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Why Size matters; Rugby Union and Doping

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- (1) Sport
- (2) Anti-Doping
- (3) Qualitative interviews
- (4) Recreational athletes
- (5) Bigorexia
- (6) Masculinity

Abstract

Rugby Union is a sport where physical attributes such as strength, speed and power, are highly desirable. To this end, there have been suggestions that rugby players might use doping substances to fulfil these said demands. The present study comprises interviews with thirteen doped recreational Welsh Rugby Union players. The study examined: (i) perceived physical demands of rugby; (ii) motivations to lift weights and follow specific diets; and (iii) the motivating factors to use nutritional and doping substances. Participants detail novel insight into doping within recreational Welsh rugby and reaffirm the perception that size matters. Specific factors such as coach reinforcement, age group categories and level of competition, contribute to this perception. Notably, however, participants use/d doping substances for multiple reasons that were context-sensitive, each carrying different weight and influenced by temporal and developmental dimensions. Importantly, most players also referred to factors outside of rugby participation. These findings have important implications for the Welsh Rugby Union and National Anti-Doping Organisations. We recommend that the Welsh Rugby Union target these potentially doping-inducing perceptions, offering more non-elite focused education for both athletes and coaches, with a focus on safe and healthy weight and size gaining practices.

Highlights:

- Welsh Rugby Union players perceive size and muscularity are important
- Perceptions stem from performance related and societal factors
- Some athletes use doping substances to fulfil these perceived demands
- Acknowledgment of these factors should inform future Anti-Doping education
- The health of recreational athletes should be a primary focus
- Traditional understandings of doping ought to be re-evaluated

1. Introduction

According to UK Anti-Doping, Rugby Union is a sport that attracts a large percentage of Anti-Doping Rule Violations (ADRV) (UKAD, 2022). In consequence, anti-doping scholars have targeted this population for specific studies (Cox, Bloodworth & McNamee, 2021; Didymus & Backhouse, 2020; Whitaker & Backhouse, 2017; Backhouse et al., 2016; Till et al., 2016). While many sanctions during this period were issued to recreational level rugby players (UKAD, 2022), there was a dearth of research exploring the motivations behind such behaviors.

Backhouse et al., (2016) highlighted what is almost universally acknowledged within the sport of rugby, that too much emphasis has been placed by coaches on the weight and size of rugby players. Their study focuses on schoolboy rugby players within the English Rugby Football Union (RFU) and states: (i) schoolboy rugby union players experienced implicit and explicit pressures to be a certain size to guarantee team selection; (ii) that increased size and strength were deemed protective factors against potential harm from the physical demands of the game (iii) and that teachers/coaches were influential in the prevailing perceptions that ‘size matters’. Accordingly, this meant schoolboy rugby players were more likely to use protein supplements, spend more hours in the gym, have a greater drive for muscularity, and be more likely to take a risky substance. It is against this backdrop that we examine these perceptions further, specifically focusing on perceptions of size, strength and muscularity.

1.1 Rugby Union

Rugby Union is a contact sport that typically consists of two teams each fielding fifteen players. Players numbered one-to-eight are typically known as ‘forwards’ and nine-to-fifteen known as ‘backs’. Games last eighty minutes and are divided into two forty-minute halves. Forwards are usually taller and heavier than backs and are more likely to have a greater number of collisions (Paul et al., 2022; Roe et al., 2016). Indeed, evidence documents positive correlations between the collective weight and height of a team to success (Sedeaud et al., 2012). Some teams have, therefore, adopted this approach within team selection, with heavier, taller and more muscular players being selected over smaller, shorter and weaker

players (Lewis et al., 2015). This has driven perceptions related to ‘size matters’ and reinforced perceptions that schoolboy rugby players think they need to ‘bulk up’ (Backhouse et al., 2016). Consequently, some turn to muscle building supplements and anabolic androgenic steroids (AAS) (Backhouse et al., 2016; Till et al., 2016). Taken alongside existing evidence of doping within recreational level rugby union (UKAD, 2022; Cox et al., 2021; Whitaker et al., 2017), it is somewhat surprising that National Anti-Doping Organization’s (NADOs) prioritize elite and somewhat overlook recreational athletes within their educational efforts (Cox, Bloodworth & McNamee, 2022; Christiansen et al., 2020). As a consequence, this injustice likely exposes recreational athletes to greater doping vulnerability and risk.

While Backhouse and colleagues provide insightful evidence within their Report, the findings are limited to a population of English school level male rugby players, where few individuals had ever used doping substances. Moreover, shifting perceptions towards muscularity and body image within society (Christiansen, 2020; Edgar, 2016; Andreasson & Johansson, 2014; Pope et al., 2000) and the existence of masculinist cultures within rugby (Dalla Pria & Bonnet, 2022; Holland & Scourfield, 2019; Besnier et al., 2018; Darko, 2009; Pringle & Markula, 2005) are largely overlooked. In contrast, a small number of studies have exclusively examined doped rugby players (Didymus et al., 2020; Cox et al., 2021; Whitaker et al., 2017). Nevertheless, these investigations overlook the notion that ‘size matters’ and the potential association to doping likelihood.

1.2 Doping in elite and recreational Sport

Although not focused on rugby, a large body of literature has examined elite athletes’ motivations to dope (Backhouse et al. 2016; Blank et al. 2016; Ntoumanis et al. 2014; Bloodworth & McNamee, 2010). At an individual level, performance enhancement appears the most prominent motive, however, the desire to win, injury setbacks, financial rewards, retirement and team cultures are also commonly cited (Overbye, Knudsen & Pfister, 2013). Within recreational sport, the picture is less clear and doping motives are far more diverse (Cox, Bloodworth & McNamee, 2022; Christiansen et al., 2020). This is perhaps understandable considering the scale and heterogeneity of the population and the vast motivations for participation. To better understand doping, Backhouse et al. (2018) argues it is important to recognize doping beyond an individual level and grasp the complex array of factors (surroundings, opportunities and conditions) that contribute to doping. Collectively,

these factors are referred to, perhaps too strongly, as the ‘dopogenic environment’. Taken alongside the goal-oriented models of doping behaviour, such as the life-cycle model and the incremental model of doping behaviour (Petróczi & Aidman, 2008; Petróczi, 2013), we utilize the notion of ‘functional use’ of performance-enhancing substances to better understand doping within recreational Welsh Rugby Union. Whilst acknowledging the influence of the athlete’s environment, the central tenet of these models is a performance-related goal that drives the behaviour choices and outcome expectation that serves as the base for continuous evaluation of goal achievements. Although being similar in their goal-oriented focus, each model captures something unique which has relevance to the decision about and experiences with doping among recreational rugby players. It is the importance of outcome expectancy and the continuous goal setting – engagement - achievement evaluation – re-engagement or exit loop proposed in the life-cycle model (Petróczi & Aidman, 2008), and the recognition that doping is growing out from habitual engagement with a variety of performance-enhancing practices, including experimenting with nutritional supplements for performance-enhancement. The latter resonates well with Kandel’s (2002) gateway theory.

To address the concerns laid out within this introductory section, semi-structured interviews were conducted with thirteen doped recreational Welsh rugby players, that is to say, individuals using substances on the Prohibited List of the World Anti-Doping Agency (WADA, 2021). Interviews examined perceptions related to physical size, strength, muscularity and motivations behind the use of nutritional and doping substances. The rich accounts offered by our participants allowed for further interrogation of motivations for doping, and their relation to size, building upon existing literature in this field. The aim of this paper, therefore, is to bring nuanced empirical data to discussions concerning perceptions related to ‘size matters’ within rugby union, identify why this ought to be considered problematic and provide policy makers within national and international sport federations and anti-doping organizations (ADO), with a range of potential policy responses.

2. Methods

2.1 Participants

In total, the study interviewed thirteen Welsh Rugby Union players. All participants were male. Three played for semi-professional/championship teams, and ten played in divisions below this level. No player was an elite athlete – this meant no participant had a professional

contract during data collection. All thirteen athletes played for thirteen different rugby clubs within Wales. In terms of playing position, seven participants were “backs” and six were “forwards”. This is important given the different playing demands of these positions, with forwards typically bigger and heavier than backs. All participants were from the South Wales region and were aged between 25 - 40 years old at the time of the study. At the age of drug use onset, participants were aged between 16 - 27 years old. The mean age of drug onset was 21 years of age.

2.2 Data collection

The primary source of data collection was conducted through a purposeful sample method (Emmel, 2013). The first author had previously played rugby non-professionally but retired through injury. His time spent within a local rugby club meant that he was able to utilize old and existing contacts to share the details of this specific research investigation. The outline of the research investigation was also shared within rugby club group chats via the social media platform ‘WhatsApp’ and provided the contact details of the first researcher. After initial contact had been made with a doping athlete and they had been interviewed, the research team requested that participants shared the study details with potential interviewees. This data collection and recruitment technique is more commonly known as the snowball sample technique (Noy, 2008). Of course, recruitment of participants for a study such as this is notoriously difficult given that athletes are breaking anti-doping rules. If these individuals are caught using doping substances, they would likely face a sporting sanction between two-and four-years (WADA, 2021). Accordingly, recruitment was resource intensive: the first author had to follow a multitude of potential leads, spend considerable time developing rapport with potential interviewees, and was frequently let down last minute by individuals dropping out or simply not turning up to the interview. This arose often without explanation. The first author, following research ethical approval guidelines, respected the decision of these individuals and did not pursue these potential interviewees further. It seems reasonable to assume the contentiousness of the doping problem within sport but also society more generally, exaggerated these problems of access to the already restricted participant pool.

Prior to the interviews, participants were made aware that the interviews were being recorded and that the data could later be used within scientific journals. This was agreed with all participants prior to their participation within this study and confidentiality and anonymity was assured. This was important since Sport Wales (the quasi autonomous non-governmental

organization responsible for (most) sport at an elite and community level) was a sponsor of the research and share with other stakeholders, the responsibility to ensure doping-free sport in Wales. The maintenance of a boundary between the funders, who had anti-doping responsibilities, and the knowledge of doping processes and personnel was critical. Thus, to comply with research ethics approval, it was fundamental to protect the participants during and after this research. Despite using the first researchers contacts initially, the snowball method ensured a sample of athletes previously unknown to the researcher and from thirteen different rugby clubs in the region.

Interviews were semi-structured and included open-ended questions. Interview guides were constructed by the first and fourth author after the first author had conducted a literature review. The search focused on studies exploring doping motivations between 2009 – 2019 and included the following key words: *doping motives*, *doping motivations*, *doping intentions*. In order to provide greater specificity, the key word “rugby” was added which allowed the identification of particularly important studies (Backhouse et al., 2016; Till et al., 2016; Whitaker & Backhouse, 2017). Semi-structured interviews were conducted to gain a better understanding of personal experiences related to participation within rugby and the use of permissible and prohibited substances. Interviews lasted between 27 and 78 minutes and were conducted face-to-face, over the phone, or on skype with the first author as the interviewer. Interviews were recorded on tape devices and were later transcribed manually by the first author. The fourth author independently reviewed the transcribed data against the interview recordings to ensure methodological rigour. The investigation was approved by Swansea University Research Ethics Committee.

2.3 Data Analysis

The first author used the software programme NVivo 12 to code the interview data and assist in the identification of common themes. A thematic analysis was conducted to identify key themes within the data (Guest, MacQueen & Namey, 2011). This allowed the first author to group together common and reoccurring themes (Figure 1) associated with muscularity: (1) perceived physical demands; (2) coach reinforcement; (3) age group categories; (4) level of competition; and (5) societal factors.

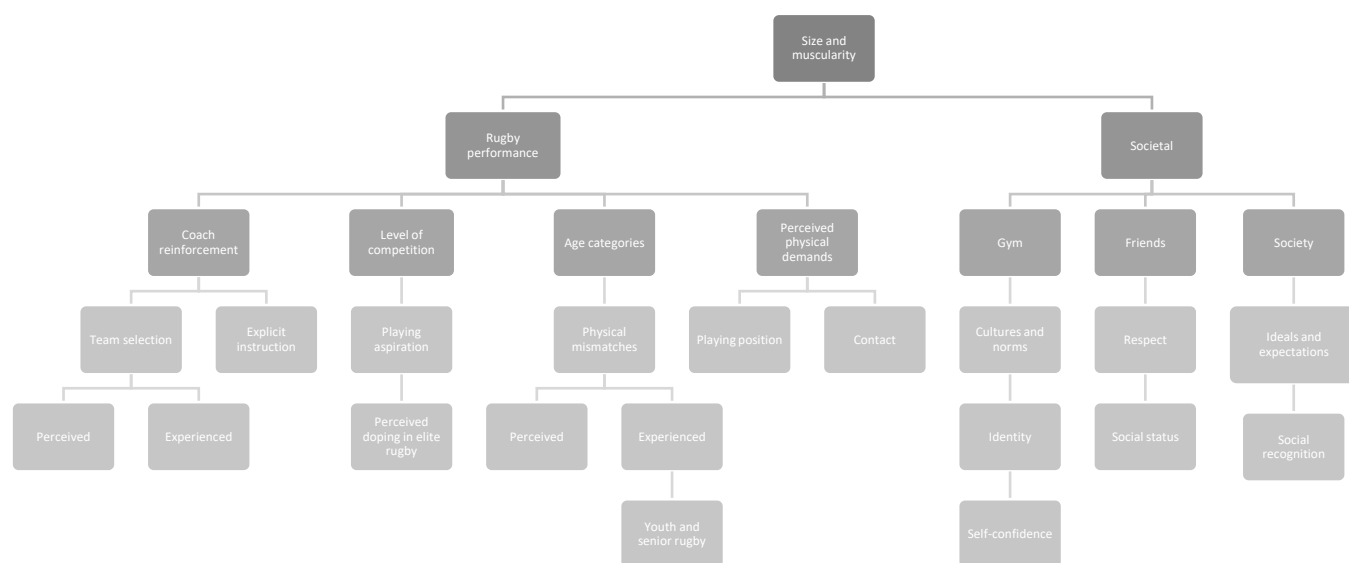


Figure 1. presents the different themes and sub-themes identified during the analysis.

The analysis of the data followed a grounded theory approach (Glaser & Strauss, 2017). The interview data guided the themes throughout the analysis. The fourth author examined the first authors coded data against the raw interview transcripts to ensure methodological rigour. It is also important to note and recognize the positionality of all four researchers. Given the well networked positionality of the research team, access to the study population was facilitated through the first named author. While the positions of the four researchers no doubt influenced both the questions asked and analysis of the data, the knowledge possessed by the researchers helped in developing rapport and in understanding the data. The first author was also careful to ensure the participant voice was fully heard during the interviews. This instantiated the ethical dimension of the methodology captured well by Chappell (2014: p.8): *'ethics is centrally about understanding the distinctive phenomenal contents of life's paradigm'*. Thus, the first author sought to understand participant behaviors in their entirety and reiterated the importance of context, detail and depth within their responses. All four authors contributed throughout the course of research design, data collection and analysis, to ensure scientific rigor.

3. Results and discussion

3.1 Perceived physical demands

During the interviews, most participants outlined the perceived need to be a specific size in order to play and remain competitive at that level of rugby, with the perception that *'bigger is better'* (P.12) evident. This finding is somewhat supported within current sport science literature, where younger players perceive the physical demands of rugby to contribute towards players wanting to 'bulk up' (Backhouse et al., 2016; Till et al., 2016). These perceptions perhaps stem from current strength and conditioning trends within rugby, where players have increased notably in physical size (height and muscularity), weight and strength in recent years (Lombard, et al., 2015; Sedeaud et al., 2012). It is therefore possible that recreational level rugby players adopt these beliefs, and focus their training goals on physical attributes such as size, strength and muscularity and use nutritional and doping substances to achieve them. Accepting this notion, we identify the first doping vulnerability risk factor as the perceived physical demands of rugby union.

Responding to the question whether rugby players need to be a particular size, participant (1), a forward, notes, *'Yes, you need to be big, especially being a prop, I'm 18 stone [114.3 kg] now'* (P.1). The perception that players needed to be heavier and more muscular rang true for most of the participants within our investigation. For some, these perceptions stemmed from the physical demands of rugby, with specific playing positions exaggerating perceptions further. Participants who identified as "“forwards”", typically numbered 1-8 on a team sheet (i.e., roster), noted greater perceived physical demands than participants who identified as "“backs”", typically numbered 9-15 – something also noted by Till, Scantlebury & Jones, (2017). This suggests that "“forwards”" are more likely to place emphasis on muscularity and strength due to their role or perceived game-related duties *as* "“forwards”". This orientation was not mirrored by the "“backs”". Indeed, the demands of the game mean that "“forwards”" will be involved in more contact and physical collisions than "“backs”" (Paul et al., 2022; Roe et al., 2016; Gabbett, King, Jenkins, 2008) and due to the collision-based nature of these positions, well developed physical characteristics are desirable for both performance and injury prevention (Owen et al., 2020; Read et al., 2018; Hislop et al., 2017). Thus, there exists a positional expectation that individuals playing within the forward positions (1-8) are taller, heavier and stronger than the back positions (9-15), to meet position specific demands of the

game (Darrall-Jones, Jones & Till, 2016; Durandt et al., 2006). The perceived positional demands are echoed by another forward:

‘Yeah, obviously when you play in certain positions, prop for example, you need to maintain a heavier weight. If you were lighter, you wouldn’t be able to keep up with the demands of the game’ (P.8).

Though we do not attempt to make more general claims about these findings, for over half of the participants within the current investigation, the perceived physical demands of rugby contributed to the final doping decision. Importantly, while doping is a universally used term, in reality the decision to dope is hugely variegated. In some cases, there is no decision to dope underpinning the bringing of an ADRV against an athlete (WADA, 2021: pp 168; 172). Children, for example, fall under WADAs protected person category (WADA, 2021: pp 174) and the inclusion into their diet of prohibited substances is not their choice; rather they are vulnerable to the decisions of others. Other cases of doping, which are the subject of the present study, can be intentional and sometimes strategic. Situating the final decision to dope is a complex affair mediated by many variables.

The notion of a ‘incremental’ model has previously been discussed to understand doping (Petróczi, 2013). For example, a rugby player might use the gym, follow specific diets and take nutritional supplements (behaviors) because they believe this will enable them to increase their weight, physical size and strength (expected outcome / motivation) to fulfill the perceived physical demands of the game (risk factor). For some, however, nutritional supplements fail to fulfill the expected outcomes, which - if the goal remains important but not yet achieved - can lead to reaching for doping substances to be used alone or in combination with nutritional supplements. This is best understood through participant (5):

‘I felt as though I hit a wall training and using supps [nutritional supplements]. It wasn’t as far as I could’ve gone naturally but the progress had slowed down. In the first year of training you make noticeable gains, you are going to. You have gone from doing nothing to doing something, you will make changes to your body. I made some of the most gains then, that’s normal I think because it’s a shock to the system, but after a couple of years your body becomes accustom to it and it all slows down, you plateau and I think that was when I decided to use these things’ [doping substances] (P.5).

The incremental, progressive nature of the use of performance-enhancing substances supports the ‘incremental’ model (Petróczi, 2013) as well as the ‘gateway’ hypothesis (Kandel, 2002),

which proposes that individuals seldom start on harder drugs without experimentation on lighter ones. Of course, this does not mean that those using lighter substances will progress to harder ones, but it does offer insight into the possible trajectories taken by individuals. Players who were satisfied with the outcomes they achieved by diet, training and perhaps other ergogenic aids, are not progressing to doping as long as their performance-related goals are achieved.

Our data is consistent with this context dependent, complex combination of factors and processes, where for most participants, the decision to dope was constructed through an array of different factors – some of which are highlighted within the subsequent sections of this paper. Naturally, some factors carry more or less weight, are liable to shift over time, and appear very specific to the individual. These factors form part of a broader web of influences and ought to be considered in combination with others, rather than alone. Moreover, it is difficult precisely to distinguish between the perceived physical demands of rugby, from the underlying western male societal trends associated to muscularity (Christiansen, 2020). This, evidently, highlights the complexities of doping-related behaviors, some of which might even stem from unconscious cultural norms and perceptions. The perceived physical demands of rugby, therefore, ought to be considered alongside, or in combination with, other factors to increase the likelihood of doping.

While the present study focuses on Rugby Union, positional expectations related to the physical demands (weight, strength, muscularity) of a sport, reach far beyond Rugby Union. Sports such as Rugby League, American Football and Basketball, all have specific positional expectations related to the weight and strength of players. Thus, the concerns documented within the current investigation bear relevance for those engaged in anti-doping education and compliance and could inform policy makers from similar sports. It is important to note that we are not suggesting that generalizations may be drawn to those sports from the present Rugby Union study, but rather that they may offer fruitful insight into the possible similarities and differences when strength and muscle mass are required in other power-based or contact of collision sports.

3.2 Coach reinforcement

The second theme to be identified as a potential risk factor within the doping decision was the influence of coaches. It has been suggested that coaches sometimes select players and put considerable emphasis on the physical size and weight of players in preference to other performance variables such as skill, game intelligence, and so forth (Lentin et al. 2021; Hill et al. 2018; Gabbet et al. 2013). This coaching disposition contributes towards, perhaps even drives, perceptions regarding the importance and even necessity of enhanced muscularity. This may go some of the way to explaining perceptions that size matters at various other levels of rugby not only within the current investigation.

Responding to the question where perceptions related to the need for increased muscularity stem from, participant (11) outlines:

‘You would get told to. So, I would put some on, then you might put a little too much on and get told to lose some, which you do, then you might get told again to put it back on, I was literally bouncing back and fore’ (P.11).

This response outlines that some coaches reinforced perceptions related to physical size and strength. Coach reinforcement is also reflected within the work of Till et al., (2016) who note that coaches contributed to perceptions that size matters through team selection. While we did not examine nor include coaches within the current investigation, it is feasible to suggest that muscles and size were an outcome of an over emphasis on these physical traits.

Participant (11) continues:

‘I got told to, because of rugby, I was told I needed to get stronger, so I tried to get a little stronger, then they would tell you that you needed to get fitter, so you would end up doing more of that’ (P.11).

With coaches explicitly telling players to get stronger and to put on weight, it is clear that coaches might drive perceptions related to physical size. In a multi-method study focusing on Welsh Rugby Union, Lewis et al., (2015) document that twenty-six coaches prefer bigger, faster and stronger players over younger and less physically mature individuals. Again, this might implicitly drive perceptions concerning physical size, strength and muscularity (by favoring bigger, taller, stronger and more muscular players over weaker, shorter and smaller players). A point that participant (12) reaffirms: ‘*the bigger boys always played, being bigger and stronger is better*’. Notably, however, our research found that, in some cases, coaches are explicitly telling individuals to get bigger and heavier. This is a novel finding and is

concerning when we consider that coaches appear to be reinforcing unrealistic or even unnecessary expectations related to weight-gain, that could be interpreted by some athletes to go and dope. Where emphasis is placed on strength and muscularity of players, this will influence perceptions and training priorities related to muscularity and drive individuals to consider the use of nutritional and prohibited substances. A similar response is echoed by another Welsh rugby player:

‘It was straight up coaches, they wanted a bigger second row or number 8, the average weight of one of them is between 18-20 odd stone [114.3- 127kg]. When I was with the higher-level stuff, semi-professional, they would give you dietary and training advice but with the other clubs they were just telling me to get on with it pretty much, get in the gym, get your supplements in, keep fit and healthy sort of thing, be ready to play on a Saturday’ (P.2).

Without question, coaches harbour the potential to reinforce norms through their team selection, favoring bigger and more muscular players. Their messages, whether implicit or even explicitly telling players to get bigger and stronger, can also reinforce doping behaviors. Furthermore, their instruction to use nutritional supplements as strategic performance enhancing aids might also contribute towards a doping mindset (Petróczi, 2013). Additionally, due to the power relation that exists between coaches and players, it is likely furthermore that players will adhere to their instruction and seek ways to put on weight and get stronger as a rational strategy. For example, players know that in most cases, coaches are the individuals who will make the decision whether the player will be selected to play or not. Due to the existence of these relations, it is possible that some athletes will be exposed to a greater degree of risk. While older individuals will likely be able to digest, analyze and navigate advice from coaches, less experienced and less successful individuals are more vulnerable to a greater degree of influence. In this sense, it is worth considering whether the explicit messages or implicit “signalling” that coaches convey around muscularity and size could disproportionately affect younger athletes, exposing them to greater doping vulnerability and risk. Notwithstanding this, we acknowledge that such “messages” or “signalling” may be considered a “green light” to older athletes considering doping, who might perceive they have less to lose at the end of their careers.

The severity of this point is exacerbated when we consider that recreational athletes are not provided with the same educational opportunities related to anti-doping as elite

athletes (Cox et al., 2022). Neither are they able to access the level of nutritional support that might enable safe weight gain. This is evidenced within an investigation into doping within recreational Welsh rugby, where over half the participants reported they had not received any formal anti-doping education (Cox et al., 2021) and is documented within the WRU Anti-Doping Protocol and Guidance document, where greater focus and emphasis is placed on elite athletes (WRU, 2021). This basic inequality means that recreational athletes will lack essential anti-doping knowledge when compared with elite athletes. Indeed, this exposes recreational athletes to greater vulnerability even when considering that the WADA Code is applied somewhat indifferently within both elite and recreational sport – concerns highlighted by Cox et al. (2022). It should be noted, however, that the inflation of anti-doping policy (ADP) to recreational athletes is open to a considerable interpretation when it comes to athlete sanctioning (Exner 2022), where some ADOs are more zealous than others (Henning & Dimeo, 2018; Henning, 2017; Henning & Dimeo, 2015).

Given the increased vulnerability of children, adolescents and recreational athletes, this point has import for good practice in the contexts of safeguarding. With coaches explicitly reaffirming the importance of physical size, muscularity and strength, one can question whether this was ‘code’ to dope. Without explicitly instructing athletes to dope, coaches nevertheless make it clear that this is what athletes have to do in order to “make it”. These cultural reinforcements are at odds to the anti-doping message and expose weaknesses within both ADP and practice. This point is further reinforced by Patterson, Duffy & Backhouse (2014), who write that coaches have played a role in encouraging and facilitating doping. Given that coaches are expected to uphold the anti-doping message, this is clearly an area for mixed messages. Within elite sport, where the anticipated consequences and benefits of competition(s) are more significant, one can readily comprehend why some coaches incentivise doping behaviours. At recreational levels, however, the picture is less clear. While recreational athletes will largely not receive any payment, coaches sometimes do. Moreover, both may be motivated by non-financial incentives to dope (Bloodworth & McNamee, 2010). Thus, to better understand this issue, future research should address the semi-(professional) coach to recreational athlete dynamic. Nonetheless, with previous studies describing doping cultures a direct threat to sporting integrity (Cox et al., 2021; Allen et al., 2017; Mazanov et al., 2014; Ohl et al., 2013), this allows us to consider the broader picture.

We argue that this provides policy makers with insight and scope to target potential future educational material. Indeed, Patterson & Backhouse (2018) previously argued that coach-focused anti-doping education is needed to ensure coaches take a more proactive role within anti-doping efforts. Accepting this point and taken alongside evidence that argues coaches play a vital role within anti-doping (Kim et al., 2011; Peters et al., 2009), we argue that these efforts ought to be extended to recreational sport.

3.3 Age group categories

Physical mis-matches within age group categories were another notable risk factor identified within the current investigation. These mismatches seemingly increased perceptions regarding physical size and strength – exposing some individuals to a greater degree of doping vulnerability and risk.

Welsh Rugby Union organize competitions by chronological age groups up until the age of eighteen. When players reach eighteen years of age, they may play men's senior rugby, which has no upper age limit. While Welsh Rugby Union is classified by chronological age, no consideration is made for "biological age". Biological age considers factors such as physical maturity, something that chronological age categorization overlooks (Owen et al., 2022; Howard et al., 2016; Lewis et al., 2015). In youth rugby, sixteen- and eighteen-year-olds may compete against one another (WRU, 2021) and while the chronological ages of players are shared in relatively narrow bands, biological age differences vary considerably (Lewis et al., 2015). Participant (2) outlined:

'I went straight to men's rugby after I left college and obviously being in that kind of environment, I needed to put weight on, they wanted me to put weight on as well and then when I started playing for [states rugby club name], division 3 rugby, it was a whole different ball game of rugby there. So, that was when I really started to try and put weight on' [...] 'To keep up with other guys, to get bigger, to get stronger, yeh just to keep up with the other guys I was playing with really. I had to be a lot bigger because I was playing up in a higher level of men's rugby at a younger age. I could see everyone getting bigger and stronger and I was just stuck at a point where I was using all the legal supplements but I wasn't getting any bigger' (P.2).

The final part of the quotation above aligns with the 'incremental' model (Petróczi, 2013), whereby participant (2) perceived that nutritional supplements were a requirement to increase muscle mass and strength. This, as Petróczi (2013) describes, is a learned behaviour, where

the use of external aids is seen as necessary to enhance performance, promoted and supported by extensive research from sport science and sport supplement industry. In addition to being accustomed to using a wide range of ergogenic aids for performance enhancement, for participant (2), the perceived physical mismatches between players were something identified as contributing to supplement use and thus, doping vulnerability. To further understand doping behaviours, the work of Backhouse et al., (2017) is worth drawing upon. Factors at the 'local level' (e.g., team, sports club, home, neighborhood and school) work alongside 'structural' (education, national and international sport organizations factors and societal attitudes and beliefs), contributing to the final doping decision (Backhouse et al., 2017). This is to say, multiple factors and at different levels likely contribute to an end behavior. While we identify one specific factor (perceived physical mis-matches) in this section, we ought not overlook additional factors also contributing to the final decision. Similarities within rugby player responses are evidenced below, whereby participant (4), echoes the response of participant (2):

'Maybe one of the more influential points was when I moved from age group rugby into the youth and senior levels. I found the size of players between age grade, under 16's, and youth rugby varied greatly. Within age grade you might have one or two larger players but moving into youth you had a lot more bigger guys and that was greater again at senior level. Being in and around these environments, I felt like I needed to be bigger to compete with the bigger guys' (P.4).

Rugby players moving between specific age categories is another point where perceptions and sensitivities related to size and muscularity are heightened. This is when younger, less physically developed players, mix with older, more physically developed players. Whether this physical mismatch is perceived or real, participants perceived they needed to be stronger, heavier and more muscular to combat these concerns. Moreover, due to the different rates of maturation in different individuals, some players develop and mature (much) earlier/later than others. Further insight is offer by participant (11) below:

'When I said the transition between under 16's rugby into youth rugby, the age gap is fairly noticeable and so is the physicality. You could be a young 16-year-old playing with an older 19-year-old. It shows and is daunting when you first make that step. When I made that step there was a huge aspect and emphasis put on that, being bigger'.

Accordingly, individuals who are much stronger, heavier and more muscular than others, will compete against one another, placing slower maturers, or simply smaller opponents, at risk.

The Welsh Rugby Union are not alone distinguishing players by chronological age categorization. The English Rugby Football Union (RFU) also take this approach:

“There is currently no research or evidence to suggest that altering Age Grade Rugby so that it is structured to banding by maturation or weight (i.e., bio-banding) would have any benefit in terms of injury prevention or player development.” (RFU, 2018).

While several NGBs have adopted age categorization as a way of grouping together players, other NGBs have taken a different approach. Bio-banding, an approach that groups together athletes based on maturation and physical attributes (Cumming et al., 2017) is elsewhere recognized as good practice. World Rugby (2020) have published guidance on categorization via weight and age, further supporting the proposal. By contrast, in New Zealand, youth rugby is categorized using both age and weight, where significantly heavier players can play at a more senior level and players considered underweight within their age category are permitted to play down an age grade (New Zealand Rugby, 2022)¹. While variation exists between districts, this approach grants greater flexibility and consideration for the different physical size of individuals. This is important considering the potential physical mismatches in rugby and the range of serious injuries said to be associated with these mismatches (Nutton et al., 2012). Similarly, Lentin et al. (2021) argues that the weight-grading model should be considered to limit mis-matches in anthropometric variables. This further supports our recommendation, responding directly to damaging beliefs and behaviors associated with muscularity within rugby.

Protection from injury appears to be the main premise within the categorization of players (weight versus age), however, we identify how physical mis-matches throughout age grade rugby reaffirmed perceptions of size and muscularity. Indeed, these perceptions contributed towards weight gain practices. Concerningly, for a small number of participants within the current investigation, physical mismatches within age group categories contributed to the final doping decision. This provides further insight into the progression towards the use of doping substances and is perhaps further supportive of the ‘incremental’ model (Petróczi,

¹ For more information on New Zealand Rugby banding <https://www.nzrugby.co.nz/assets/National-Rugby-Policy-Age-Bands.pdf>

2013). Of course, this is not to say that every player who perceives there to be physical mismatches will dope. We do, however, recognize the potential significance of this factor as identified by some participants within the context of the current study.

Considering the high rates of UKAD sanctions issued to Welsh rugby players (UKAD, 2022; Whitaker et al., 2017) and the notion that a small number of participants used doping substances due to these physical mismatches, we tentatively argue that the method of grouping players by physical maturation ought to be considered more generally, but especially with respect to Welsh contexts. Grouping by age and bio-banding are important themes to consider when attempting to understand perceptions of why size seems to matter, but consideration also must be made of the influence of the level of play.

3.4 Level of competition

The playing aspirations of the individual was another notable factor that contributed to the final doping decision amongst a small number of participants. Participant (3) summarized his position thus: *'I felt like I needed to be a certain shape to get a certain level'* (P.3). Evidence in sport science research confirms increases in strength, weight and muscularity of professional rugby players over the years (Sedeaud et al., 2012; Olds, 2001). Moreover, Jones et al. (2018) outline that an individual's physical qualities contribute to attaining a professional contract. Against this backdrop, it is clear to see where perceptions of size and muscularity stem from and why the playing aspirations of a player ought to be considered as a potential doping risk factor. Interestingly, Mills et al., (2017) note that non-elite players strongly believe they are inferior (when comparing weight, strength, speed) to their elite counterparts, something said to drive body dissatisfaction. Backhouse et al., (2016), also note that English school boy rugby players endorsed a similar perception.

Given the present digital-age, the growing popularity of rugby and the increased exposure given to imagery of professional rugby players and their bodies, formations of gender, body image and masculinity are said to have emerged (Dalla Pria et al., 2022; Pringle & Markula, 2005; Worth, Paris & Allen, 2002). With rugby central to the national identity of some countries (e.g., Fiji, Tonga and New Zealand (Holland et al., 2019; Mills & Giles, 2017; Pringle, 2008; Pringle, 2004)), it should come as no surprise that increased perceptions surrounding muscularity exist within specific communities. While most individuals will use the gym and make dietary adjustments to achieve these increased physical demands, others

sometimes seek prohibited and harmful methods in combination with conditioning work. For some, this provided a justification to dope, with the use of doping substances allowing these individuals to put on weight and increase their physical presence on the rugby field.

Participant (2) outlines:

‘To do well and keep up with these guys who were obviously using it [doping substances], you had to join in [dope]. The clubs didn’t put pressure on you, it was just one of those obvious things you had to do to step up’ (P.2).

This response parallels the work of Bloodworth et al. (2012) who note that talented young athletes perceive that without doping, they would not make it to a higher level within sport. Not only did participant (2) feel doping was a necessary behavior to play at a higher level but the perception that other rugby players were using doping substances provided moral justification for doping. Doping research into moral disengagement suggests that there is conditional endorsement of transgressional behavior (doping) (Boardley, Grix & Harkin, 2015; Boardley & Kavussanu, 2011; Bandura, 1991). Although the response of participant (2) is consistent with that position, the data does not more generally support a stronger link.

With that in mind, we argue that the concept of the ‘dopogenic’ environment (Backhouse et al., 2018) can help us understand the complexities behind doping behaviors, including environmental factors. For participant (2), the desire to play at a higher level and the perception that doping was common place within Welsh rugby were notable risk factors. As the participant saw it, the behavior (doping) appeared necessary to increase muscle size and strength (expected outcome of doping) to meet the perceived demands of rugby. Participant (2) provides further insight into his personal experience when using doping substances:

‘When I took these things [anabolic androgenic steroids], the gains were pretty incredible. I had more energy, I was waking up earlier, I felt like I had more energy in general. I was in the gym for longer, my muscles were throwing up the weights and I was way stronger on the pitch. I think in a 4- or 5-week cycle on the stuff, I gained about 12 pounds [5.4 kg] in weight. These things really helped me keep up with the guys I was playing with’.

Based upon his goals, to increase muscle size and strength (to remain competitive with other rugby players, to play a higher level of rugby, perceived widespread doping), participant (2), above, outlines positive experiences when using doping substances. These positive experiences stem from clear perceptions of both weight and strength increases, suggestive of

possible goal attainment. According to Petróczi et al. (2008), this mechanism would then likely repeat continually due to this positive feedback. If the feedback was negative, however, the individual would cease using doping substances. Although we identify playing ambition as a potential doping risk factor, it is of course true that it is not a key trigger point. Instead, the identification of this factor (quoted by a small number of participants within the current investigation), ought to be considered within a wider spectrum of factors that potentially expose athletes to greater doping vulnerability.

It was clear, nonetheless, that a significant number of participants expressed concerns that elite rugby players were using doping substances, '*I've heard rumours that stuff [doping] goes on at those higher levels*' (P.12), with another suggesting that doping was "rife". Indeed, these perceptions are damaging and potentially trickle-through recreational Welsh rugby communities, where close groups of friends come together, practice and socialize. Participant (8) states:

'Don't try to tell me that elite rugby players don't use PEDs [performance enhancing drugs]. Their speed, their size, the amount of big hits they give and take. It's not possible to stay that size and maintain those levels of fitness. The biggest guys used to last fifty minutes, now they last the full eighty. It's not possible' (P.8).

A similar response is echoed below:

'I also think a lot of rugby players use them, I know a few internationals who were a lot smaller growing up and disappear for a few years and come back really big. I wonder how that happens. You look at some of those guys playing international rugby and they put on a lot of size in less than 12 months. It's not natural' (P.3).

For some participants, these beliefs reinforce the perception that "size matters" and that the use of doping substances were required to make it to the professional level. These perceptions are perhaps supported with the high percentage of doping sanctions issued to rugby players (UKAD, 2022). Many of these sanctions, however, have been issued to recreational level rugby players (Whitaker et al., 2017). Thus, participant perceptions that doping is "rife" within all levels of Welsh rugby may have no objective correlate. Participant (7) shares a similar belief:

'I know it goes on at the elite level for sure. I've played with players who have played at much higher levels who have been told to take it and have been told to take it at age group levels as they are still progressing' (P.7).

Of course, these perceptions should worry both NADOs and NGBs. We suggest educational efforts ought to target and challenge these destructive perceptions. Rather interestingly, for players who fail to excel in rugby, evidence suggests these individuals are more likely to turn to weight training to increase size, gain respect and to earn their masculine status (Mills et al., 2017; Pringle et al., 2005). Considering the current study included recreational athletes (with some at the lowest levels of recreational Welsh rugby), it is possible that this argument holds true, with individuals from challenging socio-economic locations seeking muscularity to attain masculine status within societies that hold rugby as a central and defining feature of their identity and culture. This confirms with early literature documenting anabolic androgenic steroids (AAS) use in south Wales (Baker et al. 2008). We develop this point, the appreciation of broader societal influences on perceptions related to muscularity in the following section.

3.5 Societal influences

Most Welsh rugby players in our study perceived physicality to be important; size mattered to them. Notably, however, we also identified that most rugby players perceive increased muscularity desirable in terms of body image. Recognizing this point, we identify the final risk factor contributing to the doping decision as societal factors.

For participants who noted size matters in terms of body image, it was clear that increased muscularity enhanced perceptions of social recognition and self-confidence. Though these individuals played rugby and often recognised some of the performance advantages that increased muscularity facilitated, this was not their primary driving force. Noting this prioritization of motivation, within this final section, we consider some of these factors and examine what they mean for NGBs and ADOs. It is worth quoting participant (6) at length in this regard:

‘I think when I started to go to the gym and I think you can say this for a lot of rugby players, you start going to the gym because you want to perform better at rugby. And, the outcomes of going to the gym, getting stronger, putting on muscle, putting on weight, becoming more powerful, are all useful outcomes of the gym which translate very well to rugby performance. Going to the gym and playing rugby fit very well together, I don’t think you’ll find many players who haven’t been to the gym. Even at the lower levels, you don’t want to be shown up by others in training or a match day. Lifting weights and playing rugby go hand-in-hand. I started using the gym primarily to become a better rugby player, I didn’t think of anything else at the time, it was all I

wanted to do and all I wanted to be. I wanted to get stronger and faster and thought that using the gym to help me achieve that. But, you get addicted to the gym environment, it's competitive. It became more about the gym than it did the rugby. The more I trained and became involved in the gym environment, the more I was concerned with how my body looked, you simply get the gym bug. You want to get bigger; you want to get bigger than the guy next to you. You want to get stronger; you want to get stronger than the other guys training there and instead of focusing on rugby, you focus more on the weights and feel more like a bodybuilder, and it's happened to a few of my friends when you swap rugby for the gym, bodybuilding and powerlifting. You get the gym vibe' (P.6).

Literature documents the existence of deeply rooted masculine sub-cultures throughout rugby communities and within hardcore gym environments (Dalla Pria et al 2022; Christiansen, 2020; Holland et al., 2019; Besnier et al., 2018; Darko, 2009; Pringle et al., 2005; Klein, 1993). For participant (6), who was deeply embedded within both rugby and gym communities, it is clear that he was exposed to a set of norms and behaviors consistent across both sub-cultures. Not only was there competition on the rugby field to be the biggest and strongest but this competition was also evident within gym spaces. These environments, therefore, appear to drive perceptions associated with physical appearance and strength, with body image coming under great scrutiny and rewarded through the respect and recognition of others. Moreover, societal perceptions of masculinity have also shifted and is perhaps partly to blame for this increased concern and drive towards muscularity. Christiansen (2020) highlights bigger, leaner and more muscular bodies are now seemingly normalized. Accordingly, this has contributed towards and perhaps even shaped perceptions of what we consider 'masculine'. While participants are likely unaware of the underlying societal norms and trends, it is feasible to suggest that these factors underpin perceptions associated to size and muscularity.

Acknowledging that the societal prevalence of substance misuse is historically supported by scientific literature that documents the high rates of AAS use within South Wales (Baker et al., 2008; Baker et al., 2006; Grace et al., 2001), it is unsurprising then, that perceptions related to muscularity exist within the current rugby-specific investigation given that broader cultural norms and values have long been documented. The disposition towards muscularity drives motivations and behaviors that reinforce the perception. Participant (12) highlights this:

'I think it is a problem in South Wales. I'm not sure if that's still the case but it definitely was when I was playing. If you look at other places in the UK, I don't think they have the same kind of obsession with being bigger, I think South Wales in particular has a problem'.

This response provides some insight into the perceptions of body image and associated cultures and norms within South Wales. With Holland et al., (2019) arguing that rugby union is central to Welsh identity and the fact that it is still very popular in this geographical region, rugby cannot isolate itself from these broader social norms. Thus, perceptions of masculinity might stem from these increased muscular ideals within the region. Nevertheless, it is a moot point for policy development how public health organizations work alongside national governing bodies in terms of policy and practice.

For gym users unconcerned with the regulatory authority of the World Anti-Doping Code (hereafter: Code), the use of substances like AAS is permitted within the UK². Christiansen (2020) outlines how Danish males sometimes use AAS to build muscle to establish and/or enhance masculinity, shape personal identity and increase confidence. Wider literature also documents some of these perceived benefits of these drugs (see Latham et al., 2019; Kotzé & Antonopoulos, 2019; Vassallo & Olrich, 2010). Notably, however, for an athlete under the Code, elite or recreational level, the use of prohibited substances and methods within sport may have serious consequences (WADA, 2021). It is notable, therefore, that both of these athletic populations share gym spaces, some of which might be more or less prone to drug use. Indeed, some ‘hardcore’ gym facilities have deep-rooted and problematic subcultures embedded within those facilities (Christiansen, 2020; Klein, 2007; Klein, 1993) and illustrates broader social bonds connects individuals as part of wider subcultures. In anti-doping terms, this shared space is problematic since what is prohibited for one population may be prized and somewhat normalized by the other. From an anti-doping perspective, it appears essential to understand how exposure to these specific “permissive” cultures might increase doping vulnerability and risk.

Boardley, Grix and Harkin (2015) note individuals training in environments where performance enhancing drugs (PEDs) are being used can facilitate doping through diffusion of responsibility. Similarly, Backhouse et al., (2016) identifies ‘the gym’ as a risk environment for NADOs, where substance use is embedded within that social and cultural network. Furthermore, within some ‘hardcore’ gyms, the use of image and performance enhancing drugs (IPEDS) have become normalized (Bates & Backhouse, 2019; Van de Ven & Mulrooney,

² These substances are illegal in countries such as Denmark where regular gym users are subject to the same anti-doping regulations and testing as elite athletes and can be randomly tested

2017). Thus, it is easy to see how cultures and places of substance misuse merge with those (like rugby) that are ostensibly regulated by ADP. This has the consequence of destabilizing official doping-free spaces and inevitably blurs boundaries between the motivations to use nutritional and doping substances. Further societal factors are evidenced below:

‘Well, I was small compared to everyone else my age, I was much smaller, it was something I had noticed early on and something that bothered me when I was in school, that was the big drive, I wanted to get bigger, I wanted to get stronger’ (P.10).

Participant (10) draws upon the negative feelings he experienced during his younger years when he felt physically inferior compared to his peers. These emotions perhaps stem from the evidence suggestive that western societies have placed great emphasis on muscularity (Christiansen, 2020; Olivardia et al., 2004; McCreary & Sasse, 2000). Moreover, Klein (2007) highlights, ‘every man engages with some sort of dialogue with muscle’ and that ‘size matters when it comes to muscles’. Taken collectively, we can perhaps begin to better understand where the concerns of participant (10) stem from and why size and muscularity appear to be a prominent part of today’s society.

Accepting the societal significance of muscularity, it is also important to recognize the reports of body image dissatisfaction amongst men (McCabe & Ricciardelli, 2004; Olivardia et al., 2004; Pope et al., 2000). Christiansen (2020) suggests that media outlets (television, movies, reality shows, adverts and social media platforms) are partly responsible for showcasing unrealistic and sometimes enhanced bodies. With some men making physical comparisons to these images and thinking they are not sufficiently muscular; this is said to have contributed to body dissatisfaction. More specifically, the use social media – also said to be a location to source AAS (Cox, Gibbs & Turnock, 2023) - is said to drive body image concerns, motivating young men to make dietary adjustments and increase resistance training (Piatkowski et al., 2020; Griffiths et al., 2018). For some men, then, chasing these hyper muscular bodily ‘ideals’, the use of drugs such as AAS appear to be rational means (Kanayama, Hudson & Pope, 2020).

Participant (4) asserts:

‘I used them [anabolic steroids] to put on size and get bigger, I thought they would get me to look good, help me get noticed more and help me fit into social groups. I was probably trying to bridge insecurities that I had with myself and I saw them as a quick fix solution to problems I had with myself’ (P.4).

Concerns related to body image were reported in three quarters of the participants who took part in the current study. While the severity of dissatisfaction differed between responses, these participants were unmistakably unhappy with the way they looked. For most of these participants, the overriding desire was to be bigger, more muscular and leaner. Indeed, participant (4) wanted to be “bigger” and decided that doping substances would help facilitate that goal. Within the context of the current investigation, therefore, body image dissatisfaction is considered a doping risk factor.

Previously, Whitaker et al., (2017) claimed that “vanity” reasons drove some rugby players to dope. While this might be a true description of the motivations for some players, such as participant (7) who states: *‘When I used those [anabolic steroids] it was purely to look good, it wasn’t really rugby related, it was just to cut up for holidays’*, for others, the narcissistic label should be handled with caution. Durvasula & Lysonski (2008) define physical vanity as *‘the extent to which a person regards physical appearance as important’*. For some, therefore, the term will have negative connotations (e.g., showing off, excessive concern with image, attractiveness and desirability), however, our research documents factors that are more emotionally sensitive, more emotionally vulnerable, than the label “vanity” captures. The response of participant (9) evidences this: *‘My confidence was terrible, really bad. I would think people were talking about me, it wasn’t nice. I had no confidence whatsoever’* (P.9). Indeed, negativity associated with one’s appearance can drive psychological disorders (Pope et al., 2000) exposing individuals to greater vulnerability and perhaps doping risk. Thus, the application of this term within policy discussions ought to be addressed to ensure it captures a wider spectrum of motivating factors.

Given that sanctions are now applicable for anti-doping rule violations at the level of recreational sport (Cox et al., 2022; WADA, 2021) it is foreseeable that more athletes will experience complex emotional challenges that have been documented elsewhere. This raises the deeper question of whether the detect and punish approach to Anti-Doping is best suited to recreational athletes such as those in our study.

Limitations and future directions

Given the qualitative nature of this study, the limited number of participants and its exclusive focus on one sport in one country, the findings should be understood as a snapshot in time and place. No claim to generalizability is made. Nevertheless, this study offers novel insights

into the mindset and behaviors of a notoriously hard to reach population of athletes who have engaged in a socially ostracized behaviour via doping and been prepared to discuss them despite the shame that often surrounds them. To this end, our recommendations ought to be considered with these limitations in mind.

Conclusion

Like any sport, Rugby Union cannot separate itself from broader cultural norms where perceptions of size and muscularity are prevalent. Alongside those wider norms, we identified various factors within recreational Welsh rugby that contribute to perceptions of size and muscularity in relation to physical enhancement generally and doping more specifically. Collectively, these factors appear to intertwine and exacerbate perceptions that ‘size matters’. The widespread understanding of doping is as ‘performance enhancement using various prohibited substances’³. This common sense (mis)perception about the nature of doping needs to become more nuanced by empirical studies that draw out the many and varied associations athletes have with the concept, and the role that it plays in their athletic and non-athletic lives.

The present study was not conceived strictly within any research-theoretical perspective. Nevertheless, it resonates with several theories and proposed behavioral models for doping (e.g., the incremental model of doping behaviour, the life cycle model and the role of moral disengagement in doping) but ascribes to none in particular. As with all particular, theory-driven, research, paradigmatic commitments highlight certain aspects while forcing others into the shade. Given that all of the theories mentioned above offer some insight and explanation, we argue there is still a need to reconceptualize how doping behaviours are theorized above and beyond the level of data collection and analysis (Hauw and McNamee, 2017). Our participants often identified multiple context-sensitive factors, each carrying different weight and influenced by temporal and developmental dimensions. This underlines the complexities of understanding these behaviors. Whether or not the social scientific (anti) doping research communities will itself be prepared to debate the possibility of “normal

³ In contrast to common sense understandings we note, however, that from regulatory terms, of course, there is no definition of “doping” but that is tangential to our point (McNamee, M. J. (2015). *The spirit of sport and the world anti-doping code*. In *Routledge handbook of drugs and sport* (pp. 41-53). Routledge). In terms of the WADA Code, there is only the specification of 11 distinct Anti Doping Rule Violations WADA. (2021). *The World Anti-Doping Code*. <https://www.wada-ama.org/en/resources/world-anti-doping-program/world-anti-doping-code>

science” in Kuhn’s sense (Kuhn, 1962) in its theorization of doping is a moot point. Moreover, it may be the case that funding bodies will need to better understand the complexity of theory-method-data relationship in order to promote greater convergence of research “findings” in the field. Of course, it may also be the case that no such convergence is achievable, a result of which will be that the commensurability of qualitative doping data will remain problematic.

Accepting the more general limitations of qualitative research in doping, we argue that the factors in Figure 1 specifying why size seems indeed to matter in rugby, could increase doping vulnerability by disposing individuals to several harmful practices: (i) potential to influence dietary patterns; (ii) nutritional supplement use and; (iii) the use of doping substances. Thus, for participants within the current study, their participation within Welsh rugby appears to reinforce what might be termed “doping-friendly” as opposed to “dopogenic” norms. Accordingly, this should be a concern not only for ADOs, but also public health bodies. We recommend that additional and recreational-level specific educational sessions should be developed for athletes and coaches within rugby clubs, schools and college settings, enhancing awareness and facilitating safe and healthy weight gain practices. Moreover, researchers may need to re-evaluate common-sense understandings of doping, and enable coaches and administrators to recognize that heterogeneity of “messages” and “signals” that shape the contexts in which doping-related attitudes can be formed, whether implicitly or explicitly. We further recommend that challenges between anti-doping and public health domains are addressed. Dialogue could usefully focus on the way that these separate organizations can collectively protect the health of recreational athletes. Lastly, weight and height categorization ought to be considered to combat physical mismatches within youth rugby. This diminishes the latency and power of beliefs associated with size and muscularity, contributing to a reduction in the use of doping substances.

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