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6 Ego Involvement Increases Doping Likelihood

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1   Abstract

2   Achievement goal theory (Nicolls, 1989) provides a framework to help understand how

3   individuals behave in achievement contexts, such as sport. Evidence concerning the role of

4   motivation in the decision to use banned performance enhancing substances (i.e., doping) is

5   equivocal on this issue. The extant literature shows that dispositional goal orientation has

6   been weakly and inconsistently associated with doping intention and doping use. It is

7   possible that goal involvement, which describes the situational motivation state, is a stronger

8   determinant of doping intention. Accordingly, the current study used an experimental design

9   to examine the effects of goal involvement, manipulated using direct instructions and

10   reflective writing, on doping likelihood in hypothetical scenarios in college athletes. The ego-

11   involving goal increased doping likelihood compared to a control no goal and a task-

12   involving goal. The present findings provide the first evidence that ego goal involvement can

13   facilitate the decision to use doping to improve athletic performance.

14

15   Keywords: achievement goals; cheating; doping; motivation.

16

1   **Ego Involvement Increases Doping Likelihood**

2   Doping – the use of banned performance enhancing substances and methods by athletes

3   (WADA, 2015) – is an important (Mazanov, 2017) and pervasive problem in both

4   professional and amateur sport (Alaranta et al., 2006; Locquet et al., 2017; Zabala, Morente-

5   Sánchez, Mateo-March, & Sanabria, 2016). The evidence to date indicates that doping

6   intention and use are associated with dispositional motivation in cross-sectional studies

7   (Ntoumanis, Ng, Barkoukis, & Backhouse, 2014). In a departure from this previous line of

8   research, the aim of our study was to use an experimental design to examine the role of

9   achievement goals in decisions about doping.

10   According to achievement goal theory (Nicholls, 1989) individuals participate in

11   achievement contexts, such as sport, to show competence. The goal of the ego oriented

12   person is to demonstrate success by bettering and establishing superiority over others. Ego

13   orientated athletes should be more likely to dope to facilitate the accomplishment of this

14   goal because "a preoccupation with winning may well be accompanied by a lack of concern

15   about justice and fairness," and "when winning is everything it is worth doing anything to

16   win" (p. 133, Nicholls, 1989). In contrast, the goal of the task oriented person is to work

17   hard to master a task and meet a challenge. Task oriented athletes should be less likely to

18   dope because it means undermining themselves and devaluing a personal accomplishment.

19   Achievement goals have implications for fair play (for review see Harwood, Keegan,

20   Smith, & Raine, 2015; Lochbaum, Kazak, et al., 2016; Lochbaum, Zazo, et al., 2016). For

21   instance, ego orientation has been positively associated with low levels of moral functioning

22   (Kavussanu & Ntoumanis, 2003; Kavussanu & Roberts, 2001) and antisocial behavior

23   (Kavussanu et al., 2006; Sage et al., 2006), whereas task orientation has been associated with

24   high levels of moral functioning (Kavussanu & Ntoumanis, 2003) and positively linked to

25   prosocial behavior (Kavussanu, 2006). Cheating has been defined as deceptive behavior

1   intended to break the rules and make illegitimate gains (Reddiford, 1998). According to the

2   IOC and WADA, doping constitutes a rule violation (WADA, 2015) and is therefore

3   cheating (see Corlett, 2013; Corlett, Brown, & Kirkland, 2013). Thus, the findings that

4   pertain to achievement goals and moral functioning could also apply to other forms of

5   morally relevant behavior, such as doping in sport (Kavussanu, 2014).

6   A meta-analysis by Ntoumanis et al (2014) showed that task goal orientation was a weak

7   negative predictor of doping intention ($r = –.08$), whereas ego goal orientation was a weak

8   positive predictor of doping intention ($r = .14$). Similarly, doping use was weakly and

9   negatively predicted by task goal orientation ($r = –.09$) but was not predicted by ego goal

10   orientation ($r = .04$). Similar patterns between goal orientation and doping were found in a

11   recent meta-analysis by Lochbaum and colleagues (Lochbaum, Kazak, et al. (2016). In sum,

12   the extant research provides only limited support for the expected relationships between

13   goal orientations and doping.

14   Goal orientations are dispositional tendencies to be task or ego involved in an

15   achievement context (Nicholls, 1989). However, the direct regulators of behavior in any

16   achievement context are the achievement goals adopted in that context. These are referred

17   to as task and ego involvement and can be considered the expression of task and ego

18   orientation (Nicholls, 1989). No published study, to our knowledge, has investigated the

19   effects of adopting different achievement goals on the intended or actual use of doping

20   substances. Indeed, only a few experiments have experimentally examined the effects of

21   achievement goals on cheating (e.g., Sage & Kavussanu, 2007; Van Yperen et al., 2011).

22   In the context of sport, Sage and Kavussanu (2007) used written instructions to

23   manipulate task and ego involvement during a table football competition. The ego involving

24   instructions focused on winning, the task involving instructions focused on learning skills,

25   and the control instructions focused on facts. Individuals in the ego involved group displayed

1   more antisocial behavior (e.g., deliberate cheating, rule breaking, table moving, serving out of

2   turn, and serving when opposition not ready) than those in the task involved and control

3   groups. In a non-sport context, Van Yperen et al (2011) used written instructions and recall

4   to manipulate performance (i.e., ego) and mastery (i.e., task) goals before a computerized

5   number grid concentration task, in which cheating by participants was surreptitiously

6   recorded. Participants were asked to recall and describe a similar situation. The

7   performance group cheated more than the mastery group. The amount of cheating by the

8   performance and mastery groups was not different to that by a no goal control group.

9   These experiments demonstrate that achievement goals can be successfully manipulated and

10 influence cheating behavior. In the present study, we used a writing manipulation (Ring &

11 Kavussanu, 2018) to experimentally determine the effects of ego and task goal involvement

12 on doping likelihood.

13   To avoid methodological concerns surrounding the direct reporting of actual doping by

14 athletes, we employed an indirect approach to assess doping, namely, the reported

15 likelihood of doping in hypothetical scenarios by athletes. Scenarios have been used to

16 assess doping in previous studies (e.g., Huybers & Mazanov, 2012; Kavussanu & Ring, 2017;

17 Strelan & Boeckmann, 2006). The advantages of scenarios are that: they protect athletes

18 from directly revealing their views; capture thoughts that are difficult to assess otherwise;

19 refer to different doping situations, and; can ask athletes about the likelihood they would

20 engage in doping in a hypothetical situation. This is important because doping is against the

21 rules and, therefore, it is not a behavior that athletes can confess doing without sanction

22 from governing bodies for sport.

23

1   **Method**

2   **Participants**

3   College athletes, 61 females and 64 males, between 18 and 24 years old, participated in

4   this study. These athletes were currently competing in individual (e.g., athletics, swimming,

5   tennis) and team (e.g., rugby, football, lacrosse) sports at a British university and had history

6   of competing in their sport that ranged between 1 and 16 years. A power calculation

7   (Cohen, 1992) using G*Power (Faul, Erdfelder, Lang, & Buchner, 2007) indicated that, with

8   power $(1-\beta = .80)$ and significance $(\alpha = .05)$ at conventional levels, this study was powered

9   to detect a medium effect size $(f = 0.28)$ by between-group analysis of variance.

10   **Instructions**

11   The goal involving instructions and associated writing tasks were adapted from prior

12   research (Sage & Kavussanu, 2007; Van Yperen et al., 2011). The ego involving instructions

13   emphasized outperforming competitors and winning. The task involving instructions

14   emphasized personal improvement and skill development. The control instructions

15   contained factual information about sport and were not expected to change motivation.

16   The ego-involvement instructions were as follows: "*It is widely accepted that the most*

17   *important goal in sport is to compete against and beat your opponents to see who is best. By*

18   *outperforming your opponents you are able to show that you are clearly superior. By showing other*

19   *people that you are the best you demonstrate that you are a truly great athlete. The best coaches in*

20   *the world recommend that you should only evaluate your ability relative to others and that your*

21   *primary goal should be to outperform others. In sum, the key motivation in sport is to win at any*

22   *cost. We would like you to recall a situation in which you had had the same type of goal. Take a*

23   *few moments to think about this situation. Then, please describe this situation in about ten*

24   *sentences, and include the thoughts and feelings you had in that particular situation*".

1   The task-involvement instructions were as follows: "*It is widely accepted that the most*

2   *important goal in sport is to work hard and perform to the best of your ability. By mastering*

3   *something you could not do before you are able to show that you have achieved your personal*

4   *goals. By showing clear personal improvement and mastery of key skills you demonstrate that you*

5   *are a truly great athlete. The best coaches in the world recommend that you should only evaluate*

6   *your ability relative to yourself and that your primary goal should be to learn, improve, or master*

7   *what you are doing. In sum, the key motivation in sport is to be the best that you can be. We would*

8   *like you to recall a situation in which you had had the same type of goal. Take a few moments to*

9   *think about this situation. Then, please describe this situation in about ten sentences, and include*

10   *the thoughts and feelings you had in that particular situation*

11   The no goal control instructions were as follows: "*It is widely accepted that sport is an*

12   *activity involving physical exertion and skill in which an individual or team competes against another*

13   *or others. Sport involves many forms of physical activity which, through casual or organized*

14   *participation, aim to use physical ability and skills. Hundreds of sports exist, from those requiring*

15   *only two participants, through to those with hundreds of simultaneous participants, either in teams*

16   *or competing as individuals. In organized sport, records of performance are often kept, and for*

17   *popular sports, this information may be widely announced or reported in sport news. In addition,*

18   *sport draws large crowds to venues and reaches wider audiences through sports broadcasting. Take*

19   *a few moments to think about sport. Then, please describe the purpose of about ten sports. Please*

20   *use only one sentence for each sport.*"

21   **Doping Likelihood**

22   Doping likelihood was measured in relation to two scenarios. Both scenarios have

23   been validated in previous doping research (Kavussanu et al., 2016; Kavussanu & Ring, 2017;

24   Ring & Kavussanu, 2018). Participants were asked to imagine that they were in situations

25   that described the use of a banned substance to (a) enhance performance and (b) aid

1   recovery from injury (see Appendix). Participants were told that the substance was

2   prohibited for use in sport; this established that the decision to doping was cheating. They

3   were also told that the chance of being caught was very small; this instruction was intended

4   to lessen any consideration of punishment from the decision about whether to dope

5   (Huybers & Mazanov, 2012; Ring et al., 2018). After reading each scenario, participants were

6   asked to indicate how likely they would be to use the banned substance in each hypothetical

7   situation and responses were made on a 7-point scale, anchored by 1 (*not at all likely*) and 7

8   (*very likely*). Responses were highly correlated ($r = .77$, $p < .001$) across the two scenarios,

9   and, therefore, we averaged responses to increase reliability of measurement. Thus, in line

10   with past research (Kavussanu & Ring, 2017; Ring & Kavussanu, 2018), the average of the

11   responses (one for each scenario) was used as a measure of doping likelihood ($\alpha = .85$).

12   **Goal Involvement Ratings**

13   To quantify their goal involvement, participants were shown the stem "*The goal of sport*

14   *is to …*" and asked to rate three ego involvement items (*outperform others, beat other people,*

15   *win at any cost*) and three task involvement items (*learn a skill, improve a skill, set a new*

16   *personal best*) on a 5-point scale, anchored by 1 (*strongly disagree)* and 5 (*strongly agree*).

17   Ratings were averaged to yield reliable scores of ego ($\alpha = .79$) and task ($\alpha = .72$) goal

18   involvement.

19   **Goal Assignment**

20   To determine whether participants identified their assigned goal state, participants

21   were asked to recall the goal they had been recommended to adopt before completing the

22   scenario task, and select one of three options: "*to do better than others*", "*to improve*", and

23   "*no specific goal was recommended to me*" (Van Yperen et al., 2011). Seventy percent of

24   participants correctly recalled their assigned goal. The number (%) of participants endorsing

25   the ego goal (*to do better than others*), task goal (*to improve*), and no specific goal were 31

1   (74%), 8 (19%) and 3 (7%) in the ego-involving group, 4 (10%), 36 (86%) and 2 (5%) in the

2   task-involving group, and 6 (14%), 14 (34%) and 21 (51%) in the control group, respectively.

3   Only participants who recalled their goal were included in the analyses.

4   **Procedure**

5   After random assignment to one of three groups (ego, n = 42; task, n = 42; control, n

6   = 41), participants read the goal involvement instructions, completed the writing tasks, read

7   the scenarios, and provided doping likelihood ratings, and finished by completing the goal

8   assignment and goal involvement measures.

9   **Data Analysis**

10   A series of 3 Group (ego, task, control) × 2 Gender (male, female) analyses of

11   variance, with both group and gender as between-subjects factors, were conducted on our

12   dependent measures. Gender was a factor in the analyses because of documented

13   differences between males and females in cheating (e.g., Yu, Glanzer, Sriram, Johnson, &

14   Moore, 2017), doping (e.g., Ntoumanis et al., 2014), and motivation (e.g., Roberts, Treasure,

15   & Kavussanu, 1997). Significant effects were followed by post hoc comparisons. Effect size

16   measures have been reported to characterize the importance of our findings (Cohen, 1992).

17   Small, medium, and large effects correspond to partial eta-squared, η_p^2, values of .02, .13,

18   and .25, and standardized mean difference, d, values of .20, .50, and .80, respectively.

19

20   **Results**

21   A 3 Group × 2 Gender ANOVA yielded a group main effect for doping likelihood, F(2,

22   82) = 4.58, p = .01, η_p^2 = .10. Doping was more likely in the ego group (M = 2.11, SD =

23   0.91) than both the task group (M = 1.61, SD = 0.92), p = .03, d = .55, and the control group

24   (M = 1.34, SD = 0.93), p = .005, d = .84. Doping likelihood did not differ between the task

25   and control groups, p = .31, d = .29.

1   A 3 Group × 2 Gender ANOVA yielded a group main effect for ego involvement

2   ratings, $F(2, 82) = 5.57$, $p = .005$, $\eta_p^2 = .12$. The ego involvement ratings were greater in the

3   ego group ($M = 3.80$, $SD = 0.73$) compared to the task group ($M = 3.19$, $SD = 0.74$), $p =$

4    $.001$, $d = .83$. The ego involvement ratings of the control group ($M = 3.47$, $SD = 0.74$) did

5   not differ from those of both the ego group, $p = .12$, $d = .55$, and task group, $p = .19$, $d =$

6    $.38$. A 3 Group × 2 Gender ANOVA indicated that the task involvement ratings did not vary

7   among the ego ($M = 4.57$, $SD = 0.44$), task ($M = 4.49$, $SD = 0.47$), and control ($M = 4.40$, SD

8    $= 0.49$) groups, $F(2, 82) = 0.82$, $p = .44$, $\eta_p^2 = .02$. No gender differences were found

9   regarding the effects of the goal manipulation.

10

11   **Discussion**

12   The role of motivation in doping, a form of cheating, in sport has attracted

13   considerable theoretical interest (e.g., Barkoukis et al., 2013; Donahue et al., 2006; Donovan

14   et al., 2002). However, the empirical evidence underpinning these theoretical models of

15   doping is small in numbers, weak in effect sizes, and inconsistent across studies (Ntoumanis

16   et al., 2014). Importantly, this evidence has been generated using survey-based cross-

17   sectional designs. With a view to re-evaluating the motivation-doping relationship, we

18   conducted an experiment to examine the impact of situational achievement goals on doping

19   likelihood in sport.

20   We experimentally manipulated achievement goals to examine their effects on

21   likelihood of doping in sport. Participants responded to scenarios where they had the

22   opportunity to use a banned substance to enhance performance and aid recovery from

23   injury. We found that the ego involved group reported higher likelihood to use the banned

24   substance compared to the task and control groups. Our findings are in line with previous

25   research that has reported a link between motivation and doping in sport (for review see

1   Ntoumanis et al., 2014) and extend the findings of Sage and Kavussanu (2007), Van Yperen

2   et al. (2011), and Ring and Kavussanu (2018), who showed that individuals who adopt ego

3   (performance) goals are most likely to cheat. Specifically, ego-involved athletes reported

4   that they would be more likely to consume banned substances in hypothetical situations

5   than task-involved and control group athletes.

6   Our findings provide the first experimental evidence for the role of achievement goals

7   on doping in sport. The difference in doping likelihood between ego-involved athletes and

8   control group athletes represented a large effect, and the difference between ego-involved

9   and task-involved athletes corresponded to a medium effect (Cohen, 1992). The

10   meaningfulness of such effects is an important consideration for sport psychologists working

11   with athletes (Lochbaum, 2017). The size of these effects suggest that the level of athletes'

12   ego involvement in sport may have important consequences for the decisions they make

13   about use of performance enhancing substances.

14   Our study yielded interesting and important new findings, however, a number of issues

15   should be considered when interpreting them. First, we measured doping likelihood using

16   ratings in hypothetical situations, and, therefore, we relied on athletes accurately indicating

17   their own likelihood to use banned substances. We emphasized confidentiality and

18   anonymity to participants to minimize any reporting bias. Second, we examined doping

19   likelihood in only two hypothetical situations, and, therefore, the effect of goal involvement

20   in other situations (e.g., Huybers & Mazanov, 2012; Ring et al., 2018) needs to be examined.

21   The use of scenarios describing hypothetical situations is a well established methodology for

22   assessing ethical decision making processes in moral psychology (e.g., Colby & Kohlberg,

23   1987; Rest, 1986), including doping (e.g., Corrion, Scoffier-Meriaux, & d'Arripe-Longueville,

24   2017; Huybers & Mazanov, 2012; Kavussanu et al., 2016; Kavussanu & Ring, 2017; Ring &

25   Kavussanu, 2018; Ring, Kavussanu, Simms, & Mazanov, 2018; Strelan & Boeckmann, 2006;

1 Zelli, Mallia, & Lucidi, 2010). Nonetheless, it should be conceded that social projection,

2 which is inherent in this indirect methodology, can have limitations (e.g., Petroczi, 2016).

3   Third, it must be remembered that we measured the likelihood of doping in

4 hypothetical situations rather than actual doping in the field, and, therefore, the extent of

5 the intention-behaviour gap remains unknown. Based upon previous research (see

6 Ntoumanis et al., 2014) we assume that behavioural intentions and outcomes are influenced

7 by the same social cognitive processes. The validity of this assumption must await

8 confirmation. Lastly, we have argued that doping is cheating (Corlett, 2013; Corlett, Brown,

9 & Kirkland, 2013; Reddiford, 1998). This perspective is shared by key sport organizations,

10 including the IOC and WADA as well as in anecdotal reports of athletes who are vocal

11 about not using banned substances (e.g., Jessica Ennis). Nonetheless, we acknowledge that

12 many athletes do not share this point of view (e.g., Brissonneau & Ohl, 2010; Ohl et al,

13 2015; Smith et al., 2010). Accordingly, it would be informative to examine whether the

14 impact of goal involvement on doping intentions is moderated by whether athletes view

15 doping as cheating.

16   Although past research has charted a turbulent path between achievement goals and

17 doping intentions, all studies to date have been cross sectional, and did not permit

18 conclusions about the direction of causality. The present study was the first to

19 experimentally investigate the effects of situational goal involvement on doping likelihood.

20 This experimental approach provided evidence to show that ego involvement can facilitate

21 doping likelihood, and the effect size for doping likelihood that we observed was medium-

22 to-large in magnitude. Moreover, the task involvement manipulation failed to produce any

23 clear effects on task involvement ratings, and, therefore, this part of the manipulation would

24 need to be improved. Overall, the current research provided important new knowledge to

25 suggest that anti-doping agencies and sport organizations should try and persuade members

1   of the entourage supporting athletes to actively create climates that demote ego

2   involvement. Our research helps create the empirical foundation for motivation-based

3   interventions to protect the health of athletes, encourage athletes who compete free of

4   doping substances, shore up the public's confidence in sport, and protect the sport industry.

5

6   **References**

7   Alaranta, A., Holmila, J., Palmu, P., Pietilä, K., & Helenius, I. (2006). Self-reported attitudes of

8   elite athletes towards doping: Differences between type of sport. *International Journal*

9   *of Sports Medicine, 27*, 842-846.

10   Barkoukis, V., Lazuras, L., Tsorbatzoudis, H., Rodafinos, A. (2013). Motivational and social

11   cognitive predictors of doping intentions in elite sports: An integrated approach.

12   *Scandinavian Journal of Medicine and Science in Sports, 5,* e330-e340.

13   Brissonneau, C., & Ohl, F. (2010). The genesis and effect of French anti-doping policies in

14   cycling. *International Journal of Sport Policy and Politics, 2,* 173-187.

15   Cohen, J. (1992). A power primer. *Psychological Bulletin, 112*, 155-159.

16   Colby, A., & Kohlberg, L. (1987). *The measurement of moral judgment.* Cambridge University

17   Press, New York.

18   Corlett, J. A. (2013). Doping: Just do it?. *Sport, Ethics and Philosophy, 7,* 430-449.

19   Corlett, J. A., Brown, V., & Kirkland, J.K (2013). Coping with doping. *Journal of the Philosophy*

20   *of Sport, 40,* 41-64.

21   Corrion, K., Scoffier-Meriaux, S., & d'Arripe-Longueville, F. (2017). Self-regulatory

22   mechanisms of doping intentions in elite athletes: The role of self-determined

23   motivation in sport. *Journal of Sports Medicine and Doping Studies, 7,* 1-8.

24   Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika,*

25   *16*, 297-334.

1   Diamantopoulos, A., Sarstedt, M., Fuchs, C., Wilczynski, P., & Kaiser, S. (2012). Guidelines

2   for choosing between multi-item and single-item scales for construct measurement: A

3   predictive validity perspective. *Journal of the Academy of Marketing Science, 40,* 434-449.

4   Donahue, E.G., Miquelon, P., Valois, P., Claude Goulet, C., Buist, A., & Vallerand, R.J. (2006).

5   A motivational model of performance-enhancing substance use in elite athletes. *Journal*

6   *of Sport & Exercise Psychology, 28*, 511–520.

7   Donovan, R.J., Egger, G., Kapernick, V., & Mendoza, J. (2002). A conceptual framework for

8   achieving performance enhancing drug compliance in sport. *Sports Medicine, 32*, 269-

9   284.

10   Engelberg, T., Moston, S., Hutchinson, B., & Skinner, J. (2014). *Review of social science anti-*

11   *doping literature and recommendations for action*. Research Report submitted to

12   Australian Government Department of Health.

13   Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical

14   power analysis program for the social, behavioral, and biomedical sciences. *Behavior*

15   *Research Methods, 39,* 175-191.

16   Harwood, C. G., Keegan, R. J., Smith, J. M., & Raine, A. S. (2015). A systematic review of the

17   intrapersonal correlates of motivational climate perceptions in sport and physical

18   activity. *Psychology of Sport and Exercise, 18,* 9-25.

19   Hayes, A.F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A*

20   *regression-based approach*. New York: Guilford Press.

21   Hodge, K., Hargreaves, E. A., Gerrard, D., & Lonsdale, C. (2013). Psychological mechanisms

22   underlying doping attitudes in sport: Motivation and moral disengagement. *Journal of*

23   *Sport & Exercise Psychology, 35*, 419-432.

24   Huybers, T. & Mazanov, J. (2012). What would Kim do? A choice study of projected athlete

25   doping considerations. *Journal of Sport Management, 26*, 322-334.

1   Jalleh, G., Donovan, R. J., & Jobling, I. (2014). Predicting attitude towards performance

2   enhancing substance use: A comprehensive test of the Sport Drug Control Model

3   with elite Australian athletes. *Journal of Science and Medicine in Sport, 17*, 574–579.

4   Kavussanu, M. (2006). Motivational predictors of prosocial and antisocial behaviour in

5   football. *Journal of Sports Sciences, 24*, 575-588.

6   Kavussanu, M. (2014). Moral behavior. In: R.J. Eklund & G.T. Tenenbaum (Eds), *Sage*

7   *encyclopedia of sport and exercise psychology*. Sage Publishers.

8   Kavussanu, M., Hatzigeorgiadis, A., Elbe, A.M., & Ring, C. (2016). The moral disengagement

9   in doping scale. *Psychology of Sport & Exercise, 24*, 188-198.

10 Kavussanu, M., & Ntoumanis, N. (2003). Participation in sport and moral functioning: Does

11   ego orientation mediate their relationship? *Journal of Sport & Exercise Psychology, 25,*

12   1-18.

13 Kavussanu, M., & Ring, C. (2017). Moral identity predicts doping likelihood via moral

14   disengagement and anticipated guilt. *Journal of Sport & Exercise Psychology, 39,* 293-301.

15 Kavussanu, M., & Roberts, G.C. (2001). Moral functioning in sport: An achievement goal

16   perspective. *Journal of Sport & Exercise Psychology, 23*, 37-54.

17 Kavussanu, M., Seal, A.R., & Phillips, D.R. (2006). Observed prosocial and antisocial

18   behaviors in male soccer teams: Age differences across adolescence and the role of

19   motivational variables. *Journal of Applied Sport Psychology, 18*, 326-344.

20 Lochbaum, M. (2017). Understanding the meaningfulness and potential impact of sports

21   psychology on performance. In D. Milanović, G. Sporiš, S. Šalaj, & D. Škegro (Eds.),

22   *Proceedings book of 8th International Scientific Conference on Kinesiology, Opatija, 2017*

23   (pp. 486-489). Zagreb, Croatia: University of Zagreb, Faculty of Kinesiology.

1   Lochbaum, M., Kazak Çetinkalp, Z., Graham, K.A., Wright, T., & Zazo, R. (2016). Task and

2   ego goal orientations in competitive sport: A quantitative review of the literature from

3   1989 to 2016. *Kineziologija, 48*, 3-29.

4   Lochbaum, M., Zazo, R., Kazak Çetinkalp, Z., Graham, K., Wright, T., & Konttinen, N.

5   (2016). A meta-analytic review of achievement goal orientation correlates in competitive

6   sport: A follow-up to Lochbaum et al. (2016). *Kinesiology, 48*, 159-173.

7   Locquet, M., Beaudart, C., Larbuisson, R., Leclercq, V., Buckinx, F., Kaux, J. F., Reginster, J-Y.,

8   & Bruyère, O. (2017). Self-administration of medicines and dietary supplements among

9   female amateur runners: A cross-sectional analysis. *Advances in Therapy, 33*, 2257-2268.

10 Mazanov, J. (2017). *Managing drugs in sport.* Abgindon: Routledge.

11 Nicholls, J.G. (1989). *The competitive ethos and democratic education.* Cambridge, MA: Harvard

12   University Press.

13 Ntoumanis, N., Ng, J.Y.Y, Barkoukis, V., & Backhouse, S. (2014). Personal and psychosocial

14   predictors of doping use in physical activity settings: A meta-analysis. *Sports Medicine,*

15   *44*, 1603-1624.

16 Ohl, F., Fincoeur, B., Lentillon-Kaestner, V., Defrance, J., & Brissonneau, C. (2015). The

17   socialization of young cyclists and the culture of doping. *International Review for the*

18   *Sociology of Sport, 50,* 865-882.

19 Petroczi, A. (2016). Indirect measures in doping behavior research. In: V. Barkoukis, L.

20   Lazuras, & H. Tsorbatzoudis (Eds), *The psychology of doping in sport* (pp. 93-110). New

21   York: Routledge.

22 Poon, W.Y., Leung, K., & Lee, S.Y. (2002). The comparison of single item constructs by

23   relative mean and relative variance. *Organizational Research Methods, 5*, 275-298.

24 Reddiford, G. (1998). Cheating and self-deception in sport. In M. J. McNamee, & S. J. Parry

25   (Eds.), Ethics and sport. London: E & FN Spon.

1   Rest, J.R. (1986). *Moral development: Advances in research and theory*. Praeger, New York.

2   Ring, C., & Kavussanu, M. (2018). The role of self-regulatory efficacy, moral disengagement,

3   and guilt on doping likelihood: A social cognitive theory perspective. *Journal of Sports*

4   *Sciences, 36,* 578-584.

5   Ring, C., & Kavussanu, M. (2018). The impact of achievement goals on cheating in sport.

6   *Psychology of Sport & Exercise, 35,* 98-103

7   Ring, C., Kavussanu, M., Simms, M., & Mazanov, J. (2018). Effects of situational costs and

8   benefits on projected doping likelihood. *Psychology of Sport & Exercise, 34,* 88-94.

9   Roberts, G.C., Treasure, D.C., & Kavussanu, M. (1997). Motivation in physical activity

10   contexts: An achievement goal perspective. In: P.R. Pintrich & M.L. Maehr (Eds.),

11   *Advances in motivation and achievement*, Vol. 10, pp. 413-447. Greenwich, CT: JAI Press.

12   Roberts, G.C., Treasure, D.C., & Balague, G. (1998). Achievements goals in sport: The

13   development and validation of the Perception of Success Questionnaire. *Journal of*

14   *Sports Sciences, 16*, 337-347.

15   Sage, L., & Kavussanu, M. (2007). The effects of goal involvement on moral behavior in an

16   experimentally manipulated competitive setting. *Journal of Sport & Exercise Psychology,*

17   *29,* 190-207.

18   Sas-Nowosielski, K., & Swiatkowska, L. (2008). Goal orientation and attitudes toward

19   doping. *International Journal of Sports Medicine, 29,* 607-612.

20   Smith, A., Stewart, B., Oliver-Bennetts, S., McDonald, S., Ingerson, L., Anderson, A.,

21   Dickson, G., Emery, P., & Graetz, F. (2010). Contextual influences and athlete attitudes

22   to drugs in sport. *Sport Management Review, 13,* 181-197.

23   Strelan, P., & Boeckmann, R. J. (2006). Why drug testing in elite sport does not work:

24   Perceptual deterrence theory and the role of personal moral beliefs. *Journal of Applied*

25   *Social Psychology, 36,* 2909-2934.

1   Van Yperen, N.W., Hamstra, M.R.W., & van der Klauw, M. (2011). To win, or not to lose, at

2   any cost: The impact of achievement goals on cheating. *British Journal of Management,*

3   *22,* S5-S15.

4   WADA (2015). World anti-doping code. Montreal: WADA. Retrieved from

5   http://www.wada-ama.org/

6   Yu, H., Glanzer, P.L., Sriram, R., Johnson, B.R., & Moore, B. (2017). What contributes to

7   college students' cheating? A study of individual factors. *Ethics & Behavior, 27*, 401-422.

8   Zabala, M., Morente-Sánchez, J., Mateo-March, M., & Sanabria, D. (2016). Relationship

9   between self-reported doping behavior and psychosocial factors in adult amateur

10   cyclists. *The Sport Psychologist, 30*, 68-75.

11   Zelli, A., Mallia, L., & Lucidi, F. (2010). The contribution of interpersonal appraisals to a

12   social-cognitive analysis of adolescents' doping use. *Psychology of Sport & Exercise, 11,*

13   304-311.

14

Appendix: Scenarios

"It's the week before the most important competitive game (event) of your season. Your opponents are of similar ability to you. Lately, your performance has been below your best. You don't feel you have the necessary fitness for this competition, and you're concerned about how you'll perform. You mention this to a mate, who tells you that he/she uses a substance to enhance fitness. The substance is prohibited for use in sport according to the rules, but there's only a very small chance you'll be caught."

"It's two weeks before the most important competitive game (event) of your season. Your opponents are of similar ability to you. You really want to take part. However, two months ago, you sustained a knee injury, and you know you need at least one more month of rehabilitation to fully recover. One of your mates tells you that he/she has recently used a new substance, which has helped him/her recover faster than usual from a knee injury. The substance is banned for use in sport, but the chance that you will be caught is extremely small."