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Ego Involvement Increases Doping Likelihood

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Abstract

Achievement goal theory (Nicolls, 1989) provides a framework to help understand how individuals behave in achievement contexts, such as sport. Evidence concerning the role of motivation in the decision to use banned performance enhancing substances (i.e., doping) is equivocal on this issue. The extant literature shows that dispositional goal orientation has been weakly and inconsistently associated with doping intention and doping use. It is possible that goal involvement, which describes the situational motivation state, is a stronger determinant of doping intention. Accordingly, the current study used an experimental design to examine the effects of goal involvement, manipulated using direct instructions and reflective writing, on doping likelihood in hypothetical scenarios in college athletes. The ego-involving goal increased doping likelihood compared to a control no goal and a task-involving goal. The present findings provide the first evidence that ego goal involvement can facilitate the decision to use doping to improve athletic performance.

Keywords: achievement goals; cheating; doping; motivation.

Ego Involvement Increases Doping Likelihood

Doping – the use of banned performance enhancing substances and methods by athletes (WADA, 2015) – is an important (Mazanov, 2017) and pervasive problem in both professional and amateur sport (Alaranta et al., 2006; Locquet et al., 2017; Zabala, Morente-Sánchez, Mateo-March, & Sanabria, 2016). The evidence to date indicates that doping intention and use are associated with dispositional motivation in cross-sectional studies (Ntoumanis, Ng, Barkoukis, & Backhouse, 2014). In a departure from this previous line of research, the aim of our study was to use an experimental design to examine the role of achievement goals in decisions about doping.

According to achievement goal theory (Nicholls, 1989) individuals participate in achievement contexts, such as sport, to show competence. The goal of the ego oriented person is to demonstrate success by bettering and establishing superiority over others. Ego orientated athletes should be more likely to dope to facilitate the accomplishment of this goal because "a preoccupation with winning may well be accompanied by a lack of concern about justice and fairness," and "when winning is everything it is worth doing anything to win" (p. 133, Nicholls, 1989). In contrast, the goal of the task oriented person is to work hard to master a task and meet a challenge. Task oriented athletes should be less likely to dope because it means undermining themselves and devaluing a personal accomplishment.

Achievement goals have implications for fair play (for review see Harwood, Keegan, Smith, & Raine, 2015; Lochbaum, Kazak, et al., 2016; Lochbaum, Zazo, et al., 2016). For instance, ego orientation has been positively associated with low levels of moral functioning (Kavussanu & Ntoumanis, 2003; Kavussanu & Roberts, 2001) and antisocial behavior (Kavussanu et al., 2006; Sage et al., 2006), whereas task orientation has been associated with high levels of moral functioning (Kavussanu & Ntoumanis, 2003) and positively linked to prosocial behavior (Kavussanu, 2006). Cheating has been defined as deceptive behavior

intended to break the rules and make illegitimate gains (Reddiford, 1998). According to the IOC and WADA, doping constitutes a rule violation (WADA, 2015) and is therefore cheating (see Corlett, 2013; Corlett, Brown, & Kirkland, 2013). Thus, the findings that pertain to achievement goals and moral functioning could also apply to other forms of morally relevant behavior, such as doping in sport (Kavussanu, 2014).

A meta-analysis by Ntoumanis et al (2014) showed that task goal orientation was a weak negative predictor of doping intention (r = –.08), whereas ego goal orientation was a weak positive predictor of doping intention (r = .14). Similarly, doping use was weakly and negatively predicted by task goal orientation (r = –.09) but was not predicted by ego goal orientation (r = .04). Similar patterns between goal orientation and doping were found in a recent meta-analysis by Lochbaum and colleagues (Lochbaum, Kazak, et al. (2016). In sum, the extant research provides only limited support for the expected relationships between goal orientations and doping.

Goal orientations are dispositional tendencies to be task or ego involved in an achievement context (Nicholls, 1989). However, the direct regulators of behavior in any achievement context are the achievement goals adopted in that context. These are referred to as task and ego involvement and can be considered the expression of task and ego orientation (Nicholls, 1989). No published study, to our knowledge, has investigated the effects of adopting different achievement goals on the intended or actual use of doping substances. Indeed, only a few experiments have experimentally examined the effects of achievement goals on cheating (e.g., Sage & Kavussanu, 2007; Van Yperen et al., 2011).

In the context of sport, Sage and Kavussanu (2007) used written instructions to manipulate task and ego involvement during a table football competition. The ego involving instructions focused on winning, the task involving instructions focused on learning skills, and the control instructions focused on facts. Individuals in the ego involved group displayed

more antisocial behavior (e.g., deliberate cheating, rule breaking, table moving, serving out of turn, and serving when opposition not ready) than those in the task involved and control groups. In a non-sport context, Van Yperen et al (2011) used written instructions and recall to manipulate performance (i.e., ego) and mastery (i.e., task) goals before a computerized number grid concentration task, in which cheating by participants was surreptitiously recorded. Participants were asked to recall and describe a similar situation. The performance group cheated more than the mastery group. The amount of cheating by the performance and mastery groups was not different to that by a no goal control group. These experiments demonstrate that achievement goals can be successfully manipulated and influence cheating behavior. In the present study, we used a writing manipulation (Ring & Kavussanu, 2018) to experimentally determine the effects of ego and task goal involvement on doping likelihood.

To avoid methodological concerns surrounding the direct reporting of actual doping by athletes, we employed an indirect approach to assess doping, namely, the reported likelihood of doping in hypothetical scenarios by athletes. Scenarios have been used to assess doping in previous studies (e.g., Huybers & Mazanov, 2012; Kavussanu & Ring, 2017; Strelan & Boeckmann, 2006). The advantages of scenarios are that: they protect athletes from directly revealing their views; capture thoughts that are difficult to assess otherwise; refer to different doping situations, and; can ask athletes about the likelihood they would engage in doping in a hypothetical situation. This is important because doping is against the rules and, therefore, it is not a behavior that athletes can confess doing without sanction from governing bodies for sport.

Method

Participants

College athletes, 61 females and 64 males, between 18 and 24 years old, participated in this study. These athletes were currently competing in individual (e.g., athletics, swimming, tennis) and team (e.g., rugby, football, lacrosse) sports at a British university and had history of competing in their sport that ranged between 1 and 16 years. A power calculation (Cohen, 1992) using G*Power (Faul, Erdfelder, Lang, & Buchner, 2007) indicated that, with power ($1-\beta = .80$) and significance ($\alpha = .05$) at conventional levels, this study was powered to detect a medium effect size ($f = 0.28$) by between-group analysis of variance.

Instructions

The goal involving instructions and associated writing tasks were adapted from prior research (Sage & Kavussanu, 2007; Van Yperen et al., 2011). The ego involving instructions emphasized outperforming competitors and winning. The task involving instructions emphasized personal improvement and skill development. The control instructions contained factual information about sport and were not expected to change motivation.

The ego-involvement instructions were as follows: "*It is widely accepted that the most important goal in sport is to compete against and beat your opponents to see who is best. By outperforming your opponents you are able to show that you are clearly superior. By showing other people that you are the best you demonstrate that you are a truly great athlete. The best coaches in the world recommend that you should only evaluate your ability relative to others and that your primary goal should be to outperform others. In sum, the key motivation in sport is to win at any cost. We would like you to recall a situation in which you had had the same type of goal. Take a few moments to think about this situation. Then, please describe this situation in about ten sentences, and include the thoughts and feelings you had in that particular situation*".

The task-involvement instructions were as follows: "*It is widely accepted that the most important goal in sport is to work hard and perform to the best of your ability. By mastering something you could not do before you are able to show that you have achieved your personal goals. By showing clear personal improvement and mastery of key skills you demonstrate that you are a truly great athlete. The best coaches in the world recommend that you should only evaluate your ability relative to yourself and that your primary goal should be to learn, improve, or master what you are doing. In sum, the key motivation in sport is to be the best that you can be. We would like you to recall a situation in which you had had the same type of goal. Take a few moments to think about this situation. Then, please describe this situation in about ten sentences, and include the thoughts and feelings you had in that particular situation*

The no goal control instructions were as follows: "*It is widely accepted that sport is an activity involving physical exertion and skill in which an individual or team competes against another or others. Sport involves many forms of physical activity which, through casual or organized participation, aim to use physical ability and skills. Hundreds of sports exist, from those requiring only two participants, through to those with hundreds of simultaneous participants, either in teams or competing as individuals. In organized sport, records of performance are often kept, and for popular sports, this information may be widely announced or reported in sport news. In addition, sport draws large crowds to venues and reaches wider audiences through sports broadcasting. Take a few moments to think about sport. Then, please describe the purpose of about ten sports. Please use only one sentence for each sport.*"

Doping Likelihood

Doping likelihood was measured in relation to two scenarios. Both scenarios have been validated in previous doping research (Kavussanu et al., 2016; Kavussanu & Ring, 2017; Ring & Kavussanu, 2018). Participants were asked to imagine that they were in situations that described the use of a banned substance to (a) enhance performance and (b) aid

recovery from injury (see Appendix). Participants were told that the substance was prohibited for use in sport; this established that the decision to doping was cheating. They were also told that the chance of being caught was very small; this instruction was intended to lessen any consideration of punishment from the decision about whether to dope (Huybers & Mazanov, 2012; Ring et al., 2018). After reading each scenario, participants were asked to indicate how likely they would be to use the banned substance in each hypothetical situation and responses were made on a 7-point scale, anchored by 1 (*not at all likely*) and 7 (*very likely*). Responses were highly correlated (r = .77, p < .001) across the two scenarios, and, therefore, we averaged responses to increase reliability of measurement. Thus, in line with past research (Kavussanu & Ring, 2017; Ring & Kavussanu, 2018), the average of the responses (one for each scenario) was used as a measure of doping likelihood (α = .85).

Goal Involvement Ratings

To quantify their goal involvement, participants were shown the stem "*The goal of sport is to …*" and asked to rate three ego involvement items (*outperform others, beat other people, win at any cost*) and three task involvement items (*learn a skill, improve a skill, set a new personal best*) on a 5-point scale, anchored by 1 (*strongly disagree)* and 5 (*strongly agree*). Ratings were averaged to yield reliable scores of ego (α = .79) and task (α = .72) goal involvement.

Goal Assignment

To determine whether participants identified their assigned goal state, participants were asked to recall the goal they had been recommended to adopt before completing the scenario task, and select one of three options: "*to do better than others*", "*to improve*", and "*no specific goal was recommended to me*" (Van Yperen et al., 2011). Seventy percent of participants correctly recalled their assigned goal. The number (%) of participants endorsing the ego goal (*to do better than others*), task goal (*to improve*), and no specific goal were 31

(74%), 8 (19%) and 3 (7%) in the ego-involving group, 4 (10%), 36 (86%) and 2 (5%) in the task-involving group, and 6 (14%), 14 (34%) and 21 (51%) in the control group, respectively. Only participants who recalled their goal were included in the analyses.

Procedure

After random assignment to one of three groups (ego, n = 42; task, n = 42; control, n = 41), participants read the goal involvement instructions, completed the writing tasks, read the scenarios, and provided doping likelihood ratings, and finished by completing the goal assignment and goal involvement measures.

Data Analysis

A series of 3 Group (ego, task, control) × 2 Gender (male, female) analyses of variance, with both group and gender as between-subjects factors, were conducted on our dependent measures. Gender was a factor in the analyses because of documented differences between males and females in cheating (e.g., Yu, Glanzer, Sriram, Johnson, & Moore, 2017), doping (e.g., Ntoumanis et al., 2014), and motivation (e.g., Roberts, Treasure, & Kavussanu, 1997). Significant effects were followed by post hoc comparisons. Effect size measures have been reported to characterize the importance of our findings (Cohen, 1992). Small, medium, and large effects correspond to partial eta-squared, η_p^2, values of .02, .13, and .25, and standardized mean difference, d, values of .20, .50, and .80, respectively.

Results

A 3 Group × 2 Gender ANOVA yielded a group main effect for doping likelihood, $F(2, 82) = 4.58$, $p = .01$, $\eta_p^2 = .10$. Doping was more likely in the ego group ($M = 2.11$, $SD = 0.91$) than both the task group ($M = 1.61$, $SD = 0.92$), $p = .03$, d = .55, and the control group ($M = 1.34$, $SD = 0.93$), $p = .005$, d = .84. Doping likelihood did not differ between the task and control groups, $p = .31$, d = .29.

A 3 Group × 2 Gender ANOVA yielded a group main effect for ego involvement ratings, $F(2, 82) = 5.57$, $p = .005$, $\eta_p^2 = .12$. The ego involvement ratings were greater in the ego group ($M = 3.80$, $SD = 0.73$) compared to the task group ($M = 3.19$, $SD = 0.74$), $p = .001$, d = .83. The ego involvement ratings of the control group ($M = 3.47$, $SD = 0.74$) did not differ from those of both the ego group, $p = .12$, d = .55, and task group, $p = .19$, d = .38. A 3 Group × 2 Gender ANOVA indicated that the task involvement ratings did not vary among the ego ($M = 4.57$, $SD = 0.44$), task ($M = 4.49$, $SD = 0.47$), and control ($M = 4.40$, $SD = 0.49$) groups, $F(2, 82) = 0.82$, $p = .44$, $\eta_p^2 = .02$. No gender differences were found regarding the effects of the goal manipulation.

Discussion

The role of motivation in doping, a form of cheating, in sport has attracted considerable theoretical interest (e.g., Barkoukis et al., 2013; Donahue et al., 2006; Donovan et al., 2002). However, the empirical evidence underpinning these theoretical models of doping is small in numbers, weak in effect sizes, and inconsistent across studies (Ntoumanis et al., 2014). Importantly, this evidence has been generated using survey-based cross-sectional designs. With a view to re-evaluating the motivation-doping relationship, we conducted an experiment to examine the impact of situational achievement goals on doping likelihood in sport.

We experimentally manipulated achievement goals to examine their effects on likelihood of doping in sport. Participants responded to scenarios where they had the opportunity to use a banned substance to enhance performance and aid recovery from injury. We found that the ego involved group reported higher likelihood to use the banned substance compared to the task and control groups. Our findings are in line with previous research that has reported a link between motivation and doping in sport (for review see

Ntoumanis et al., 2014) and extend the findings of Sage and Kavussanu (2007), Van Yperen et al. (2011), and Ring and Kavussanu (2018), who showed that individuals who adopt ego (performance) goals are most likely to cheat. Specifically, ego-involved athletes reported that they would be more likely to consume banned substances in hypothetical situations than task-involved and control group athletes.

Our findings provide the first experimental evidence for the role of achievement goals on doping in sport. The difference in doping likelihood between ego-involved athletes and control group athletes represented a large effect, and the difference between ego-involved and task-involved athletes corresponded to a medium effect (Cohen, 1992). The meaningfulness of such effects is an important consideration for sport psychologists working with athletes (Lochbaum, 2017). The size of these effects suggest that the level of athletes' ego involvement in sport may have important consequences for the decisions they make about use of performance enhancing substances.

Our study yielded interesting and important new findings, however, a number of issues should be considered when interpreting them. First, we measured doping likelihood using ratings in hypothetical situations, and, therefore, we relied on athletes accurately indicating their own likelihood to use banned substances. We emphasized confidentiality and anonymity to participants to minimize any reporting bias. Second, we examined doping likelihood in only two hypothetical situations, and, therefore, the effect of goal involvement in other situations (e.g., Huybers & Mazanov, 2012; Ring et al., 2018) needs to be examined. The use of scenarios describing hypothetical situations is a well established methodology for assessing ethical decision making processes in moral psychology (e.g., Colby & Kohlberg, 1987; Rest, 1986), including doping (e.g., Corrion, Scoffier-Meriaux, & d'Arripe-Longueville, 2017; Huybers & Mazanov, 2012; Kavussanu et al., 2016; Kavussanu & Ring, 2017; Ring & Kavussanu, 2018; Ring, Kavussanu, Simms, & Mazanov, 2018; Strelan & Boeckmann, 2006;

Zelli, Mallia, & Lucidi, 2010). Nonetheless, it should be conceded that social projection, which is inherent in this indirect methodology, can have limitations (e.g., Petroczi, 2016).

Third, it must be remembered that we measured the likelihood of doping in hypothetical situations rather than actual doping in the field, and, therefore, the extent of the intention-behaviour gap remains unknown. Based upon previous research (see Ntoumanis et al., 2014) we assume that behavioural intentions and outcomes are influenced by the same social cognitive processes. The validity of this assumption must await confirmation. Lastly, we have argued that doping is cheating (Corlett, 2013; Corlett, Brown, & Kirkland, 2013; Reddiford, 1998). This perspective is shared by key sport organizations, including the IOC and WADA as well as in anecdotal reports of athletes who are vocal about not using banned substances (e.g., Jessica Ennis). Nonetheless, we acknowledge that many athletes do not share this point of view (e.g., Brissonneau & Ohl, 2010; Ohl et al, 2015; Smith et al., 2010). Accordingly, it would be informative to examine whether the impact of goal involvement on doping intentions is moderated by whether athletes view doping as cheating.

Although past research has charted a turbulent path between achievement goals and doping intentions, all studies to date have been cross sectional, and did not permit conclusions about the direction of causality. The present study was the first to experimentally investigate the effects of situational goal involvement on doping likelihood. This experimental approach provided evidence to show that ego involvement can facilitate doping likelihood, and the effect size for doping likelihood that we observed was medium-to-large in magnitude. Moreover, the task involvement manipulation failed to produce any clear effects on task involvement ratings, and, therefore, this part of the manipulation would need to be improved. Overall, the current research provided important new knowledge to suggest that anti-doping agencies and sport organizations should try and persuade members

of the entourage supporting athletes to actively create climates that demote ego involvement. Our research helps create the empirical foundation for motivation-based interventions to protect the health of athletes, encourage athletes who compete free of doping substances, shore up the public's confidence in sport, and protect the sport industry.

References

Alaranta, A., Holmila, J., Palmu, P., Pietilä, K., & Helenius, I. (2006). Self-reported attitudes of elite athletes towards doping: Differences between type of sport. *International Journal of Sports Medicine, 27*, 842-846.

Barkoukis, V., Lazuras, L., Tsorbatzoudis, H., Rodafinos, A. (2013). Motivational and social cognitive predictors of doping intentions in elite sports: An integrated approach. *Scandinavian Journal of Medicine and Science in Sports, 5,* e330-e340.

Brissonneau, C., & Ohl, F. (2010). The genesis and effect of French anti-doping policies in cycling. *International Journal of Sport Policy and Politics, 2,* 173-187.

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

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

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

Corlett, J. A., Brown, V., & Kirkland, J.K (2013). Coping with doping. *Journal of the Philosophy of Sport, 40,* 41-64.

Corrion, K., Scoffier-Meriaux, S., & d'Arripe-Longueville, F. (2017). Self-regulatory mechanisms of doping intentions in elite athletes: The role of self-determined motivation in sport. *Journal of Sports Medicine and Doping Studies, 7*, 1-8.

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 16*, 297-334.

Diamantopoulos, A., Sarstedt, M., Fuchs, C., Wilczynski, P., & Kaiser, S. (2012). Guidelines for choosing between multi-item and single-item scales for construct measurement: A predictive validity perspective. *Journal of the Academy of Marketing Science, 40,* 434-449.

Donahue, E.G., Miquelon, P., Valois, P., Claude Goulet, C., Buist, A., & Vallerand, R.J. (2006). A motivational model of performance-enhancing substance use in elite athletes. *Journal of Sport & Exercise Psychology, 28*, 511–520.

Donovan, R.J., Egger, G., Kapernick, V., & Mendoza, J. (2002). A conceptual framework for achieving performance enhancing drug compliance in sport. *Sports Medicine, 32*, 269-284.

Engelberg, T., Moston, S., Hutchinson, B., & Skinner, J. (2014). *Review of social science anti-doping literature and recommendations for action*. Research Report submitted to Australian Government Department of Health.

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39,* 175-191.

Harwood, C. G., Keegan, R. J., Smith, J. M., & Raine, A. S. (2015). A systematic review of the intrapersonal correlates of motivational climate perceptions in sport and physical activity. *Psychology of Sport and Exercise, 18,* 9-25.

Hayes, A.F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York: Guilford Press.

Hodge, K., Hargreaves, E. A., Gerrard, D., & Lonsdale, C. (2013). Psychological mechanisms underlying doping attitudes in sport: Motivation and moral disengagement. *Journal of Sport & Exercise Psychology, 35*, 419-432.

Huybers, T. & Mazanov, J. (2012). What would Kim do? A choice study of projected athlete doping considerations. *Journal of Sport Management, 26*, 322-334.

Jalleh, G., Donovan, R. J., & Jobling, I. (2014). Predicting attitude towards performance enhancing substance use: A comprehensive test of the Sport Drug Control Model with elite Australian athletes. *Journal of Science and Medicine in Sport, 17*, 574–579.

Kavussanu, M. (2006). Motivational predictors of prosocial and antisocial behaviour in football. *Journal of Sports Sciences, 24*, 575-588.

Kavussanu, M. (2014). Moral behavior. In: R.J. Eklund & G.T. Tenenbaum (Eds), *Sage encyclopedia of sport and exercise psychology*. Sage Publishers.

Kavussanu, M., Hatzigeorgiadis, A., Elbe, A.M., & Ring, C. (2016). The moral disengagement in doping scale. *Psychology of Sport & Exercise, 24*, 188-198.

Kavussanu, M., & Ntoumanis, N. (2003). Participation in sport and moral functioning: Does ego orientation mediate their relationship? *Journal of Sport & Exercise Psychology, 25*, 1-18.

Kavussanu, M., & Ring, C. (2017). Moral identity predicts doping likelihood via moral disengagement and anticipated guilt. *Journal of Sport & Exercise Psychology, 39,* 293-301.

Kavussanu, M., & Roberts, G.C. (2001). Moral functioning in sport: An achievement goal perspective. *Journal of Sport & Exercise Psychology, 23*, 37-54.

Kavussanu, M., Seal, A.R., & Phillips, D.R. (2006). Observed prosocial and antisocial behaviors in male soccer teams: Age differences across adolescence and the role of motivational variables. *Journal of Applied Sport Psychology, 18*, 326-344.

Lochbaum, M. (2017). Understanding the meaningfulness and potential impact of sports psychology on performance. In D. Milanović, G. Sporiš, S. Šalaj, & D. Škegro (Eds.), *Proceedings book of 8th International Scientific Conference on Kinesiology, Opatija, 2017* (pp. 486-489). Zagreb, Croatia: University of Zagreb, Faculty of Kinesiology.

Lochbaum, M., Kazak Çetinkalp, Z., Graham, K.A., Wright, T., & Zazo, R. (2016). Task and ego goal orientations in competitive sport: A quantitative review of the literature from 1989 to 2016. *Kineziologija, 48*, 3-29.

Lochbaum, M., Zazo, R., Kazak Çetinkalp, Z., Graham, K., Wright, T., & Konttinen, N. (2016). A meta-analytic review of achievement goal orientation correlates in competitive sport: A follow-up to Lochbaum et al. (2016). *Kinesiology, 48*, 159-173.

Locquet, M., Beaudart, C., Larbuisson, R., Leclercq, V., Buckinx, F., Kaux, J. F., Reginster, J-Y., & Bruyère, O. (2017). Self-administration of medicines and dietary supplements among female amateur runners: A cross-sectional analysis. *Advances in Therapy, 33*, 2257-2268.

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

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

Ntoumanis, N., Ng, J.Y.Y, Barkoukis, V., & Backhouse, S. (2014). Personal and psychosocial predictors of doping use in physical activity settings: A meta-analysis. *Sports Medicine, 44*, 1603-1624.

Ohl, F., Fincoeur, B., Lentillon-Kaestner, V., Defrance, J., & Brissonneau, C. (2015). The socialization of young cyclists and the culture of doping. *International Review for the Sociology of Sport, 50,* 865-882.

Petroczi, A. (2016). Indirect measures in doping behavior research. In: V. Barkoukis, L. Lazuras, & H. Tsorbatzoudis (Eds), *The psychology of doping in sport* (pp. 93-110). New York: Routledge.

Poon, W.Y., Leung, K., & Lee, S.Y. (2002). The comparison of single item constructs by relative mean and relative variance. *Organizational Research Methods, 5*, 275-298.

Reddiford, G. (1998). Cheating and self-deception in sport. In M. J. McNamee, & S. J. Parry (Eds.), Ethics and sport. London: E & FN Spon.

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

Ring, C., & Kavussanu, M. (2018). The role of self-regulatory efficacy, moral disengagement, and guilt on doping likelihood: A social cognitive theory perspective. *Journal of Sports Sciences, 36,* 578-584.

Ring, C., & Kavussanu, M. (2018). The impact of achievement goals on cheating in sport. *Psychology of Sport & Exercise, 35,* 98-103

Ring, C., Kavussanu, M., Simms, M., & Mazanov, J. (2018). Effects of situational costs and benefits on projected doping likelihood. *Psychology of Sport & Exercise, 34,* 88-94.

Roberts, G.C., Treasure, D.C., & Kavussanu, M. (1997). Motivation in physical activity contexts: An achievement goal perspective. In: P.R. Pintrich & M.L. Maehr (Eds.), *Advances in motivation and achievement*, Vol. 10, pp. 413-447. Greenwich, CT: JAI Press.

Roberts, G.C., Treasure, D.C., & Balague, G. (1998). Achievements goals in sport: The development and validation of the Perception of Success Questionnaire. *Journal of Sports Sciences, 16*, 337-347.

Sage, L., & Kavussanu, M. (2007). The effects of goal involvement on moral behavior in an experimentally manipulated competitive setting. *Journal of Sport & Exercise Psychology, 29,* 190-207.

Sas-Nowosielski, K., & Swiatkowska, L. (2008). Goal orientation and attitudes toward doping. *International Journal of Sports Medicine, 29,* 607-612.

Smith, A., Stewart, B., Oliver-Bennetts, S., McDonald, S., Ingerson, L., Anderson, A., Dickson, G., Emery, P., & Graetz, F. (2010). Contextual influences and athlete attitudes to drugs in sport. *Sport Management Review, 13,* 181-197.

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,* 2909-2934.

Van Yperen, N.W., Hamstra, M.R.W., & van der Klauw, M. (2011). To win, or not to lose, at any cost: The impact of achievement goals on cheating. *British Journal of Management, 22,* S5-S15.

WADA (2015). World anti-doping code. Montreal: WADA. Retrieved from http://www.wada-ama.org/

Yu, H., Glanzer, P.L., Sriram, R., Johnson, B.R., & Moore, B. (2017). What contributes to college students' cheating? A study of individual factors. *Ethics & Behavior, 27*, 401-422.

Zabala, M., Morente-Sánchez, J., Mateo-March, M., & Sanabria, D. (2016). Relationship between self-reported doping behavior and psychosocial factors in adult amateur cyclists. *The Sport Psychologist, 30*, 68-75.

Zelli, A., Mallia, L., & Lucidi, F. (2010). The contribution of interpersonal appraisals to a social-cognitive analysis of adolescents' doping use. *Psychology of Sport & Exercise, 11,* 304-311.

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."