Predicting attitude towards performance enhancing substance use: A comprehensive test of the Sport Drug Control Model with elite Australian athletes

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Abstract

Objective: This study presents a comprehensive examination of the Sport Drug Control Model via survey data of elite Australian athletes.

Design and method: A cross-sectional nationwide mail survey of 1,237 elite Australian athletes was conducted. Structural equation modeling was employed to test the model.

Results: Morality (personal moral stance on performance-enhancing substances use), reference group opinion (perceived moral stance of reference group on performance-enhancing substances use) and legitimacy (perceptions of the drug testing and appeals processes) evidenced significant relationships with attitude towards performance-enhancing substances use, which in turn was positively associated with doping behaviour. The model accounted for 81% and 13% of the variance in attitude towards performance-enhancing substances use and doping behaviour, respectively.

Conclusion: These findings validate the usefulness of the Sport Drug Control Model for understanding influences on performance-enhancing substances use. Nevertheless, there is a need to survey athletes representing a broader range of competition levels and cross-cultural research to test the model’s applicability to other populations of athletes.

Keywords: doping in sport, performance-enhancing substances
INTRODUCTION

There is limited application and empirical validation of doping models in sport. The lack of empirical evidence to support or refute these conceptual models leaves a significant gap in the literature in understanding influences on performance-enhancing substances (PES) use.

Donovan et al.'s Sport Drug Control Model (SDCM) was the first comprehensive published theoretical model of factors influencing PES use. The model consists of six components believed to predict an athlete’s attitudes and intentions towards PES use: (1) threat appraisal; (2) benefit appraisal; (3) personal morality; (4) reference group opinion; (5) legitimacy; and (6) personality. In addition, two 'market' factors believed to facilitate or inhibit the translation of attitudes and intentions into behaviour, the affordability and availability of PES, were included in the model (see Figure 1). Donovan later placed the model in two broader contexts: an overall sociocultural context (e.g., a ready acceptance of new technologies that save time and effort, prolong life, prevent suffering and enhance body image and cognitive functioning); and a sport culture that has become medicalised and commercialised. Similar to Donovan’s expansion, Stewart and Smith’s model of drug use in sport combines the micro orientation of individual athlete intentions with a macro orientation on sporting context and culture. The authors argue that decisions made by athletes are not always rational or bound by clear intentionality. Hence contextual factors may affect athletes’ values, beliefs, and decision making.

Strelan and Boeckmann’s Drugs in Sport Deterrence model postulates that the costs associated with PES use are weighed up against the benefits of using such substances, and this cost-benefit analysis is influenced by situational factors. There are no published data examining the utility of this model. However, Strelan and Boeckmann applied the principles of deterrence theory to hypothetical decisions to use a PES among a sample of 116 Australian footballers and soccer players.
Petróczí and Aidman’s life-cycle model of performance enhancement posits that in the course of their career, athletes constantly set goals and make choices regarding the way these goals can be achieved. Opportunities for behaviour change, including PES use, are presented throughout the cycle of choice – goal commitment – execution – feedback on goal attainment – goal evaluation/adjustment. The model is based on expectancy theory, hence athletes’ motivation to engage in PES use is assumed to be influenced by the desire to attain expected positive outcomes, and, at the same time, controlled by the expected undesirable outcomes from use of PES. There is no published empirical testing of this model, the difficulty of which is recognised by the authors: “Considering the complexity and reiterative nature of the model, empirical testing of the model as a whole is not feasible” (p. 7).

Mazanov and Huybers qualitative research provided support for the variables in these four models that are purported to influence PES use. Based on their findings, the authors presented a model of PES use in which 10 factors (‘choice’ determinants) thought to influence an athlete’s decision to use or abstain from PES use were grouped into four themes: (1) objective of PES use (expected performance and financial outcomes); (2) about the PES (sources of information and influence on decision to use PES; expected effects of PES use on health; (3) the deterrence system (likelihood of detection of PES use; likelihood of prosecution if caught using PES); and (4) consequences if prosecuted (expected financial and non-financial consequences). Further, three individual differences variables (termed ‘control’ variables) were included in the model: (1) decision-making style; (2) stage of career; and (3) type of sport.

Gucciardi, Jalleh and Donovan presented findings from an opportunistic examination of some of the constructs in the SDCM. Data were from a survey of 643 elite Australian athletes conducted for the purpose of personality profiling of elite athletes and their susceptibility to
Items in the questionnaire were identified that related to the following concepts in the model: threat appraisal (i.e., perceived likelihood of detection out-of-competition and while competing; successfully appealing a positive drug test); personality (i.e., self-esteem); legitimacy (i.e., perceived seriousness and effectiveness of the Australian Sports Anti-Doping Authority in preventing PES use; perceived security of the drug testing procedures in Australia); morality (i.e., cheating behaviour); benefit appraisal (i.e., perceived necessity for athletes to use PES to perform at the very highest levels); and reference group opinion (i.e., relevant others’ perceptions of them if they were caught using PES).

Structural equation modeling (SEM) revealed that the model accounted for 30% of the variance in attitude towards PES use. Morality, benefit appraisal and threat appraisal evidenced the strongest relationships with attitude towards PES use. Self-esteem, perceptions of legitimacy and reference group opinion showed small non-significant associations with attitude towards PES use. Despite the fact that the questionnaire items were not constructed to specifically measure the constructs, these findings provided preliminary support for the model and its usefulness in understanding influences on athletes’ attitude towards PES use. This paper presents the findings from a study that purposefully comprehensively examined the SDCM.

METHODS
The study design was a cross-sectional nationwide mail survey of elite Australian athletes conducted in 2004. Curtin University’s human ethics committee granted approval for this project. The five Australian Sport Institutes/Sport Academies, the Australian Sports Drug Agency (now the Australian Sports Anti-Doping Authority), and four national sporting organisations (Basketball Australia, Australian Football League, National Rugby League, Australian Rugby Union) were approached to distribute the survey to athletes on their databases. Only two Australian Sport Institutes/Academies declined to participate in the
study. Athletes were mailed a package containing the questionnaire, a Curtin University covering letter, a covering letter from their sporting organisation encouraging athletes to participate, and a Curtin University-addressed reply-paid envelope. Table 1 presents the questionnaire items that represented all of the constructs of the SDCM shown in Figure 1. The major dependent variables were doping behaviour (single item) and attitude towards PES use (two items). These are listed first in Table 1.

Of the 1,257 surveys returned (response rate: 26%), 1.6% were excluded due to non-responses to all of the items measuring the dependent variable (i.e., self-reported use of banned PES). In total, 1,237 cases were used in the analyses.

Following a basic descriptive and internal reliability analysis using SPSS, AMOS was employed to assess the model using SEM. Model fit was examined using chi-square statistics and several other indices for goodness-of-fit: root-mean-square residual (RMR); root-mean-square error of approximation (RMSEA) and 90% confidence intervals; goodness-of-fit index (GFI); adjusted goodness-of-fit index (AGFI); comparative fit index (CFI); Tucker-Lewis index (TLI); and incremental fit index (IFI).\textsuperscript{9} For CFI, TLI, IFI, GFI and AGFI values of 0.90 and 0.95 reflect acceptable and excellent fit to the data respectively. For the RMSEA and RMR, values of 0.05 or less indicate a good fit, and between 0.05 and 0.08 a moderate fit.\textsuperscript{9,10}

For each of the single indicator constructs in the structural equation model (i.e., personality, reference group opinion, availability and affordability of PES), Munck’s\textsuperscript{11} formula was used to calculate both the regression coefficients and measurement error variances. These values were used for the single indicator constructs in the structural equation model.

\textbf{RESULTS}
The sample included both male \((n = 603)\) and female athletes \((n = 612)\) (not specified: \(n = 22\)), with a mean age of 23 years \((SD = 7.8 \text{ years})\). Athletes were represented from a large number of sports, including athletics \((8.4\%)\), swimming \((7.8\%)\), hockey \((7.0\%)\), rowing \((6.3\%)\), soccer \((5.7\%)\), basketball \((4.7\%)\), netball \((4.1\%)\), cycling \((3.5\%)\), softball \((3.3\%)\), AFL \((3.3\%)\), and weight lifting/power lifting \((3.1\%)\). Of the total sample, 10.8% had participated in the Olympics/Paralympics, 46.3% at World Championship events, 37.1% at the national level and 5.0% at the state/regional level. The vast majority had competed in their sport for five or more years/seasons \((84\%)\) and 60% had attained an international \((38\%)\) or national title \((22\%)\).

Of the total sample, 6.9% reported ever using a banned substance (used in the last 12 months: 3.4%). Among those who had ever been drug tested \((n = 759)\), 1.1% reported testing positive for a banned PES.

Descriptive statistics and reliability estimates for the study variables are presented in Table 1. All of the composite variables (i.e., affordability and availability of PES; benefit appraisal: improving performance; threat appraisal: threat to health; personal morality: moral emotions; reference group; personality) showed adequate reliability with alpha coefficient values above the recommended minimum level of .70.\(^{12}\) Convergent validity was assessed by examining composite reliability (CR) and average variance extracted (AVE) from the composite variables. The CR values of the composite variables were between 0.84 and 0.94 and all are above the suggested minimum of 0.70.\(^{12}\) Their AVE values were all above 0.5, providing further evidence of convergent validity.\(^{13}\) Evaluation of normality indicated the presence of multivariate non-normality (Mardia’s index=58.76). Therefore, assessment of the structural equation model fit was evaluated using bootstrapping \(1,000\) bootstrap samples).\(^{10}\)
The results of the SEM analysis are summarised in Figure 2. With the exception of a significant Bollen–Stine \( \chi^2 \), which tends to become inflated with a large sample size, fit indices supported an acceptable fitting model \[ \chi^2(162)=653.6, p < .001, \text{Bollen–Stine} p = .001, \text{RMR}=.03, \text{GFI}=.95, \text{AGFI}=.93, \text{CFI}=.88, \text{IFI}=.88, \text{TLI}=.86, \text{RMSEA}=.050 \text{ (90\% CI=.046 to .054)} \] that accounted for 81\% and 13\% of the variance in attitude towards PES use and doping behaviour, respectively.

Examination of modification indices suggested that affordability be allowed to covary with availability. Given that affordability and availability of other substances use are commonly interrelated in terms of consumption,\cite{14,15} and were theorised by Donovan et al.\cite{1} to be interrelated in terms of PES use, the model was re-analysed with that change. The refitted model provided a good fit to the data. A significant Bollen-Stine index of fit was observed \( (\chi^2(161)=564.0, p < .001) \). All other indices of fit were satisfactory \[ \text{RMR}=.03, \text{GFI}=.96, \text{AGFI}=.94, \text{CFI}=.90, \text{IFI}=.90, \text{TLI}=.89, \text{RMSEA}=.045 \text{ (90\% CI=.041 to .049)} \].

The standardised parameter estimates indicate a significant and strong relationship between attitude towards PES use and personal morality (0.64), a significant and moderate relationship with legitimacy (0.25), and a significant but lesser relationship with reference group opinion (0.19). The moderate relationship between attitude towards PES use and benefit appraisal (0.40) approached significance \( (p = .091) \). In turn, PES use was significantly and moderately associated with attitude towards PES use (0.36). All other relationships were non-significant \( (p > .05) \).

**DISCUSSION**

In this study, 1.1\% of athletes who were drug tested reported testing positive for a banned PES. This is consistent with the proportion of samples analysed by the International Olympic Committee and World Anti-Doping Agency accredited anti-doping laboratories that resulted
in adverse analytical findings and atypical findings from 1993 to 2011 (ranged between 1.3% and 2.1%)\textsuperscript{16,17} Self-reported use of banned PES was 6.9%. This is within the range of self-reported use studies in adult athletes between 1980 and 1996 (5% to 15%)\textsuperscript{18} and similar to recent surveys of elite athletes.\textsuperscript{19,20} Hence we can be reasonably confident that our sample is representative of the population of athletes with respect to doping behaviour.

A favourable attitude towards PES use was associated with actual use of a banned substance thus providing support for past research reporting associations between attitude towards PES and actual use of these substances among US male college athletes\textsuperscript{21} and Australian athletes,\textsuperscript{8} as well as intentions to use these substances among Italian high school students\textsuperscript{22,23} and gym users in the Netherlands.\textsuperscript{24} The hypothesised relationships between availability and affordability of PES and the use of these substances were non-significant. However, this result was impacted by a substantial proportion of athletes reporting that they did not know whether the six presented substances were accessible or affordable: 47.3% to 61.8% and 58.6% to 69.8% for each substance respectively.

When considering the six hypothesised psychosocial variables together, personal morality revealed the strongest association with attitude towards PES use. That is, athletes with a weaker moral stance against PES use had a more favourable attitude towards PES use. Donovan et al.\textsuperscript{1} appears to have been the first published paper to highlight personal morality as an important component for understanding PES use in sport. In this study, personal morality was conceptualised and measured in terms of moral judgement towards PES use, and moral emotions experienced if caught using PES. Since the Donovan et al.\textsuperscript{1} paper, there have been no published studies on athletes’ moral judgement towards PES use and only the Strelan and Boeckmann\textsuperscript{5} study investigated moral emotions. In that study, guilt anticipated from use of human growth hormone was the strongest influence on Australian footballers and soccer players’ hypothetical decision not to use that substance. The Strelan and
Boeckmann’s study and this study provide support for the importance of moral emotions in influencing PES use.

In a sporting context, morality has been associated with the concept of cheating, with PES use viewed by athletes as the most serious form of cheating. In Donovan, Jalleh and Gucciardi’s study, acceptance of cheating as measured by the Attitudes to Moral Decision-Making in Youth Sport Questionnaire was significant in differentiating athletes according to low, moderate and high susceptibility to PES use. In Gucciardi, Jalleh and Donovan’s study, of the constructs examined, morality – measured in terms of cheating – evidenced the strongest relationship with attitude towards PES use. More recently there has been considerable interest in the construct of moral disengagement. For example, studies have found that moral disengagement is: significantly associated with intentions to use PES; positively associated with antisocial behaviour (e.g., trying to injure opponents and breaking the rules of the game); and negatively associated with prosocial behaviour (e.g., helping injured opponents and congratulating opponents for good play). These studies provide further support for the importance of morality in understanding PES use.

There was a significant relationship between perceived reference group opinion on the morality of PES use and attitude towards PES use. The direction of the association was the same as for personal morality, but the strength of the association was less. There are no published studies on the moral stance of athletes’ reference groups on PES use.

There was a significant moderate relationship between legitimacy and attitude towards PES use. The components of legitimacy tested were in relation to distributive justice (i.e., perceived fairness of the drug testing process) and procedural justice (i.e., perceived fairness of the appeals process). The data supported Donovan et al.’s theorising that if athletes perceive an anti-doping organisation’s drug enforcement regime to be fair and just, then the
legitimacy of the anti-doping organisation in conducting drug testing and prosecution is likely
to be enhanced and compliance with anti-doping regulations is more likely. This is a new and
promising dimension in understanding PES use.

The moderate relationships between attitude towards PES use and both threat and benefit
appraisals did not reach significance. This is contrary to the findings in Gucciardi, Jalleh and
Donovan’s8 study in which there was a significant moderate relationship between attitude
towards PES use and benefit appraisal, and a significant but small relationship with threat
appraisal. The inconsistencies in findings may well be due to variations in measurement of
these two constructs between the two studies. In this study, threat appraisal was
conceptualised and measured in terms of threats relating to both ill-health effects of PES use
and enforcement, while benefit appraisal was measured in terms of both rewards for
performing well in sport and perceived impact of PES on performance. In Gucciardi, Jalleh
and Donovan’s8 study, threat and benefit appraisals were measured only in terms of the
latter measure for each construct (i.e., appraisal of threat of enforcement, and perceived
impact of PES on performance).

In this study, personality was not a significant predictor of attitude towards PES use. This
finding is consistent with Gucciardi, Jalleh and Donovan’s8 study. It is noteworthy that both
studies were limited to a single measure of personality: risk taking propensity (this study) and
self-esteem (Gucciardi, Jalleh and Donovan’s7 study). In line with this study, Donovan, Jalleh
and Gucciardi26 found that risk taking propensity (measured by the Risk Propensity Scale30)
did not significantly differentiate athletes with respect to susceptibility to PES use.

The model accounted for a substantial proportion of the variance in attitude towards PES use
(81%) but only 13% of the variance in use of PES. Kraus’s31 meta-analysis of 88 attitude-
behaviour studies revealed that attitudes significantly and substantially predicted future
behaviour. However the reported mean correlation of 0.38 can be considered as a low-
moderate correlation. These data highlight the complexity of the attitude-behaviour
relationship and predicting behaviour per se. Notwithstanding attitude towards PES use,
there are a multitude of environmental and situational factors that may facilitate or inhibit
PES use. These constitute a rich area for further research.

The data analysis technique employed in this study (i.e., SEM) allows evaluation of the
hypothesised causal pathways. However, this study is limited by its cross-sectional design
which does not allow causal inferences about the direction of the various relationships in the
model. Longitudinal study designs are required to validate these cross-sectional findings and
make assertions about cause and effect relationships. Since the time of data collection for
this study, there have been published scales measuring some of the concepts in the SDCM,
mainly in relation to attitude towards PES use and personality. Future studies may
consider the use of these scales to provide a more comprehensive measure of these
constructs. However, consideration must be given to the additional length of the survey
instrument as the Performance Enhancement Attitude Scale consists of 17 items and
Donovan, Jalleh and Gucciardi’s study found that a number of personality variables
differentiated athletes with respect to susceptibility to PES use.

Research studies on moral disengagement in a sporting context have focused mainly on its
impact on antisocial and prosocial behaviours and attitude towards PES use, but none has
investigated its association with PES use. Given that personal morality is a significant factor
in understanding PES use, research examining and applying mechanisms to morally engage
athletes in relation to PES use warrants further investigation. Future studies could survey
athletes representing a broader range of competition levels and involving cross-cultural
research to test the model’s applicability and the relative importance and relevance of the
various constructs in other populations of athletes.
CONCLUSION

Current anti-doping education programs focus on building awareness and knowledge of banned PESs, reporting and testing requirements, and penalties for non-compliance. Such programs may include sporting values to assist athletes in resisting inclinations or invitations to use banned PES. However, this ‘education’ approach ignores psychosocial variables increasingly being found to be related to attitude towards PES use. The results of this study have a number of implications for anti-doping programs, and particularly with respect to two largely ignored areas: morality and legitimacy. This study’s findings suggest that in addition to educational components, anti-doping prevention may benefit from attention to morality and legitimacy issues that influence attitude towards PES use.

Practical implications

- This study comprehensively examined the Sport Drug Control Model via survey data of elite Australian athletes.
- These findings suggest that anti-doping education programs that include only education and information on banned PES, reporting and testing requirements, and penalties for non-compliance will have little impact on susceptible athletes’ propensity to use PES.
- Based on this study’s findings, anti-doping education programs would be more effective in influencing attitude towards and actual use of PES by including components discussing moral decision making behaviour, moral affect resulting from being caught using PES, the legitimacy base of the anti-doping organisation, the stringency of drug testing, and the equitable and fair treatment of all athletes in drug testing and appeals process for anti-doping rule violations.
Acknowledgments:
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References:


**Figure Legend:**

Fig. 1. The Sport Drug Control Model.¹

Fig. 2. Overview of results of structural equation model analysis (*n* = 1,237). *Note:* *p* < .01; **p** < .001; latent variable indicators are not shown for simplicity reasons.
Table 1: Descriptive statistics and internal reliability estimates for the variables measuring the constructs in the Sport Drug Control Model (N = 1,237)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Range</th>
<th>M</th>
<th>SD</th>
<th>α</th>
<th>CR</th>
<th>AVE</th>
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</thead>
<tbody>
<tr>
<td>Doping behaviour</td>
<td>(0) Self-reported never use of a PES to (1) self-reported ever use of a PES</td>
<td>.08</td>
<td>.27</td>
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<tr>
<td>Attitude towards PES use</td>
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<tr>
<td>Need to use banned PES to perform at the very highest level</td>
<td>(1) Definitely don’t have to use PES at some time to (4) definitely have to use PES at some time</td>
<td>1.52</td>
<td>.94</td>
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</tr>
<tr>
<td>Consideration of an offer to use PES</td>
<td>(1) None at all to (4) a lot of consideration</td>
<td>1.68</td>
<td>.93</td>
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<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Affordability of PES</td>
<td>(1) Very expensive to buy to (5) very cheap to buy</td>
<td>2.47</td>
<td>.79</td>
<td>.93</td>
<td>.94</td>
<td>.75</td>
</tr>
<tr>
<td>Availability of PES</td>
<td>(1) Probably impossible/very hard to buy to (5) very easy to buy</td>
<td>2.64</td>
<td>.81</td>
<td>.90</td>
<td>.93</td>
<td>.69</td>
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<tr>
<td>Benefit appraisal</td>
<td></td>
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<tr>
<td>Impact of PES on performance</td>
<td>(1) Definitely would not improve performance to (5) definitely would improve performance</td>
<td>3.23</td>
<td>1.04</td>
<td>.87</td>
<td>.90</td>
<td>.66</td>
</tr>
<tr>
<td>Rewards for performing well</td>
<td>(1) Little rewards to (5) a lot of rewards</td>
<td>3.79</td>
<td>.76</td>
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**Threat appraisal**

**Appraisal of threat to health:**

| Use of PES once or twice | (1) A lot of harm to (5) no harm | 2.34 | 1.03 | .91 | .93 | .69 |
| Regular use of PES | (1) A lot of harm to (5) no harm | 1.55 | .75 | .87 | .91 | .62 |

**Appraisal of threat of enforcement:**

| Deterrence in competition | (1) High threat of detection to (3) low threat of detection | 1.44 | .53 | --- | --- | --- |
| Deterrence out of competition | (1) High threat of detection to (3) low threat of detection | 1.63 | .56 | --- | --- | --- |

**Personal morality**

| Moral judgment on PES use | (1) PES use is morally wrong under any circumstances | 1.11 | .32 | --- | --- | --- |
| Moral emotions | (1) Moral emotions experienced to a great extent to (5) moral emotions not experienced at all | 1.06 | .29 | .80 | .88 | .71 |

**Reference group moral judgment on PES**

| (1) PES use is morally wrong under any circumstances | 1.16 | .38 | .74 | .84 | .51 |

**Legitimacy**

**Testing process:**

| Security of testing procedure | (1) Very secure to (4) not at all secure | 1.48 | .54 | --- | --- | --- |
### Equitable treatment of athletes

|                          | (1) Very fair to (4) very unfair | 1.68 | .66 | --- | --- | --- |

### Appeals process:

<table>
<thead>
<tr>
<th>Appeals process</th>
<th>(1) Very satisfied to (4) very dissatisfied</th>
<th>1.88</th>
<th>.60</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Fair hearing for positive test appeal</td>
<td></td>
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<td>Fair hearing before decision on sanctions</td>
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<tr>
<td>Fair hearing in Court of Arbitration</td>
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</tbody>
</table>

### Personality

| Personality       | (1) Risk adverse to (5) risk seeking | 3.60 | .85 | .75 | .86 | .75 |

Note: A full description of the measures and construct development is available elsewhere.
Supplement Table: Questionnaire items for the variables measuring the constructs in the Sport Drug Control Model

<table>
<thead>
<tr>
<th>Variables/Items</th>
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<tbody>
<tr>
<td><strong>Doping behaviour:</strong></td>
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<td>Which one of the following most applies to you?</td>
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<tr>
<td>(1) I have never considered using a banned PES; (2) At one stage I thought briefly about using a banned PES; (3) At one stage I thought quite a bit about using a banned PES; (4) I still think occasionally about using a banned PES because other athletes are using them; (5) I briefly used a banned PES in the past but no longer do so; (6) I occasionally use a banned PES now for specific purposes; (7) I regularly try or use banned PES.</td>
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<td>In the last 12 months, have you used any of the following, for whatever reason: anabolic steroids; beta-blockers; human growth hormones (hGH); diuretics; doping methods; alphabodies; designer steroids like tetrahydrogestrinone (THG); erythropoietin (EPO) and other similar substances?</td>
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<tr>
<td>(1) Have never used; (2) Did not use in the last 12 months; (3) 1 to 2 times; (4) 3 to 5 times; (5) 6 to 10 times; (6) More than 10 times.</td>
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<tr>
<td>Have you ever tested positive for a banned PES?</td>
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<tr>
<td>(1) Yes; (2) No.</td>
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</tbody>
</table>
**Attitude towards PES use:**

In your sport, how necessary do you believe it is for athletes to use banned PES at least at some time, to perform at the very highest levels?

(1) Definitely have to use banned PES at some time; (2) Probably have to use banned PES at some time; (3) Might or might not have to use banned PES at some time; (4) Probably don’t have to use banned PES at some time; (5) Definitely don’t have to use banned PES at some time.

If you were offered a banned PES under medical supervision at low or no financial cost and the banned PES could make a significant difference to your performance and was currently not detectable, how much consideration do you think you might give to the above offer?

(1) A lot of consideration; (2) Some consideration; (3) A little consideration; (4) None at all.

**Affordability of PES:**

How cheap or expensive would it be for you personally to buy each of the following types of substances: anabolic steroids; beta-blockers; human growth hormones (hGH); diuretics; designer steroids like tetrahydrogestrinone (THG); erythropoietin (EPO) and other similar substances?

(1) Very cheap; (2) Quite cheap; (3) Neither; (4) Quite expensive; (5) Very expensive; (6) Don’t know.

**Availability of PES:**

How easy or difficult would it be to get each of the following types of substances: anabolic steroids; beta-blockers; human growth
hormones (hGH); diuretics; designer steroids like tetrahydrogestrinone (THG); erythropoietin (EPO) and other similar substances?

(1) Probably impossible; (2) Very hard; (3) Fairly hard; (4) Fairly easy; (5) Very easy; (6) Don't know.

**Benefit appraisal:**

If you were to use the following, how likely is it that would improve your performance in your sport: anabolic steroids; beta-blockers; human growth hormones (hGH); designer steroids like tetrahydrogestrinone (THG); erythropoietin (EPO) and other similar substances?

(1) Definitely would not; (2) Probably would not; (3) Might or might not; (4) Probably would; (5) Definitely would; (6) Don't know.

What outcomes does your sport offer you if you perform well: national celebrity status; lucrative sponsorship deals; personal best achievements; opportunities for remaining in the sport as coach, trainer or administrator; future financial security; international celebrity status?

(1) A lot; (2) A little; (3) Not at all.

How much would you like these outcomes for performing well in your sport: national celebrity status; lucrative sponsorship deals; personal best achievements; opportunities for remaining in the sport as coach, trainer or administrator; future financial security; international celebrity status?

(1) A lot; (2) A little; (3) Not at all.

**Threat appraisal**
Appraisal of threat to health:

How much harm to your health, if any, do you think would be caused by using each of the following substances once or twice ever: anabolic steroids; beta-blockers; human growth hormones (hGH); diuretics; designer steroids like tetrahydrogestrinone (THG); erythropoietin (EPO) and other similar substances?

(1) No harm; (2) A little harm; (3) Some harm; (4) A lot of harm; (5) Don’t know.

How much harm to your health, if any, do you think would be caused by using each of the following substances regularly: anabolic steroids; beta-blockers; human growth hormones (hGH); diuretics; designer steroids like tetrahydrogestrinone (THG); erythropoietin (EPO) and other similar substances?

(1) No harm; (2) A little harm; (3) Some harm; (4) A lot of harm; (5) Don’t know.

Appraisal of threat of enforcement:

How likely is it that athletes at your level would be drug tested at least once a year: out of competition; in competition?

(1) Very likely; (2) Quite likely; (3) A little likely; (4) Not likely; (5) Not at all likely.

From what you know or have heard, if you were to take banned performance enhancing substances (out of competition)/(while competing), how likely do you think that you could get away with it if you really tried to?
From what you know or have heard, how likely is it for an athlete to successfully appeal a penalty for a positive drug test in your sport?

(1) Very likely; (2) Quite likely; (3) A little likely; (4) Not likely; (5) Not at all likely.

Deterrence in competition

Deterrence out of competition

**Personal morality:**

Regardless of whether you believe performance enhancing substances should be banned or allowed, which of the following statements best describes your personal feelings about deliberately using banned performance enhancing substances?

(1) I believe deliberately using banned PES to improve performance is morally wrong under any circumstances; (2) I believe deliberately using banned PES to improve performance is morally OK under some circumstances, but wrong under others; (3) I believe deliberately using banned PES to improve performance is morally OK under any circumstances.

If you were caught using banned performance enhancing substances, to what extent would you experience the following feelings: ashamed; embarrassed; guilty?

(1) Not at all to (5) To a great extent.

**Reference group:**
People involved in sports in general:

What about the following people’s feelings about using banned PES: most other athletes, most spectators, most of the general public, sports lawyers in general, sports journalists in general?

(1) Deliberately using banned PES to improve performance is morally wrong under any circumstances; (2) Deliberately using banned PES to improve performance is morally OK under some circumstances, but wrong under others; (3) Deliberately using banned PES to improve performance is morally OK under any circumstances.

Legitimacy:

Testing process:

Security of testing procedure:

How secure is the Australian Sports Drug Agency’s drug testing procedures in Australia? (That is, in taking of samples and care of samples).

(1) Very secure; (2) Quite secure; (3) Not really secure; (4) Not at all secure.

Equitable treatment of athletes:

How fair is the Australian Sports Drug Agency in terms of treating all athletes equally?

(1) Very fair; (2) Fair; (3) Unfair; (4) Very unfair.
**Appeals process:**

How satisfied are you that athletes who appeal a positive test in Australia will be given a fair hearing?

(1) Very satisfied; (2) Somewhat satisfied; (3) Somewhat dissatisfied; (4) Very dissatisfied.

How satisfied are you that athletes who test positive in your sport will be given a fair hearing before a decision is made about applying a penalty?

(1) Very satisfied; (2) Somewhat satisfied; (3) Somewhat dissatisfied; (4) Very dissatisfied.

How satisfied are you that athletes who appeal a positive test before the Court of Arbitration in Sport, will be given a fair hearing?

(1) Very satisfied; (2) Somewhat satisfied; (3) Somewhat dissatisfied; (4) Very dissatisfied.

**Personality:**

Please indicate whether you agree or disagree, or have mixed feelings with it: I am the kind of person who avoids risk; I am the kind of person who enjoys risk?

(1) Strongly agree; (2) Agree; (3) No feelings/mixed feelings; (4) Disagree; (5) Strongly disagree.