and see their goal as the only thing that matters. (M.23, 19 years, FG4)

> It is an unreasonable person because it does not make sense to use doping in youth sports at a recreational level. (D.12, 14 years, FG1)

The participants debated whether users of performance-enhancing drugs were fully aware of the risks involved. It was suggested that young athletes, in particular, may lack the necessary information to make an informed decision. Those who play in clubs may still be unaware of the risks and may trust their coaches, trainers, and other individuals who encourage them to use these substances. Others may be aware of the health risks but still choose to take them.

> Take fitness, for instance. Some people train just for fun and take drugs without really knowing what they're taking. Then there are those who play in a team, who can be advised by staff and feel more secure taking anything they're offered. (G.03, 18 years, FG1)

> Generally speaking, people don't know enough about the risks to their health. Some are aware of the risks but still want to do it. (M.19, 16 years, FG3)

Participants also mentioned that the desire to speed up recovery after an injury can alter the risk-benefit balance that athletes consider when contemplating the use of substances.

> When I think about being unreasonable, I think about a situation in which someone got badly injured. He wants to get back to playing as soon as possible because he has some important competitions coming up. In that case, he's more willing to take risks to get back to the level of performance he had before the injury. (L.05, 16 years, FG1)

Sportsmanship Orientation

The terms associated with this domain were 'dishonest', 'rule breaker', 'not respectful of others' and 'unfair'. Participants commented on these terms, focusing on the ideas of dishonesty and unfairness towards opponents as a key marker of doping users. It is interesting to note that adolescents argued that this not only demonstrates a lack of sportsmanship and respect for

others, but also a lack of respect for oneself. Doping is considered an unfair external aid in competition against others.

> [Doping] makes me think about the word 'unfair', especially when it comes to athletes who don't take these substances. (V.24, 19 years, FG4)

> In a competition, it's about showing respect to others, but also to yourself. If I win and I know it's because of the substance, it feels like I'm cheating. (S.02, 18 years, FG1)

> These days, young people want to be happy with themselves, they want to achieve results and be satisfied in doing it. If you know you've used those substances, you're not going to enjoy your win. You might say, "Yes, I won, so what?" (P.07, 14 years, FG2)

Doping use was condemned in competitive settings, but considered a matter of individual choice in non-competitive settings where it does not affect others or violate any established rule.

> It's about whether you play sport on your own or against other people. Even at the park, you play against others, and taking substances is a bad idea. If someone is practising or doing sport by themselves, I wouldn't say anything to them. The only thing I'd say is: "Make sure you're aware of the risks.". (M.19, 16 years, FG3)

Orientation Towards Competition

The terms associated with this domain were 'not self-confident', 'fears competition', and 'willing to win at all costs'. A participant described competition and the desire to excel as key drivers of doping use.

> I believe it is competition that drives people to substance use. It creates a need for comparison with others. These comparisons can lead to feelings of fear, distress and anxiety, which some people cope with by using substances. (S.04, 17 years, FG1)

According to the participants, attitudes towards competition among doping users are linked to insufficient confidence in their own abilities. From their perspective, doping represents a shortcut that athletes with low self-confidence take to keep up with the pressure to compete against others and the desire not to let down those around them. Over time, users may come to believe that they can only perform well if they consume the substance, leading to a vicious cycle in which their confidence in their abilities is further diminished.

> [A doping user] is someone who feels insecure about themselves and struggles to cope with pressure. They use these substances because they want to meet the expectations of others. (G.10, 15 years, FG2)

> They fear competition. If you're not worried about competing with others and you believe you're better than them, then you don't need these substances. It's only those who feel insecure and think they're not as good as others who take these substances to try to get ahead. (V.24, 19 years, FG4)

> The thing is, if you use illicit substances […], you start to think that you can't get good results without taking them. (D.12, 14 years, FG2)

Criticism was directed towards doping users for their fixation on winning competitions and receiving social rewards. It is worth noting, however, that there were some exceptions. Certain participants displayed leniency towards elite athletes whose obsessive drive could be seen as a manifestation of their passion for the sport, which was something that the participants admired.

> Some people don't care about sportsmanship. They're more interested in glory and showing others they're the best. (M.08, 14 years, FG2)

> It's about being obsessed with winning and being better than everyone else. (C.22, 19 years, FG4)

> For professionals, it's their passion for the sport that drives them to compete at such a high level. That's what can drive people to use drugs. (S.04, 17 years, FG1)

Artificiality

The terms used in this domain were 'fake' and 'artificial'. The meaning of this domain was highly debated and open to interpretation. Participants cited bodybuilders and American wrestlers as prototypes of artificially created athletes characterized by unrealistically large muscles. Metaphors comparing these individuals to tireless robots were also employed.

> This area makes me think about body builders. (J.11, 14 years, FG2)

> Wrestlers, I mean big people! (F.13, 15 years, FG2)

> It's like a robot that doesn't get tired. (C.22, 19 years, FG4)

According to the participants, the use of substances made these athletes appear fake and insincere. However, opinions varied and not all agreed that artificiality was an appropriate descriptor for those who use performance-enhancing drugs.

> Substances are generally paired with intense training because it is not enough to take drugs. I'd say he's a fake athlete because it's not just about his capabilities and skills. There's something external added in.. (G.03, 18 years, FG1)

> What's an artificially constructed athlete? I don't think there's any professional who doesn't take anything, by which I mean anything that's legal. Are they just as fake as the rest of them? I think it comes down to whether you're being fair or not, and whether you're doing things the right way or not. (M.21, 19 years, FG4)

During the discussion, participants also touched upon the concept of a 'natural' athlete, which is characterized as an individual who trains diligently and achieves their goals without the use of external aids.

> When I say "natural," I mean an athlete who trains regularly, follows a diet, and is comfortable with their body as it is. (I.09, 14 years, FG1)

Discussion

This study aims to provide detailed insights into the perceptions of male adolescents who engage in recreational sports regarding the prototype of a doping user. The prototype is based on four domains: approach to risk-taking, sportsmanship orientation, orientation towards competition, and artificiality. In contrast to Whitaker et al. (2012), no evidence was found for any perceived positive characteristics such as confidence, motivation, and commitment. However, there were largely overlapping negative connotations. Our study describes the prototypical amateur substance user as someone who exhibits a dysfunctional attitude towards competition. They are driven by the desire to be socially rewarded, disregarding the risks posed to their health. This is due to a lack of self-confidence and susceptibility to pressure associated with the fear of failure and the obsessive desire to prevail over others. All these aspects were paired with a disrespectful attitude towards opponents and sport rules. This prototypical individual is portrayed as insecure about his capabilities, reliant on substances, and likely to use doping to achieve results quickly. Many of these characteristics reflect well-known risk factors for substance use in sport, demonstrating adolescents' lay understanding of some of the drivers of such behaviour. Research and theories emphasise the importance of a competitive mindset characterised by achievement goals and a focus on immediate perceived benefits on performance, paired with the underestimation of harmful effects (Lazuras et al., 2017; Petróczi & Aidman, 2008). Moreover, research has shown that a motivational orientation that emphasises competitive performance and a fear of failure is associated with positive attitudes towards doping (Petróczi, 2007; Petróczi & Aidman, 2008), extrinsic motivations (Mudrak et al., 2018; Zucchetti et al., 2015), as well as moral disengagement (Girelli et al., 2020; Hodge et al., 2013; Lucidi et al., 2013), fear of failure, and lack of mastery (Barkoukis et al., 2020; Schirlin et al., 2009).

One significant finding is that the participants engaged in discourse surrounding the subject of doping from a moral standpoint, albeit in ways that were not initially anticipated. In accordance with the findings of Whitaker et al. (2012), the participants exhibited leniency towards the use of doping by professional athletes, justifying it as a manifestation of passion and commitment to the sport, or as a consequence of pressure from the athlete's entourage and the prevailing culture within the sport. This latter result is consistent with the existing literature on the role of the social environment surrounding the practice of sport (i.e., coaches, trainers, doctors) in influencing the likelihood of doping (Barkoukis et al., 2019). The participant of this study also distinguished between the acceptability of doping in competitive and non-competitive recreational settings for non-professional athletes. In non-competitive settings, such as the gym, where aesthetic motives prevail over performance and fair play rules do not apply, some individuals may view banned substances as a relatively acceptable means to achieve desired results. The acceptance of substance use can be interpreted as a form of moral disengagement (Kavussanu et al., 2016) which involves convincing oneself that "*ethical standards do not apply in a particular context, by suspending or deactivating the mechanism of self-condemnation and self-sanction*" (Girelli et al., 2020, p. 2). In non-competitive settings, doping was relegated to the private sphere and considered a matter of individual choice. However, this response does not acknowledge the health risks to individuals or the social influence processes that can trigger imitation of behaviour, particularly among young people. Therefore, it is important to consider these factors when discussing the issue of doping in sports. Research has shown that contact with doping users, such as in a gym, can reinforce favourable attitudes towards doping (Zucchetti et al., 2015). This result can be understood in light of the observation that the use of substances in recreational sports that involve competition is framed in a similar manner to that observed in elite sports (Christiansen et al., 2023). It can thus be argued that doping in non-competitive sport should be conceptualised differently, given that it is perceived as having a distinct meaning.

The identification of a prototype domain based on the natural-artificial dichotomy represents a novel finding that offers promising avenues for future research in this field. The present work does not address the issue of how the distinction between what is natural and what is artificial is represented in sports, as this has been a central topic in the debate on the increasing technologization of sports (Monasterio Astobiza, 2020). The distinction is multifaceted and vague, but the use of PAESs can be broadly understood as an unnatural and an 'artificial' method of performance or appearance en-

hancement that "challenges athlete responsibility and authenticity and thereby the ethical relevance of sport as a sphere of human excellence" (Loland, 2018) (p. 12). However, in our sample of adolescents, this antithesis was not only associated with the perception of substances as harmful or unethical, as described by antidoping policy (Miah, 2005). In contrast, the concept of naturality was linked to identity issues pertaining to authenticity and self-acceptance. One potential explanation for this discrepancy is that the adolescents in our study demonstrated less interest in the moral arguments against doping, perceiving them as less relevant to their experiences as recreational athletes. Instead, they exhibited a stronger inclination towards understanding the potential impact of substance use on their self-perception and identity formation. Identity formation is a pivotal process during adolescence (Erikson, 1968). Indeed, positive identity exploration has been demonstrated to have a protective effect on risk-taking behaviours (e.g., Dumas et al., 2012). In this study, identity concerns were expressed in relation to the use of external aids, such as artificial means, to achieve a desired physical appearance, such as unrealistically large muscles. In the participants' perspective, this illustrates a deficiency in self-acceptance of one's natural body and abilities. These findings are consistent with those of a previous study that identified identity concerns as a factor in the decision to refrain from illicit substance use (Lazuras et al., 2017). They can also be understood in light of self-affirmation theory (Steele, 1988). This theory postulates that individuals are attuned to information that may challenge their self-integrity with respect to their most cherished values and strengths. The findings of our study indicate that the perception of oneself as a natural human being represents a pivotal value for adolescent athletes.

Limitations

Although the current study has strengths, it also has several limitations that suggest avenues for future research. Firstly, the analyses were not based on a representative sample as only males were recruited. Although previous studies found no gender differences in prototype characteristics (Whitaker et al., 2012), future studies using samples from female adolescent athletes practising a variety of sports are needed to confirm and generalise the findings of this study. Secondly, it is possible that the participants' attitudes towards doping were influenced by social desirability bias. Future studies could investigate the impact of social desirability on the prototype's characteristics.

Implications For Practice

The following elements are of particular significance in relation to the knowledge produced by this research. It is the responsibility of educational agencies (families, coaches, schools, and Federations) to support young people by educating and training them not only on what doping is and what is considered illegal in sports practice, but also on a correct relationship with nutrition, technologies, and practices that influence sports performance (Isidori et al., 2020). Such educational agencies can thus be helped to become aware of their role as moral and educational agents, which is fundamental in anti-doping education and the prevention of all practices related to it. In light of the specific nature of PAESs use among young amateurs (FAIR, 2019), anti-doping education becomes a component of a broader discourse concerning education for prevention and health promotion in relevant settings for youth, including sport clubs and schools (Aresi et al., 2023; Isidori et al., 2022).

The findings of this study can be used to inform targeted interventions and awareness campaigns aimed at adolescents and stakeholders in amateur sports venues, aligning more closely with the perspectives of the target group on doping. The prototype dimensions include key adolescent issues, such as identity exploration, social comparison, and ethical standards. They can be incorporated into a preventive intervention to promote interest and engagement. Prototypes have various uses. Prototype manipulation, such as the typical exerciser and the typical non-exerciser, was found to increase exercise behaviour over a four-week interval for those with a high social comparison tendency (Ouellette et al., 2005). The contemplation of prototypes related to doping use might represent another fruitful strategy. Based on the prototype willingness model (PWM) (Gerrard et al., 2008; Gibbons et al., 1998), negative attributes of the user prototype could be discussed with adolescents in order to decrease favourability and encourage psychological distancing from the prototype, thus fostering the intention to avoid the substance.

Moreover, anti-doping initiatives can prompt adolescents to contemplate the ramifications of doping on their personal identity formation. The evidence base for self-affirmation preventive interventions across a range of health problems and behaviours is robust (Epton et al., 2015). However, in the context of doping use, these types of interventions have yielded mixed results (Barkoukis et al., 2023). The findings of this study can inform the development of targeted interventions for the adolescent population. They suggest that self-affirmation should be encouraged in relation to the impact of substance use on one's self-image (i.e., self-perception as a natural, not artificially enhanced individual) rather than in relation to one's perception

as a moral human being. It is also noteworthy that this approach may have beneficial implications in a number of other areas of life, including risky behaviours such as substance use (e.g., Aresi et al., 2023; Dumas et al., 2012).

Another domain that can be included in prevention and awareness efforts is coping with pressure in competitive or assessment situations. Adolescents today face challenges in managing anxiety during evaluative situations, such as sporting competitions (Petróczi & Aidman, 2008). While doping is one possible consequence of these difficulties, it can also provide opportunities to discuss broader social issues with adolescents and help them navigate these challenges. Sport can serve as an important training ground for developing anxiety and stress management skills.

Conclusions

The study provides a comprehensive description of the prototype of the adolescent doping user as described by adolescent recreational athletes. The findings can be incorporated into doping education efforts targeting this age cohort.

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APPENDICES

Document 1.

Methods of the Pilot study that Contributed to the Generation of the Pool of 39 Bipolar Adjectives to Describe an Adolescent Doping User

A qualitative pilot study was conducted with the objective of gaining a deeper comprehension of the perspectives held by Italian adolescents engaged in controlled and uncontrolled PAES within the context of recreational sports. A total of eight online focus group interviews were conducted with a total of 40 participants between June and October 2020. Participants were recruited through various channels, including direct referrals, referrals by coaches, and referrals by physical education teachers. In the case of participants under the age of 18, parental consent was a prerequisite for their participation. No financial compensation was provided for participation. Participants were required to be aged between 14 and 19 years old and to engage in recreational sporting activities at least once a week in order to be included in the study. Individuals who received any form of remuneration for their sporting activities were excluded from the study. Participants were invited to take part in the study using a maximum variability theoretical sampling strategy (Palinkas et al., 2015), with the aim of achieving variability in three key areas: age, gender and the primary sport practised. The study sample comprised a total of 40 participants. The sample comprised 40% female participants (N = 16) with a mean age of 16.7 years (SD = 1.54, range 14–19 years). The majority of participants were enrolled in secondary school (92.5%). The participants resided in four distinct Italian regions: northern (N = 17), central (N = 20) and southern (N = 3). The participants engaged in a total of 14 distinct sports, with football (28%), athletics (15%) and basketball (10%) representing the most prevalent. The remaining sports included water polo, tennis, fitness, swimming and gymnastics. Each focus group session was overseen by a researcher who had undergone training in qualitative research methods and had attained expertise in this field. A research assistant was present to record the proceedings in written form for subsequent analysis. The duration of each session was approximately 90 minutes, with each session comprising between four and six participants. The discussions were conducted in accordance with a standardised script, comprising broad questions and open-ended prompts. Following the spontaneous responses to the brainstorming session on doping, the participants were provided with a definition of controlled and uncontrolled PAES. Thereafter, the participants were prompted to deliberate

TABLE S1.
Descriptive Statistics of Bipolar Items.

Item	Semantic poles		Mean	SD
1*	Responsible	Irresponsible	4.42	1.14
2*	Willing to take risks	Not willing to take risks	4.05	1.43
3	Masculine	Not masculine	3.47	1.25
4	Feminine	Not feminine	3.40	1.25
5*	Reasonable	Unreasonable	4.38	1.02
6	Easy	Uptight	3.42	1.45
7	Open	Reserved	3.29	1.23
8*	Health-conscious	Not health-conscious	4.16	1.45
9	Able to have fun	Unable to have fun	3.95	1.23
10	Winner	Loser	3.84	1.49
11	Committed to perform	Not committed to perform	3.93	1.13
12	Attractive	Not attractive	3.57	1.36
13R	Thin	Fat	3.44	0.75
14	Muscular	Not muscular	3.44	1.11
15	Athletic	Not athletic	3.16	1.30
16R	Under pressure	Not under pressure	3.84	1.26
17	Strong	Weak	3.62	1.30
18	Fast	Slow	3.22	1.12
19*	Real	Fake	4.22	1.06
20*	Honest	Dishonest	4.41	1.02
21	Cool	Not cool	3.48	1.16
22	Trustworthy	Not trustworthy	4.00	1.12
23*	Natural	Artificial	4.20	1.05
24	Outgoing	Introverted	3.35	1.16
25	Motivated to succeed	Not motivated to succeed	3.06	1.41
26*	In control	Lacking control	4.07	1.06
27*	Respectful of rules	Rule breaker	4.45	1.00
28*	Respectful of others	Not respectful of others	4.14	1.11
29*	Self-confident	Not self-confident	4.05	1.16
30	Able to relax	Unable to relax	3.90	1.07
31	Good-humoured	Bad-tempered	3.67	1.04
32*	Does not fear competition	Fears competition	4.15	1.16
33*	Unwilling to win at all costs	Willing to win at all costs	4.10	1.35
34	Likes to try new things	Doesn't like to try new things	3.23	1.16
35	Excel in sport	Does not excel in sport	3.53	1.32
36	Rich	Poor	3.25	1.03
37	Popular	Not popular	3.19	1.28
38	Healthy	Sick	3.41	1.18
39*	Fair	Unfair	4.42	1.10

Note: *N* = 94; R = reversed item; *item retained.

on their attitudes, knowledge sources (e.g., media, club, school, etc.), and experience in discussing this topic with significant others (e.g., coaches, family members, peers). The participants were then prompted to consider potential scenarios that could lead to doping, as illustrated in the literature (Whitaker et al., 2012).

The interviews were recorded and subsequently transcribed in full. NVivo 11 was utilised as a tool to facilitate the management and analysis of the data. A thematic analysis of the transcripts was conducted in accordance with the procedures set forth by Braun and Clarke (2006); (Braun & Clarke, 2021). The initial coding was comprehensive, inclusive and aligned with the topic guide. Subsequently, the data were divided into sub-codes, and finally, the codes were grouped into common and discrepant themes.

TABLE S2.
Participants' Additional Illustrative Quotations by theme.

Subthemes	**Prototype Domains Exemplary Quotations**
Approach to risk taking	Young athletes may start doping because they don't know about the dangers. (S.02, 18 years, FG1) To me, someone who uses substances is not aware of the risks because if a qualified doctor told him about all the potential risks of taking that substance, he wouldn't take it. What you have is an athlete who wants to excel no matter what, and club staff around encouraging him to use some substances without being transparent about the risks involved. The athlete doesn't know who to trust. (M.21, 19 years, FG4)
Sportsmanship orientation	I agree that it's all about being a cheater. (C.22, 19 years, FG4) When competition is involved, there is a lack of respect for others and yourself. Take sports like bodybuilding or any physical activity you do just to improve your appearance. You're basically lying to yourself because you're getting results with little effort and too quickly. (L.05, 16 years, FG1)
Orientation toward competition	If you have low self-esteem, you're more likely to think you'll fail from the outset. It's only natural to look for alternative ways to achieve your goals. (L.15, 16 years, FG3) Using a substance can give you some sort of guarantee, a mental support that is helpful in certain circumstances. (S.04, 17 years, FG1) I'm talking about an athlete who is recovering from an injury or who is lacking in confidence in their abilities. So, he uses substances to improve his performance. (M.21, 19 years, FG4) I'm thinking about a person I know. He wasn't competing against anyone, and there weren't any doping rules. He did it because he was so focused on improving that he wanted to keep going. (M.19, 16 years, FG3)
Artificiality	A natural, genuine athlete is someone who puts in a lot of effort, gives it their all, and trains regularly. (A.14, 16 years, FG3) Participant: being natural means an athlete who is fair in sport. He has the right body for sport, meaning he can do sport, manage physical effort and bear the pain involved. Interviewer: 'You mean without using performance-enhancing drugs?' Participant: 'Yes, it's about using substances to enhance performance.' (M.08, 14 years, FG2).

Note: The quotations include the anonymous code and age of the participant, as well as the number of the focus group in which the participant took part.

Document 2.

Results of Exploratory Factor Analyses

We performed an Exploratory Factor Analyses (EFA) of the 14 selected items on the overall sample (N = 94). The extraction method employed was Principal Axis Factoring with Oblimin Rotation. Only one factor with Eigenvalue greater than one was extracted. The factor explained 56.1% of the variance (See Table S3).

TABLE S3
Factor Loadings of Items on the Pioneer Sample.

Prototype adjectives	**Factor loading**
Factor (56.1%)	
39. Unfair	.888
20. Dishonest	.882
27. Rule breaker	.840
23. Artificial	.816
28. Not respectful of others	.809
26. Lacking control	.799
19. Fake	.780
5. Unreasonable	.767
29. Not self-confident	.731
32. Fears competition	.690
8. Not health-conscious	.658
1. Irresponsible	.595
33. Willing to win at all costs	.350
2. Willing to take risks	.338

Note: N = 94

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