

Athletes' and coaches' perceptions of deterrents to performance enhancing drug use

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Abstract

Policies to prevent performance enhancing drug use in sport are implicitly based on a form of deterrence theory, whereby the threat of sanctions deters prohibited behaviour. While deterrents generally fail to deter serious criminal actions, criminological research suggests that deterrents can be effective with certain types of offences or offenders. This study explored the perceptions of elite athletes (n=488) and coaches (n=92) of two forms of deterrents to performance enhancing drug use (legal and material loss sanctions) and a range of other anti-doping policy issues. There were marked differences in the perceived deterrent effect for athletes and coaches, with coaches consistently seeing deterrents as less credible than athletes. Both groups endorsed sanctions for the coaches and clubs of doping athletes, and expressed support for the withdrawal of commercial and government sponsorship for such athletes. Findings are discussed in relation to the increasing focus of anti-doping campaigns towards elite coaches rather than athletes.

Keywords: doping, Australia, deterrence theory, sanctions

Athletes' and coaches' perceptions of deterrents to performance enhancing drug use¹

In 1999, the World Anti-Doping Agency (WADA) was created to assist in the international standardisation of anti-doping efforts. WADA then developed the first World Anti-Doping Code (WADA, 2003), which periodically undergoes revisions. The current edition (WADA, 2009) will be superseded by the third edition, scheduled for release in 2015 (WADA, 2013).

WADA's primary strategy has been to deter doping through the implementation of doping controls, which have grown over the years both in number and sophistication. In 2011 WADA laboratories analysed 243,193 biological samples (WADA, 2012). Adverse analytical findings were found in 1.2% of cases, a figure which includes athletes with 'therapeutic use exemptions'. Former WADA President Dick Pound acknowledged that the small number of athletes who are caught was an underestimation of the problem. Asked to estimate the true incidence of doping, Pound said: "It's north of 10 and short of 90 [%], but it's more than people expect"(Price, 2012, para. 19).

WADA's attempts to deter doping through the use of doping controls thus appear to have met with only limited success (Hanstad & Waddington, 2009), with some (Kayser & Broers, 2012; Kirkwood, 2009; Smith & Stewart, 2008) declaring such efforts to be an outright failure. There is certainly a considerable body of anecdotal evidence to support such views: doping controls typically only detect occasional or accidental users, whilst systematic doping, particularly the use of performance enhancing drugs, over many years (e.g., Lance Armstrong, Marion Jones) goes undetected.

WADA's anti-doping policy relies heavily on the deterrence value of doping controls (British Medical Association, 2002). It is assumed that if doping athletes *perceive* that there is a high likelihood of detection, and that there will be severe consequences, then they will be less likely to engage in any such behaviours. Logically, as the perceived likelihood of detection (e.g., more tests, better tests), or severity of consequences (e.g., larger fines, longer bans) increase, the deterrent effect is similarly increased.

In criminological research, this 'common sense' solution to controlling illegal behaviour is known as 'deterrence theory' (Matthews & Agnew, 2008; Paternoster, 2010), and as it is the premise that underpins the criminal justice systems in most countries, it has prompted a considerable body of research (Matthews & Agnew, 2008). This research shows that despite widespread popular acceptance, the theory has only limited empirical support (Hanstad & Waddington, 2009; Paternoster & Iovanni, 1986). In fact, the theory is now widely acknowledged as being largely 'wrong' (Pratt, Cullen, Blevins, Daigle, & Madensen, 2006). Proof of the failure of the theory is usually illustrated by reference to increasingly severe legal systems in countries such as the USA, where the number of people in prison (presumably a severe deterrent) or sentenced to be executed (an extremely severe deterrent) has had no discernible impact on offending (Chan & Oxley, 2004).

The apparent failure of WADA's deterrence strategy could easily be chalked up as an example of the failed utility of deterrence theory, although such a conclusion might be premature. In a meta-analysis of deterrence theory studies, Pratt et al. (2006) concluded that while deterrence theory typically failed to deter most forms of criminal behaviour (e.g., underage drinking, marijuana use, rape, domestic abuse), it did nevertheless have some utility for predicting 'white collar' types of offences, such as fraud and non-compliance with regulatory laws. The use of banned performance enhancing drugs is essentially a form of non-compliance with rules. It is also quite possibly a form of fraud (against other athletes,

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spectators, sponsors, etc.) in which an athlete fraudulently misrepresents their true ability by not competing 'clean' (McKenzie, 2007). Pratt et al. also suggest that deterrence theory appears to be most effective when non-legal sanctions are threatened. While there are legal sanctions on doping, there are also a wide range of non-legal sanctions, such as disapproval (from peers, family, spectators) and loss of income through suspensions or loss of sponsorships.

While there have been a large number of surveys of attitudes towards doping (see Morente-Sanchez and Zabala, 2013, for a recent review), only a handful of studies have examined attitudes towards doping policy, and in particular, the efficacy of deterrents to doping. In one study, Dunn, Thomas, Swift, Burns, and Mattick (2010), found that about three quarters of a sample of elite athletes agreed/strongly agreed that testing for banned substances was an effective way of deterring doping. However, Overbye, Knudsen, and Pfister (2013) found that while three quarters of their sample also saw anti-doping testing as a deterrent, only 40% believed that they would be selected for testing. In sum, athletes appear to see anti-doping testing as a deterrent, but that the certainty of detection is relatively low, thereby possibly invalidating the deterrence effect of doping controls.

Attempts to evaluate the efficacy of deterrence theory have been compounded by methodological issues, namely, how deterrence value is assessed. Generally speaking, deterrence value is calculated by assessing and combining respondents' perceived odds that a behaviour will be detected (certainty of detection), and respondents' perceived severity (impact of the sanction). However, researchers have not consistently used a combined index and many studies have used individual certainty or severity indices in isolation. These shortcomings notwithstanding, Pratt et al. (2006) go on to suggest that deterrence theory may be best thought of as a "mid-range" theory, that is, one that is only useful in specific circumstances, as opposed to a general theory that seeks to explain all types of offending.

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Given the centrality of deterrence in WADA's anti-doping policy initiatives, it is surprising to discover that there have been very few attempts to empirically assess the perceptions of athletes or other key stakeholders (such as coaches) towards the deterrent value of anti-doping controls. In probably the only significant study on this topic to date Strelan and Boeckmann (2006) surveyed 116 elite Australian footballers and soccer players. The athletes were asked to read and respond to a hypothetical scenario involving an athlete who sustains a serious knee injury, threatening their long term career in sport. A solution, in the form of human growth hormone (hGH: a banned substance), was then offered in order to help speed up the repair process. The athletes in the study then rated factors that might impact on their decision to use hGH. The authors report that drug testing controls had little influence on athletes' hypothetical drug use. Instead, personal moral beliefs and health concerns, mediated the relationship between drug testing and the decision to use hGH.

The current study

Understanding the views of athletes and coaches towards anti-doping deterrents is a necessary step in ensuring that those most affected by anti-doping legislation both understand and comply with that legislation (Mendoza, 2002). The present study seeks to assess the views of both athletes and coaches towards the deterrent value of anti-doping controls. It examines both the perceived certainty and severity of anti-doping controls, and assesses a range of policy options relating to sanctions.

Whilst it is athletes who are ultimately responsible for the decision to use banned performance enhancing drugs, there are a number of potentially significant referent groups who may play an important role in shaping such a decision. For elite adult athletes, the athlete's coach constitutes a central source of influence on the conduct of an athlete (Backhouse & McKenna, 2012). This may be through explicit instruction to use banned substances, or possibly through implicit suggestions, such as setting unrealistic goals for

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training or performance. Research (Aldhous, 2008) has shown that coaches can influence attitudes to doping: athletes who said their coaches frequently criticised them, punished them for mistakes, encouraged rivalries and gave unequal recognition to team-mates have the most favourable attitudes towards doping. However, Kirby, Moran, and Guerin (2011) found that the role of coaches in shaping doping attitudes and behaviors was relatively limited, suggesting instead that both personal characteristics and the attitudes of team mates might be more significant.

The present study will directly compare the perceptions of legal and material loss deterrents for banned performance enhancing drug use of both athletes and coaches. If there is any divergence in views this may present an opportunity, or a threat, to the implementation of credible deterrents to doping.

Method

Participants

Four hundred and eighty-eight elite athletes and 92 coaches from the state of Queensland, Australia participated. For the purposes of this study, 'elite' was defined as competing or coaching at state level or above. Mean age for athletes was 24.2 years ($SD=8.1$), and 37.8 years for coaches ($SD=13.68$); 387 (79.3%) athletes were male, 99 (20.3%) female (two participants did not specify); 70 (76.1%) coaches were male, 21 (22.8%) female (one did not specify).

Main sports represented (athletes and coaches combined) included Australian Football League (AFL; 15.1 % of participants), rugby league (16.1%), **soccer (14.9%)**; rugby union (9.9%); surf lifesaving (5.9%); cycling (3.4%); rowing (2.8%) and athletics (2.6%). Other sports, each represented by less than 2% of the sample, included: baseball, basketball, boxing, canoeing, cricket, hockey, ice hockey, ice skating, karate, netball, roller derby, rowing,

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softball, swimming, table tennis, taekwondo, tennis, touch football, triathlon, volleyball, water polo, weightlifting, and yachting.

Survey instrument

The survey instrument was pilot tested with a sample of 25 athletes and 5 coaches for clarity and ease of use. All key terms were defined, including the distinction between banned performance enhancing drugs and other substances such as illicit drugs. The assessment of deterrence theory typically comprises two parts: certainty and severity (Pratt et al., 2006). These data are then reported either individually or in an aggregated form, typically a calculation of certainty x severity.

The first part of the survey instrument (four questions) was adapted from the study by (Strelan & Boeckmann, 2006) which focussed on the impact of legal and material loss sanctions on attitudes towards a single type of performance enhancing drug: human growth hormone (hGH). In the current study the impact of legal and material loss sanctions was examined in relation to the much broader range of 'performance enhancing drugs' as a whole.

Deterrence: legal sanctions.

The *certainty of detection – legal sanctions* - item was “What do you think the chances are that the drug-testing authorities would catch an athlete who chooses to use performance enhancing drugs?” The corresponding *severity* item was “If an athlete were caught using performance enhancing drugs, how big an impact do you think the penalty would present for their sporting career?” Both questions were adapted from Strelan and Boeckmann (2006).

Deterrence: material loss.

The *certainty of detection - material loss* - item was “If the drug-testing authorities caught an athlete using performance enhancing drugs, what are the chances that this would affect his or her earning potential as an elite athlete?” The corresponding *severity* item was

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“What impact would getting caught using performance enhancing drugs have on an athlete's earning potential?” Once again, questions were adapted from Strelan and Boeckmann (2006).

All deterrence questions (certainty and severity) were rated on a scale from 0 to 10 where 0 indicated ‘no chance’ or ‘no impact’ and 10 indicated ‘total certainty’ or ‘maximum impact’ depending on the question asked.

Anti-doping policy.

Participants were asked to rate three statements on anti-doping policy. These questions were taken from those used in a study of public perceptions of anti-doping policy (Moston, Skinner, & Engelberg, 2012). In order to facilitate comparison with the current sample in the current study, no changes were made to these statements.

- The problem of performance enhancing drug use in sport is serious.
- Australia's anti-doping regime (which includes education, investigation and testing) is effective in deterring athletes from taking performance enhancing drugs.
- The use of performance enhancing drugs should be criminalised, with investigations conducted by police officers instead of sporting bodies.

Anti-doping penalties.

Participants were asked to rate two statements relating to whether coaches and clubs should be penalised if one of more of their athletes were found to use performance enhancing drugs. They were also asked to rate two statements suggesting that companies and the government should stop sponsorship of athletes who have been found to use banned performance enhancing drugs. Once again, questions were taken from a previous survey of public opinion (Moston et al., 2012).

Responsibility for doping.

Participants were asked to rate the extent to which athletes, coaches, clubs, the sport governing body, and the government (five items), should take responsibility for performance

enhancing drug use by athletes. Anti-doping policy, penalties and responsibility statements were all rated on five point scales from 'Strongly agree' to 'Strongly disagree'. Higher scores denote stronger disagreement.

Demographics.

Participants were also asked a series of demographic questions including: gender, age, main sport, highest level of competition (for coaches, highest level of competition of athletes coached), and history of anti-doping testing (for coaches, anti-doping testing of athletes coached).

Procedure

Recruiting participants into anti-doping research studies is fraught with numerous practical constraints, not least of which is an unwillingness to participate in a study that might portray a sport or team in a negative light. Consequently, some organisations and teams are unwilling to consider participating in such studies. Even when permission is granted, a variety of, largely discrete, non-compliance strategies can be employed (e.g., coaches instructing athletes not to participate).

Participants were recruited from elite sporting organisations and clubs. A list of all major sports (n=50) operating in the State of Queensland, Australia was sourced from the State Government. Representatives of 31 sports subsequently participated in the study (62% response rate). Two sports refused to participate and eight did not respond to the request for assistance (despite several attempts at communication, including emails, individually tailored letters to the head of the sporting organisation, and phone calls – the latter producing non-committal responses such as 'the matter would have to be put to the board').

Unfortunately, estimating the size of the potential sample population was not possible. State sporting organisations each employed different definitions and athlete recording

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strategies, making any attempt at estimating the number of elite athletes (even within individual sports) impossible.

The research team initially contacted the CEO/Manager of each organisation or team, requesting permission to distribute the survey. Once permission was granted, a variety of recruitment strategies were then employed. For organisations, such as State sporting bodies, an invitation to participate was sent via email. This invitation was sent by the sporting organisation directly and usually accompanied by a statement from the CEO encouraging participation in the research. The email included a link to an on-line version of the survey. For professional teams, a printed letter was distributed to athletes and coaches, followed some days later by face-to-face data collection, which was typically conducted at sporting venues prior to the start of training sessions. Anonymity and confidentiality were guaranteed regardless of preferred method of survey completion. For the face-to-face data collection the participants placed their completed surveys into an unmarked envelope, which was then placed into a sealed box.

Data analysis

Data from both the printed and the online surveys were coded and entered into a computer-based statistical software package SPSS (Statistical Package for Social Sciences, Version 20) for analysis.

Overall deterrence scores were calculated by multiplying the mean values for certainty and severity for each type of sanction respectively. This yielded two deterrence values (range from 0 to 100) one for legal sanctions and the other for material loss sanctions respectively. Athletes and coaches' certainty and severity mean scores and deterrence values were computed separately (see Table 1).

Ethics

Ethics approval for the conduct of the study was granted by the Human Research Ethics Board of Griffith University, Queensland.

Results

Data from the athletes and coaches were compared using a series of *t* tests to determine whether the means of the two groups were statistically different from each other. Preliminary analyses revealed that the demographic variables of age, gender and previous history of anti-doping testing, were not associated with different attitudes or opinions. Consequently, the following analyses focus on the differences between athletes and coaches.

A reliability analysis of the four certainty and severity questions revealed a high Cronbach's *alpha* of .81. This suggests that the deterrence items are highly inter-correlated (which is not surprising). Whilst it would be possible to collate the responses to the four deterrence items into a single scale, we have reported the data in accordance with standard practice in deterrence theory research (separate scores for certainty and severity, followed by a calculation of certainty x severity).

Deterrents to doping

The mean scores for certainty of legal sanctions were lower than for material loss sanctions for both athletes and coaches. However, mean severity scores were higher for legal sanctions than for material loss sanctions (see Table 1).

Overall deterrence scores (calculated by multiplying certainty x severity, with a possible range from 0 – 100) were generally clustered around the mid-point, with coaches expressing particularly skeptical views about the deterrent effect of legal sanctions (M=38.49). The highest deterrence rating was the threat of material loss amongst athletes (M=65.17).

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For both legal and material loss sanctions, there were statistically significant differences between the athletes and coaches across the dimensions of certainty and severity, as well as the overall deterrence rating (see Table 1). The coaches consistently saw the deterrence value of both forms of sanction as less effective than the athletes.

(Table 1)

Further examination of the deterrence data showed that the distribution of responses within each of the deterrence items contained some important additional information. For both certainty of legal and material loss sanctions, there were some athletes and coaches with particularly skeptical views: For certainty of legal sanctions (possible range from 0 – 10), 9.4% of athletes and 12.0% of coaches gave ratings of 2 or less; for certainty of material loss sanctions 2.5% of athletes and 1.1% of coaches gave ratings of 2 or less. Conversely, 33.8% of athletes and 18.4% of coaches gave a rating of 8 or higher for certainty of legal sanctions; for material loss sanctions, 66.1% of athletes and 54.4% of coaches gave certainty ratings of 8 or higher.

Perceptions of anti-doping policy.

There was generally strong endorsement of the statement that the problem of performance enhancing drug use in sport was serious: 76.6% of athletes and 73.9% of coaches ‘agreed or strongly agreed’ (see Table 2).

Views on the effectiveness of the current anti-doping regime were also moderately positive: 62.9% of athletes and 47.8% of coaches ‘agreed or strongly agreed’ (see Table 2).

Views on the criminalisation of doping were more ambivalent: 43.9% of athletes and 43.5% of coaches ‘agreed or strongly agreed’ (Means of 2.73 and 2.58 respectively).

There were no statistically significant differences in the responses of athletes and coaches on both the severity and criminalisation items. There was a significant difference

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between the groups on the evaluation of the anti-doping regime (coaches gave higher mean scores than athletes (see Table 2).

(Table 2)

Perceptions of anti-doping penalties

Somewhat surprisingly, coaches (47.8% agreement) were more likely than athletes (32.9% agreement) to endorse penalties for coaches when an athlete is found to have used performance enhancing drugs. This reflects a general pattern whereby coaches expressed harsher views on all forms of penalties than the athletes. There were statistically significant differences on all four penalty items; coaches expressed greater support for all penalties than the athletes (see Table 2).

Perceptions of the responsibility for doping

In terms of assigning responsibility for doping, both athletes (97.9%) and coaches (100.0%) shared the view that the athlete was responsible. However, athletes and coaches differed in degree to which they assigned responsibility to coaches, clubs, and sporting bodies. Coaches' consistently assigned greater responsibility to each of these groups (see Table 2).

Discussion

To date, policies to deter performance enhancing drug use have been based on strategies consistent with the tenets of deterrence theory. This approach has met with only limited success and the present results offer some insight as to why this may have been the case. First, the study showed that material loss sanctions (that is, the negative impact on earning potential) were perceived as more effective than legal deterrents (in this context, impact on career). In other words, the financial loss following from the detection of doping is more of a deterrent, than the career sanctions, which are the main focus of the current anti-

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doping deterrence strategy. Second, the perceived likelihood of detection was generally low. For legal sanctions, less than a fifth of coaches perceived the certainty of 'being caught by the drug testing authorities' to be 'high' (a value between 8 and 10); one third of athletes perceived certainty as high. For impact, over two thirds of athletes perceived that being caught as a performance enhancing drug user would have a high impact on their sporting career; just over half of the coaches perceived this impact as high. It thus appears that only a minority of athletes and coaches perceive the certainty of being caught as high, but if an athlete is caught, the majority of both athletes and coaches believe that the impact of the accompanying sanctions would be severe.

The results also include some potentially important differences in the views of the athletes and coaches. For both legal and material loss sanctions, coaches gave far lower ratings of both certainty and severity (and thus overall deterrence).

Taken together, the findings suggest that further initiatives or actions that attempt to deter drug use in athletes, should focus on policies or actions that serve to increase athletes' (and particularly coaches') perception that the certainty of being 'caught' would be high. In particular, the views of coaches are of great concern given their influence on athletes' behavioural choices with respect to drug use. Coaches might logically be described as more skeptical of the deterrent effect of the current sanctions and this skepticism might be communicated to athletes (either directly or indirectly) and thus undermine anti-doping campaigns.

An analysis of the remaining findings showed that more athletes than coaches believed that Australia's current anti-doping regime is effective. Less than half of coaches surveyed agreed or strongly disagreed with the statement that the current anti-doping regime is effective. There were no significant differences between athletes and coaches with regards to their perceptions of the seriousness of performance enhancing drug use in sport or whether

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doping should be criminalised. About three quarters of both athletes and coaches were in agreement that the problem was serious but less than half of the athletes and coaches respectively agreed that doping should be criminalised. There were also significant differences between athletes and coaches with respect to perceived responsibility for performance enhancing drug use; the majority of coaches (from just over half to two thirds) assigned responsibility to stakeholders such as coaches, clubs, and sport governing bodies, conversely, less than half of the athletes perceived the coach to be responsible, and only about a third of athletes viewed the club or the sport governing body as responsible for performance enhancing drug use by athletes.

Overall, the results suggest reasons for the apparent failure of anti-doping controls to deter doping centre on two factors: the type of sanction, and the perceived likelihood of detection. There are also some marked differences in perceptions between athletes and coaches. For example, coaches see both legal and material loss sanctions as less effective than do athletes; coaches are less in agreement about the effectiveness of the existing anti-doping regime; and coaches are more in favour of a variety of penalties not just to athletes, but to other stakeholders, for performance enhancing drug use.

The core message in anti-doping communications (doping athletes will be caught and punished) does not seem to work. Neither does the message about the detrimental effects to health (as Kirby et al. noted). Interestingly, the athletes in this study suggested more testing and stricter punishments as a way of increasing the credibility of deterrents. They also wanted to see punishments extended to those complicit in promoting or facilitating doping (i.e., coaches, support staff and suppliers).

Given the high costs of anti-doping controls (ASADA, 2012) and their publicly acknowledged low detection rate (Pound, Ayotte, Parkinson, Pengilly, & Ryan, 2013), there

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seems to be only limited scope for increasing the certainty of detection (at least, not through biological anti-doping testing). The new edition of the World Anti-Doping Code (WADA, 2013) reveals that WADA will focus its strategy on increasing the severity of legal sanctions, with mandatory bans of four years (rather than the current two year ban) for doping offences as one of the most striking aspects of the new Code. It should be noted here that this strategy appears to have been included as a direct result of the review by the WADA Foundation Board (which includes government ministers), whilst WADA's own Executive Board and stakeholders had reached a consensus favouring the relaxation of some anti-doping rules (Rumsby, 2013). The present study suggests that the Foundation Board of WADA are trying to reflect the wishes of their various national populations, which typically show strong support for severe anti-doping controls (Engelberg, Moston, & Skinner, 2012; Moston et al., 2012). Political expediency, rather than the development of a credible anti-doping strategy appears to be the prevailing force in the determination of anti-doping strategy.

The current anti-doping strategy has been further compromised by the possibility that doping athletes who are caught, but then cooperate with anti-doping authorities, will receive reduced bans and even be able to keep prize money won whilst competing with the assistance of performance enhancing drugs. Article 10.5.3 of the Code (WADA, 2013) enables an athlete to have up to 75% of their ban reduced if they provide substantial assistance to anti-doping authorities. After testing positive for use of performance enhancing drugs (specifically anabolic steroids), sprinter Tyson Gay's ban from competition was reduced to one year (Ingle, 2014). In comparison, an athlete who may have inadvertently doped, can expect to receive a much longer ban. In theory, under the new system of sanctions, an athlete who had been intentionally doping for several years might be able to evade any form of punishment, including the social stigma of being labelled a drug cheat, by naming other users and/or suppliers. That is, a doping athlete would receive full anonymity for cooperating with

authorities, with their sporting history unblemished and their income unaffected. Should a specific deal of this type become public knowledge, the potential damage to the integrity of the sport (and anti-doping authorities) would probably be considerable.

If anti-doping authorities are to make use of offenders who turn into informants, a large number of potential problems emerge. First, given that anti-doping testing is openly acknowledged as being an ineffective tool of detecting doping (Pound et al., 2013), the purpose of such ongoing testing is called into question. It may be that anti-doping controls are maintained, but largely to serve a symbolic public relations purpose.

Second, sporting organisations are almost totally unskilled in police-style investigative processes, including the interviewing of witnesses and suspects (Moston, Engelberg, & Skinner, 2013). One of the biggest problems in police investigations is that of false confessions (Kassin, 2005; Kassin & Gudjonsson, 2004). If a doping athlete is caught, and has names to trade, then the anti-doping cause may be furthered by acting on that evidence (doping athletes are duly identified and sanctioned). However, if an athlete is falsely accused of doping, or perhaps has inadvertently committed a doping violation, then a number of problems could arise. To begin with, any claims of innocence would probably be ignored. Forensic investigators often operate with a confirmatory bias that effectively assumes that no matter what an innocent person says or does when accused of an offence, their behaviour is interpreted as further evidence of their guilt (Kassin, Dror, & Kukucka, 2013). The innocent suspect is then offered incentives for their 'cooperation', which in all probability will mean that other innocent athletes will be falsely accused and punished. In many infamous cases involving false confessions, groups of innocent suspects have informed on each other, resulting in miscarriages of justice that took years to be uncovered (Gudjonsson & Pearse, 2011; Kassin et al., 2010). Obviously, many miscarriages of justice are never identified. In adopting a new police style investigatory system (WADA, 2011), anti-doping authorities, risk

creating a new set of problems that have the potential to greatly exceed the problems caused by the offence that investigators originally set out to investigate. This prospect may mean that athletes are not only deterred from doping, but also from practicing sport.

Limitations and future research

The current study features a large number of elite athletes and coaches from one state (and one country). Due to differences in definitions over what constitutes an 'elite athlete', and consequently who is considered to be the coach of an elite athlete, across the various sports represented, it is impossible to estimate the size of the populations from which these athletes and coaches are drawn. However, despite this limitation, the large number of participants (which included members of nearly every elite professional sport in the State and their respective coaches) suggests that the sample of athletes and coaches is in all probability highly representative. Further, this sample included athletes and coaches from both individual and team sports, and from a large variety of the most widely played sports. Given the paucity of research with samples of coaches (Backhouse & McKenna, 2012), the findings of this study, particularly with regards to coaches' perceptions, provides much needed empirical data on perceptions of anti-doping policies. Future research could ensure a representative sample by focussing on one or two sports only, such as team sports with objectively verifiable numbers of 'elite' athletes and coaches.

Another possible limitation of the research is that the responses given by both athletes and coaches reflects a social desirability bias, whereby stated opinions conform to a socially accepted norm. That is, athletes and coaches might state that they are opposed to doping, because such an attitude is expected of them, rather than because they are really opposed to doping. Research (Gucciardi, Jalleh, & Donovan, 2010; Petróczi, 2007) has shown that social desirability biases can impact on attitudes towards doping. While it is impossible to accurately determine whether any social desirability bias had an influence in the current

study, the largely critical assessments of the deterrence effect of anti-doping controls suggest that little such bias was present. Nevertheless, future research on anti-doping attitudes should attempt to control for social desirability bias, possibly by directly measuring social desirability (Knoll, 2013; Stober, 1999). In the present study the strict confidentiality and anonymity of responding will have helped to minimise any biases in responding.

Other suggestions for future research include broadening the sample to include other groups who might influence the decision to use performance enhancing drugs. This should include family members, doctors, and other support personnel see, for example Backhouse and McKenna (2011). In addition, given that performance enhancing drug use now appears to have become a 'mainstream' activity, the extent to which such use has penetrated into community sport, or to development level athletes, should also be examined.

Conclusion

The disparity between general acceptance of deterrence theory and empirical evidence leaves policy makers in a considerable quandary: a failure to offer credible deterrents might be perceived as weakness ('soft on drugs') and possibly even as an acceptance that an otherwise undesirable behaviour might even be condoned. However, any attempt to curb behaviour through sanctions is unlikely to succeed unless the deterrents are perceived as credible and effective. In Australia a report from the Australian Crime Commission (ACC, 2013), highlighting the links between organised crime and sport, spurred the Government to introduce a Bill giving anti-doping authorities new investigative powers. This included authority to compel witnesses to testify, a power that Australian police forces do not have in the conduct of their normal duties. The implications of this new Bill are self-evident: in Australia, the Government is attempting to increase the certainty of detection. Meanwhile, WADA remains committed to a strategy involving increasing the severity of punishments

following from detection. Together, the strategies may prove effective, but they cannot be realistically described as a coherent new anti-doping policy.

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References

- Aldhous, P. (2008). Inside the minds of athletes who cheat. *New Scientist*, 8-9.
- ASADA. (2012). 2011:12 Annual Report. Canberra, Australia: Australian Sports Anti-Doping Authority.
- Australian Crime Commission. (2013). Organised Crime and Drugs in Sport in Australia. Canberra: Australian Government.
- Backhouse, S.H., & McKenna, J. (2011). Doping in sport: a review of medical practitioners' knowledge, attitudes and beliefs. *The International Journal On Drug Policy*, 22(3), 198-202. doi: 10.1016/j.drugpo.2011.03.002
- Backhouse, S.H., & McKenna, J. (2012). Reviewing coaches' knowledge, attitudes and beliefs regarding doping in sport. *International Journal of Sports Science & Coaching*, 7(1), 167-175. doi: 10.1260/1747-9541.7.1.167
- British Medical Association, BMA. (2002). *Drugs in Sport: the Pressure to Win*. London: BMJ Books.
- Chan, J., & Oxley, D. (2004). The deterrent effect of capital punishment: A review of the research evidence *Crime and Justice Bulletin* (Vol. 84, pp. 1-24). Sydney: NSW Bureau of Crime Statistics and Research.
- Dunn, M., Thomas, J., Swift, W., Burns, L., & Mattick, R. . (2010). Drug testing in sport: The attitudes and experiences of elite athletes. *International Journal of Drug Policy*, 21, 330-332.
- Engelberg, T., Moston, S., & Skinner, J. (2012). Public perception of sport anti-doping policy in Australia. *Drugs: Education, Prevention & Policy*, 19(1), 84-87. doi: 10.3109/09687637.2011.590556
- Gucciardi, D.F., Jalleh, G., & Donovan, R.J. (2010). Does social desirability influence the relationship between doping attitudes and doping susceptibility in athletes? *Psychology of Sport and Exercise*, 11(6), 479-486. doi: 10.1016/j.psychsport.2010.06.002
- Gudjonsson, G.H., & Pearse, J. (2011). Suspect interviews and false confessions. *Current Directions in Psychological Science*, 20(1), 33-37.
- Hanstad, D., & Waddington, I. (2009). Sport, health and drugs: a critical re-examination of some key issues and problems. *Perspect Public Health*, 129(4), 174-182.

- Ingle, S. (2014, 5 May). Tyson Gay leniency shows amnesties for drug cheats will be hard to swallow, *the Guardian*. Retrieved from <http://www.theguardian.com/sport/blog/2014/may/04/tyson-gay-wada-drug-cheats-amnesty>
- Kassin, S.M. (2005). On the psychology of confessions. *American Psychologist*, 60, 215-229.
- Kassin, S.M., Drizin, S. A., Grisso, T., Gudjonsson, G. H., Leo, R. A., & Redlich, A. D. (2010). Police-Induced Confessions: Risk Factors and Recommendations. *Law & Human Behaviour*, 34, 3-38.
- Kassin, S.M., Dror, I.E., & Kukucka, J. (2013). The forensic confirmation bias: Problems, perspectives, and proposed solutions. *Journal of Applied Research in Memory and Cognition*, 2(1), 42-52. doi: 10.1016/j.jarmac.2013.01.001
- Kassin, S.M., & Gudjonsson, G.H. (2004). The psychology of confessions: A review of the literature and issues. *Psychological Science*, 5, 33-67.
- Kayser, B., & Broers, B. (2012). The Olympics and harm reduction? *Harm Reduction Journal*, 9. doi: 10.1186/1477-7517-9-33
- Kirby, K., Moran, A., & Guerin, S. (2011). A qualitative analysis of the experiences of elite athletes who have admitted to doping for performance enhancement. *International Journal of Sport Policy*, 3(2), 205-224.
- Kirkwood, K. (2009). Considering Harm Reduction as the Future of Doping Control Policy in International Sport. *Quest*, 61(2), 180-190.
- Knoll, B.R. (2013). Assessing the effect of social desirability on nativism attitude responses. *Social Science Research*, 42(6), 1587-1598. doi: 10.1016/j.ssresearch.2013.07.012
- Matthews, S.K., & Agnew, R. (2008). Extending deterrence theory: Do delinquent peers condition the relationship between perceptions of getting caught and offending? *Journal of Research in Crime and Delinquency*, 45(2), 91-118. doi: 10.1177/0022427807313702
- McKenzie, C. (2007). The use of criminal justice mechanisms to combat doping in sport. *Sports Law eJournal*, 1-9. <http://epublications.bond.edu.au/slej/4>
- Mendoza, J. (2002). The war on drugs in sport: A perspective from the front-line. *Clinical Journal of Sport Medicine*, 12(4), 254-258. doi: 10.1097/01.jsm.0000022724.57614.f2
- Morente-Sanchez, J., & Zabala, M. (2013). Doping in sport: a review of elite athletes' attitudes, beliefs, and knowledge. *Sports Med*, 43(6), 395-411. doi: 10.1007/s40279-013-0037-x
- Moston, S., Engelberg, T., & Skinner, J. (2013). Investigative interviewing and anti-doping developments in Australia. *Investigative Interviewing: Research and Practice*, 5(2), 144-149.
- Moston, S., Skinner, J., & Engelberg, T. (2012). Perceived incidence of drug use in Australian sport: A survey of public opinion. *Sport in Society*, 15(1), 64-77. doi: 10.1080/03031853.2011.625277
- Overbye, M., Knudsen, M.L., & Pfister, G. (2013). To dope or not to dope: Elite athletes' perceptions of doping deterrents and incentives. *Performance Enhancement & Health*, 2, 119-134. doi: dx.doi.org/10.1016/j.peh.2013.07.001
- Paternoster, R. (2010). How much do we really know about criminal deterrence? *Journal of Criminal Law & Criminology*, 100(3), 765-823.
- Paternoster, R., & Iovanni, L. (1986). The deterrent effect of perceived severity: a reexamination. *Social Forces*, 64(3), 751-777.
- Petróczi, A. (2007). Attitudes and doping: A structural equation analysis of the relationship between athletes' attitudes, sport orientation and doping behaviour. *Substance Abuse Treatment, Prevention, and Policy*, 2. doi: 10.1186/1747-597X-2-34

- Pound, R.W., Ayotte, C., Parkinson, A., Pengilly, A., & Ryan, A. (2013). *Report to WADA Executive Committee on Lack of Effectiveness of Testing Programs*. Montreal: WADA Retrieved from http://www.wada-ama.org/Documents/World_Anti-Doping_Program/Reports-Assessments/2013-05-12-Lack-of-effectiveness-of-testing-WG-Report-Final.pdf.
- Pratt, T.C., Cullen, F.T., Blevins, K.R., Daigle, L.E., & Madensen, T.D. (2006). The empirical status of deterrence theory: a meta-analysis. In F. T. Cullen, J. P. Wright & K. R. Blevins (Eds.), *Taking stock: the status of criminological theory*. (Vol. 15, pp. 367-395). Piscataway, NJ US: Transaction Publishers.
- Price, S.L. (2012, 10 August). A doping free Olympics? Not in London -- and maybe never., *Sports Illustrated*. Retrieved from http://sportsillustrated.cnn.com/2012/olympics/2012/writers/sl_price/08/10/2012-olympics-doping/index.html#ixzz2M3Jd4lc7
- Rumsby, B. (2013, November 4). British players' unions call in lawyers to fight Wada's 'barbaric' sanctions for recreational drug use, *The Telegraph*. Retrieved from <http://www.telegraph.co.uk/sport/othersports/drugsinsport/10426224/British-players-unions-call-in-lawyers-to-fight-Wadas-barbaric-sanctions-for-recreational-drug-use.html>
- Smith, A.C.T., & Stewart, B. (2008). Drug policy in sport: Hidden assumptions and inherent contradictions. *Drug and Alcohol Review*, 27(2), 123-129. doi: 10.1080/09595230701829355
- Stober, J. (1999). The Social Desirability Scale-17 (SDS17): Development and first results on reliability and validity. *Diagnostica*, 45, 173-177. doi: 10.1026//0012-1924.45.4.173
- Strelan, P., & Boeckmann, R.J. (2006). Why drug testing in elite sport does not work: Perceptual deterrence theory and the role of personal moral beliefs. *Journal of Applied Social Psychology*, 36(12), 2909-2934. doi: 10.1111/j.0021-9029.2006.00135.x
- WADA. (2003). *World Anti-Doping Code*. Montreal: WADA Retrieved from <http://www.wada-ama.org/>.
- WADA. (2009). *World Anti-Doping Code*. Montreal: WADA Retrieved from <http://www.wada-ama.org/>.
- WADA. (2011). *Guidelines for Coordinating Investigations and Sharing Anti-Doping Information and Evidence*. Montreal: WADA.
- WADA. (2012). *2011 Laboratory testing figures*. Montreal: WADA Retrieved from <http://www.wada-ama.org/Documents/Resources/Testing-Figures/WADA-2011-Laboratory-Testing-Figures.pdf>.
- WADA. (2013). *World Anti-Doping Code 2015*. Montreal: WADA Retrieved from <http://www.wada-ama.org/>.