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Running Head: DOPING LIKELIHOOD

Integrating Moral and Achievement Variables to Predict Doping Likelihood in Football: A Cross-Cultural Investigation

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Abstract

Objectives. In our study, we had two objectives. Our first objective was to test a social-cognitive model of doping in sport. In this model, we examined personal (i.e., moral disengagement, moral identity, anticipated guilt) and contextual (i.e., performance motivational climate) predictors of doping likelihood and whether performance motivational climate moderates the relationship between moral disengagement and doping likelihood. The second objective was to determine whether this model is invariant across sex and country.

Design. We used a cross-sectional study design.

Method. Participants were 1,495 (729 females) elite football players (mean age 20.4 ± 4.4) recruited from 93 teams in the UK, Denmark and Greece. They completed questionnaires measuring the aforementioned variables.

Results. Moral disengagement positively predicted doping likelihood both directly and indirectly via anticipated guilt. The direct relationship was significant only when performance climate was perceived as average or high. Moral identity negatively predicted doping likelihood via both moral disengagement and anticipated guilt; and performance climate positively predicted doping likelihood. The model was largely invariant across sex and country.

Conclusions. Our findings suggest that young elite football players in the UK, Denmark and Greece are less likely to use banned substances to enhance their performance, if they consider being moral an important part of who they are, and if they perceive a low performance climate in their team. Moral identity is likely to trigger feelings of guilt associated with the use of banned substances. Our findings highlight the importance of moral variables in predicting doping likelihood.

1 Integrating Moral and Achievement Variables to Predict Doping Likelihood in Football: A Cross-
2 Cultural Investigation

3 The psychological factors associated with the use of banned performance-enhancing
4 substances or methods in sport, also known as doping, have received increased research attention in
5 recent years (see Ntoumanis, Ng, Barkoukis, & Backhouse, 2014). Identifying such factors is
6 important if we want to design interventions to prevent doping in sport. A number of psychological
7 models have been proposed to explain doping (e.g., Barkoukis, Lazuras, & Tsorbatzoudis, 2016;
8 Donovan, Egger, Kapernick, & Mendoza, 2002). The aim of the present research was to extend
9 previous work by testing a model of doping in football players and determine whether this model
10 generalizes to athletes from different countries. Our model integrated elements of social cognitive
11 theory (Bandura, 1991), the model of moral identity (Acquino & Reed, 2002), and achievement
12 goal theory (Ames, 1992).

13 **Moral Variables and Doping**

14 In his social cognitive theory of moral thought and action, Bandura (1991) proposed that
15 individuals develop moral standards through socialization experiences and interaction with others,
16 for example, by observing significant others and through reinforcement and punishment. These
17 moral standards help regulate behavior via evaluative affective self-reactions. Individuals feel
18 satisfaction and pride when they act in line with their moral standards, and experience negative
19 emotions such as shame or guilt when they contravene these standards. These self-sanctions
20 regulate behavior anticipatorily: People typically avoid behaviors that evoke self-condemnation and
21 tend to act in line with their moral standards (Bandura, 1991, 2002). Thus, anticipated emotions are
22 key regulators of moral action.

23 Guilt is one such emotion arising from moral transgressions and has been proposed to be a key
24 regulator of moral action (Bandura, 1991; Tangney, Stuewig, & Mashek, 2007). In their seminal
25 study, Bandura, Barbaranelli, Caprara, and Pastorelli (1996) found that anticipated guilt negatively
26 predicted aggressive behavior in school children. Similar results have been reported in relation to

1 athletes' antisocial behavior (e.g., Stanger, Kavussanu, Boardley, & Ring, 2013) as well as their
2 doping likelihood and susceptibility (e.g., Boardley et al., 2017; Kavussanu & Ring, 2017; Ring &
3 Kavussanu, 2018). Other anticipated negative emotions such as regret or shame about potential
4 doping have also been negatively associated with doping intentions in adolescent and adult athletes
5 (Barkoukis, Lazuras, & Harris, 2015; Lazuras, Barkoukis, & Tsorbatzoudis, 2015).

6 Although anticipated negative emotion regulates moral action, people alleviate these affective
7 experiences that would normally arise from bad behavior via the use of cognitive mechanisms,
8 known as moral disengagement (Bandura, 1991). For example, doping could be contrasted with
9 worse behaviors, such as using illegal drugs (i.e., advantageous comparison), thereby appearing not
10 as serious (Boardley & Grix, 2013); athletes may refer to doping as "juice" or "vitamins" (i.e.,
11 euphemistic labelling), so that the behavior does not sound as bad; they may absolve themselves of
12 responsibility by thinking that "everybody does it" or that their coach, medical personnel or team
13 captain told them to do it (i.e., diffusion and displacement of responsibility); and they can ignore,
14 distort, or minimize the consequences of their behavior for others (i.e., distortion of consequences).
15 Numerous studies have shown a positive relationship between moral disengagement and doping
16 attitudes, temptation, likelihood, or intention in athletes (e.g., Chen, Wang, Wang, & Huang, 2017;
17 Hodge, Hargreaves, Gerrard, & Lonsdale, 2013; Ntoumanis, Barkoukis, Gucciardi, & Chan, 2017).
18 In other work, moral disengagement has predicted doping likelihood or susceptibility indirectly via
19 lower guilt (e.g., Boardley et al., 2017; Kavussanu & Ring, 2017; Ring & Kavussanu, 2018). This
20 evidence is in line with Bandura's (1991) assertion that moral disengagement facilitates
21 transgressive behavior by attenuating the negative emotions associated with this behavior.

22 Building, in part, on social cognitive theory (Bandura, 1991), Aquino and Reed (2002)
23 described the psychological construct of moral identity as a self-regulatory mechanism; they
24 defined this construct as a self-conception organized around a set of moral traits, and proposed that
25 people vary in the degree to which they consider being a moral person as a central part of their self-
26 concept. Moral identity is a strong source of moral motivation due to people's desire to maintain

1 consistency between conceptions of their moral self and their actions (Aquino, Freeman, Reed, Lim,
2 & Felps, 2009). Indeed, individuals whose moral identity was central to their self-concept were less
3 likely to lie in a salary negotiation (Aquino et al., 2009) and more likely to avoid antisocial behavior
4 (Hertz & Krettenauer, 2016). In the context of sport, athletes with a strong moral identity reported
5 less frequent antisocial behavior toward their opponents (Kavussanu, Stanger, & Boardley, 2013;
6 Kavussanu, Stanger, & Ring, 2015; Sage, Kavussanu, & Duda, 2006).

7 Moral identity could deter athletes from doping by influencing both moral disengagement and
8 anticipated guilt. Specifically, athletes with a strong moral identity should be motivated to act
9 morally (i.e., not cheat), thus they would not need to mobilize moral disengagement mechanisms to
10 alleviate the negative affect typically associated with unethical behavior. Athletes with a strong
11 moral identity should also expect to feel guilt, if they used banned substances, as cheating would be
12 incompatible with their view of the self as moral. Indeed, moral identity was a negative predictor of
13 moral disengagement and a positive predictor of anticipated guilt in club and college British athletes
14 (Kavussanu & Ring, 2017; Ring, Kavussanu, Lucidi, & Hurst, 2019). These variables in turn
15 predicted doping likelihood.

16 **The Role of Performance Climate**

17 Doping takes place in a social context; thus to better understand this behavior, consideration
18 of the social environment is essential. One aspect of the social environment that could lead to
19 doping is the motivational climate of the team, which pertains to the achievement goals emphasized
20 and the criteria of success conveyed to the participants by significant others, such as coaches
21 (Ames, 1992). Those significant others determine important features of the achievement context,
22 such as the evaluation procedures and the distribution of rewards, and, via their behavior, they
23 communicate to participants what is valued in that context. Coaches create a “performance”
24 motivational climate when they evaluate success using normative criteria such as winning, reward
25 only the best athletes, and place emphasis on doing better than others. In this climate players may

1 be tempted to cheat in their quest of establishing superiority over others. A team environment that
2 defines success in terms of winning may facilitate doping¹.

3 Research has provided support for the positive link between performance climate and
4 cheating. Football players who perceived a performance motivational climate in their team, were
5 more likely to report diving to fool the referee and deliberate handball (Kavussanu, 2006). Similar
6 results have been reported in other studies examining athletes' antisocial behavior (e.g., Stanger,
7 Backhouse, Jennings & McKenna, 2018; van de Pol, Kavussanu, & Claessens, 2018). However, in
8 elite Scottish athletes, performance climate was unrelated to doping attitudes (Allen, Taylor, Dimeo,
9 Dixon, & Robinson, 2015); this may have been due to the low reliability of the scale scores
10 observed in this study. Performance climate may also accentuate the relationship between moral
11 disengagement and doping likelihood, such that this relationship may become stronger as
12 performance climate becomes more salient. Performance climate could strengthen the temptation to
13 use banned substances and increase the need to morally disengage (Stanger et al., 2018) to enable
14 individuals to use banned substances without feeling guilt. Thus, moral disengagement may have a
15 stronger relationship with doping likelihood when performance climate is salient in the team.

16 **The Present Research**

17 In sum, several studies have found a positive relationship between moral disengagement and
18 doping variables (e.g., Chen et al., 2017; Hodge et al., 2013; Lucidi et al., 2008; Ntoumanis et al.,
19 2017), while recent research has indicated that the process through which moral disengagement
20 facilitates doping may be by reducing anticipated guilt (e.g., Boardley et al., 2017; Kavussanu &
21 Ring, 2017). Less attention has been given to the role of moral identity in predicting doping
22 likelihood with some evidence suggesting that this variable may reduce doping likelihood both by
23 decreasing moral disengagement *and* increasing anticipated guilt (Kavussanu & Ring, 2017; Ring et
24 al., 2019). Finally, no study has investigated the role of performance motivational climate on doping
25 likelihood. This is important because doping is a complex behavior that could be influenced by the

1 context within which it takes place. Considering both the context and the individual athlete
2 characteristics should advance our understanding of this behavior.

3 One limitation of the studies examining moral disengagement, anticipated guilt, and moral
4 identity as predictors of doping (Boardley et al., 2017; Kavussanu & Ring, 2017; Ring et al., 2019)
5 is that they were conducted only in British non-elite athletes. However, doping is a universal
6 phenomenon in elite sport. Therefore, research is needed to determine whether the same processes
7 identified in British non-elite athletes also take place in elite athletes from different countries, who
8 may vary in culture. Replication studies are considered a “must” for the scientific advancement of
9 psychology (Amir & Sharon, 1990) and are important because they increase our confidence in the
10 validity of the findings. Replicating findings across cultures would help us establish general laws of
11 behavior across cultures. Finally, doping has been documented in males and females (Pitsch &
12 Emrich, 2012), and evidence that our model applies to both sexes would further increase our
13 confidence in its utility in predicting doping.

14 Our research, which was funded by the World Anti-Doping Agency, aimed to advance our
15 understanding of doping in sport and had two purposes. The first purpose was to test a social-
16 cognitive model of doping in sport that included the variables discussed above. We expected that:
17 (a) moral disengagement would positively predict doping likelihood both directly and indirectly via
18 anticipated guilt (Hypothesis 1; e.g., Boardley et al., 2017; Kavussanu & Ring, 2017); (b) moral
19 identity would negatively predict doping likelihood via both anticipated guilt and moral
20 disengagement (Hypothesis 2; Kavussanu & Ring, 2017); and (c) performance climate would
21 positively predict doping likelihood (e.g., Hypothesis 3; Kavussanu, 2006) and would moderate the
22 relationship between moral disengagement and doping likelihood (Hypothesis 4). The hypothesized
23 model is depicted in Figure 1.

24 The second purpose of this study was to examine whether our model is invariant across sex
25 and country. Thus, we tested our model in males and females in UK, Denmark, and Greece. We
26 selected these countries due to their location in different parts of Europe (e.g., west, north and

south), and it could be argued that they represent fairly distinct cultures (see Hofstede, 2011). This comparison is important because providing evidence for the invariance of the model across different countries would suggest that the processes we examine are universal rather than country specific. Such evidence would also strengthen our confidence in the study findings. We focused on football, as it is a relatively unexplored sport in doping research and is the most popular sport in Europe.

Method

Participants

A total of 1,495 (729 females) elite football players (mean age 20.4 ± 4.4) from 93 teams participated in the study. In the UK, 506 (251 females) football players (mean age 18.4 ± 1.9) were recruited from 37 Division 1 teams; mean years of playing football were 9.6 ± 3.2 . In Denmark, 509 (251 females) elite football players (mean age 21.3 ± 4.5) were recruited from 13 premier league clubs, 11 clubs from Division 1, and 6 clubs from young talent teams; mean years of playing football were 8.1 ± 4.6 . In Greece, 480 football players (mean age 21.7 ± 5.2 , 223 females) were recruited from 26 clubs in Divisions 1, 2 and 3; mean years of playing football were 8.0 ± 5.0 .

Measures

Prior to the data collection in Denmark and Greece, the entire questionnaire was translated into Danish, and parts of the questionnaire were translated into Greek, using the translation-back-translation method (Brislin, 1970). In Denmark, the translated questionnaire was pilot tested in 52 elite team handball players. Analysis of the pilot test data indicated good reliabilities. In Greece, the questionnaire was administered to 10 football players to ensure that participants could comprehend the questions asked and to measure time for completion. This is the first study to use these measures in Denmark and Greece.

Doping likelihood. Two scenarios developed specifically for this study, in consultation with elite football players, were used to measure doping likelihood; these scenarios have also been used in two other studies (Kavussanu & Ring, 2017; Kavussanu, Hatzigeorgiadis, Elbe, & Ring, 2016). The first scenario described a situation where the participant had the opportunity to use a banned

1 substance to enhance performance, while the second referred to a situation where the banned
2 substance could be used to recover from injury. We present the first scenario¹ below:

3 *It is the day before the most important game of the season. The winner of this game will win*
4 *the league. The team against which you will compete is of similar ability level to your team, and*
5 *they are just one point ahead of your team in the league. Lately, your performance has been below*
6 *your best. You don't feel you have the necessary fitness for this important game, and you are*
7 *concerned about how you will perform. You mention this to one of your teammates, who tells you*
8 *that he/she has been using a new substance, which has enhanced his/her fitness and, as a result,*
9 *his/her performance. The substance is banned for use in sport, but the chance that you will be*
10 *caught is extremely small.*

11 Following each scenario, participants were asked to indicate how likely it was that they
12 would use the banned substance if they were in that hypothetical situation. They indicated their
13 responses on a Likert scale, anchored by 1 (*not at all likely*) and 7 (*extremely likely*).

14 **Anticipated guilt.** The guilt subscale from the State Shame and Guilt Scale (Marschall,
15 Sanftner, & Tangney, 1994) was used to measure anticipated guilt in the two hypothetical
16 situations. Following each scenario, participants were asked to imagine themselves in the situation
17 described in the scenario and indicate how they would feel if they had used the banned substance.
18 The stem for each item was "If I had used the banned substance..." and sample items are "I would
19 feel remorse, regret" and "I would feel bad about what I had done". Participants indicated their
20 responses on a Likert scale anchored by 1 (*not at all*) and 7 (*very strongly*). Marschall et al. (1994)
21 reported very good internal consistency for scale scores ($\alpha = .82$).

22 **Moral disengagement.** Moral disengagement was measured with the six-item Moral
23 Disengagement in Doping Scale (Kavussanu et al., 2016), which captures the six mechanisms of
24 moral disengagement that are relevant to doping (see Lucidi et al., 2008; Kavussanu et al., 2016). A
25 sample item is "Doping does not really hurt anyone". Responses were made on a Likert scale
26 anchored by 1 (*strongly disagree*) and 7 (*strongly agree*). The scale has shown very good levels of

1 internal consistency (α range = .82 - .86) and support for its factorial, convergent, concurrent, and
2 discriminant validity, as well as test-retest reliability has been provided (Kavussanu et al., 2016).

3 **Moral identity.** Moral identity was assessed using the five-item internalization subscale of
4 the moral identity scale, which taps the degree to which being moral is central to individuals' self-
5 concept (Aquino & Reed, 2002). Participants were presented with nine traits (e.g., honest, fair,
6 hardworking, kind, helpful) validated as necessary characteristics of a moral person (Aquino &
7 Reed, 2002), and were asked to respond to statements concerning these traits (e.g., "It would make
8 me feel good to be a person who has these characteristics"). Responses were made on a Likert scale
9 anchored by 1 (*strongly disagree*) and 7 (*strongly agree*). The scale has demonstrated very good
10 internal consistency ($\alpha = .85$; Aquino & Reed, 2002).

11 **Performance motivational climate.** We used an abbreviated version of the performance
12 climate scale of the Perceived Motivational Climate in Sport Questionnaire-2 (PMCSQ-2; Newton,
13 Duda, & Yin, 2000) to measure performance motivational climate. Although this questionnaire also
14 includes a scale that measures mastery motivational climate, this scale was not relevant to this
15 study: Doping is cheating, and past research has shown weak links between mastery climate and
16 behaviors that break the rules of sport (see Kavussanu, 2012). Thus, only performance climate was
17 expected to be associated with doping likelihood. Participants were asked to think how it felt to play
18 on this team during important league games; a sample item is "the coach favours some players more
19 than others". They indicated their level of agreement on a Likert scale anchored by 1 (*strongly*
20 *disagree*) and 5 (*strongly agree*). The abbreviated version consisted of two subscales (punishment
21 for mistakes and social comparison) and 12 items because these items were the only ones relevant
22 to competition, to which the scenarios referred. The PMCSQ-2 has shown good psychometric
23 properties (Newton et al., 2000).

24 **Procedure**

25 Upon approval of the study by the university ethics committee, participants were recruited
26 from football teams. In each of the three countries, one or two Research Assistants (RAs) contacted

1 the coaches of the teams and invited the team to take part in the research. In the UK, 37 teams were
2 contacted, and all agreed to take part; in Denmark, we contacted 32 clubs, and 24 of them agreed to
3 participate with 30 teams (i.e., more than one team was recruited from some clubs). In Greece, 30
4 teams were contacted and all agreed to take part. The RAs administered the questionnaires to the
5 players either before or after a training session. He or she informed them about the purpose of the
6 study, and that their responses would be kept confidential and used only for research purposes. All
7 questionnaires were completed anonymously. We encouraged honest responses by: (a) emphasizing
8 the anonymity of responses; and (b) asking participants to place each completed questionnaire in an
9 envelope and seal it before handing it to the RA. Participants provided informed consent prior to
10 completing the questionnaire. The order of the scales within the questionnaires was counterbalanced
11 to ensure that the order of questions did not influence participants' responses.

12 **Data Analysis**

13 We analyzed the data using Mplus 8.0 (Muthén & Muthén, 1998-2017) and the maximum
14 likelihood estimation method with standard errors, robust to non-normality (MLR). First, we
15 conducted confirmatory factor analyses of the scores of moral disengagement, moral identity,
16 anticipated guilt, and performance climate scales and then examined their reliabilities. We evaluated
17 the fit of the models based on the chi-square, Root Mean Square Error of Approximation (RMSEA),
18 Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Standardized Root Mean square
19 Residual (SRMR). CFI and TLI values close to .90 or .95 reflect a good model fit, RMSEA and
20 SRMR values less than .05 indicate a good fit, and RMSEA values of .05 to .08 indicate close fit
21 (Hu & Bentler, 1999; Schumacker & Lomax, 2016).

22 Then, we tested the structural model (depicted in Figure 1) in which all latent variables were
23 allowed to freely correlate. Indirect relationships were explored using a bootstrapping procedure
24 (Bollen & Stine, 1990; Shrout & Bolger, 2002) with 2,500 bootstrapped samples, decomposing
25 them into separate effects. We also tested whether performance motivational climate moderated the

1 relationship between moral disengagement and doping likelihood. This was modeled as the
2 interaction of two latent variables (see Muthén & Asparahov, 2015).

3 Finally, we examined whether path coefficients differed across sex (male, female) and
4 country (UK, Denmark, Greece) by testing structural invariance across these groups using the Wald
5 test of parameter constraints. Prior to testing path differences across groups, we assessed
6 measurement invariance (i.e., invariance of the constructs). First, we tested the measurement model
7 for each group separately. Then, we tested measurement invariance in steps to assess the
8 psychometric equivalence of the constructs across groups, including (a) *configural*, which indicates
9 equivalence of factor patterns; (b) *metric* (weak factorial), which indicates equivalence of factor
10 loadings; and (c) *scalar* (strong factorial), which indicates equivalence of item intercepts. We
11 compared the models based on the changes in fit indices. A cutoff value of .01 on changes in CFI,
12 paired with cutoff values of .015 on changes in RMSEA and SRMR, was used (see Chen, 2007).

13 Results

14 Preliminary Analysis

15 Missing data on observed variables ranged from 0.27% to 1.67% and were assumed to be
16 missing at random. Before testing the study hypotheses, the factorial structure of each scale was
17 tested in confirmatory factor analyses. The results for the total sample are presented in Table 1. The
18 CFA results for each country are presented in supplementary materials. The fit of the moral
19 disengagement factor was good, while the fit of the moral identity factor was marginally good. For
20 the 2-factor anticipated guilt, each item was specified to correlate with its matching item across the
21 scenarios for conceptual reasons, with the model showing a good fit. The results for performance
22 climate, which included two subscales, showed that a single-factor (Model 4a in Table 1) and two
23 correlated-factor models (Model 4b in Table 1) did not fit the data well. An alternative bifactor
24 model was tested, which specified two uncorrelated specific factors and one general performance
25 climate factor. A bifactor model can be used to test the extent to which a general factor reflects a
26 single variable, even when the data are multidimensional; in this model, each item is loaded on both

1 the general factor and the corresponding specific factor. The bifactor model (Model 4c in Table 1)
2 had a better fit than the one factor model and the two correlated-factors model. The factor loadings
3 showed that the variance related to the group factor was mostly accounted for by the general
4 performance climate factor. This was accepted as the final model. Finally, we tested the entire
5 measurement model, which had a good fit: $\chi^2(512) = 2040.98, p < .001, RMSEA = .045, 90\% CI$
6 $[.043, .047], SRMR = .041, CFI = .939, \text{ and } TLI = .929.$

7 **Descriptive Statistics, Reliabilities, and Correlations**

8 Table 2 shows the Cronbach's alphas, means, standard deviations, and correlations among all
9 study variables for the total sample. The reliability results for each country are presented in
10 supplementary materials. Cronbach's alpha coefficients indicated good-to-very-good reliability for
11 all scale scores. In general, participants reported low likelihood to use banned substances,
12 particularly with respect to performance enhancement; expected to feel a lot of guilt if they used the
13 banned substance; scored high on moral identity and low on moral disengagement; and perceived a
14 relatively low performance climate in their team. Zero-order correlations showed that doping
15 likelihood was positively correlated with moral disengagement and performance climate, and
16 negatively correlated with moral identity and anticipated guilt.

17 **Testing the Hypothesized Structural Model**

18 The structural model (see Figure 2) explained 24.4% and 26.4%, respectively, of the variance
19 in doping likelihood for scenarios 1 and 2; 15.1% and 10.9% of the variance in anticipated guilt for
20 scenarios 1 and 2; and 22.6% of the variance in moral disengagement. Table 3 summarizes the
21 results from testing the hypotheses related to the structural paths among the constructs. As expected
22 (Hypothesis 1), moral disengagement emerged as a positive predictor of doping likelihood. Because
23 the links between moral disengagement and anticipated guilt in both scenarios were significant,
24 indirect relationships were possible. The bootstrapping procedure showed indirect relationships
25 between moral disengagement and doping likelihood in scenario 1 ($\beta = .10, SE = .02, 95\% CI [.07,$

1 .12], $p < .001$) and in scenario 2 ($\beta = .11$, $SE = .02$, 95% CI [.07, .14], $p < .001$) through anticipated
2 guilt, thus supporting Hypothesis 1.

3 With respect to Hypothesis 2, analysis revealed similar results for both scenarios. Specifically,
4 for scenario 1, the total indirect effect of moral identity on doping likelihood was significant ($\beta = -$
5 .21, $SE = .02$, 95% CI [-.25, -.17], $p < .001$). Decomposing this into separate effects revealed
6 significant indirect relationships between moral identity and doping likelihood through: (a) moral
7 disengagement ($\beta = -.11$, $SE = .02$, 95% CI [-.15, -.08], $p < .001$); (b) anticipated guilt ($\beta = -.05$, SE
8 $= .01$, 95% CI [-.08, -.03], $p < .001$); and (c) moral disengagement and anticipated guilt ($\beta = -.05$,
9 $SE = .01$, 95% CI [-.06, -.03], $p < .001$). For scenario 2, the total indirect effect of moral identity on
10 doping likelihood was also significant ($\beta = -.19$, $SE = .02$, 95% CI [-.22, -.15], $p < .001$).

11 Decomposing this effect into separate effects showed significant indirect relationships between
12 moral identity and doping likelihood through: (a) moral disengagement ($\beta = -.10$, $SE = .02$, 95% CI
13 [-.13, -.06], $p < .001$); (b) anticipated guilt ($\beta = -.04$, $SE = .02$, 95% CI [-.07, -.01], $p = .007$); and
14 (c) moral disengagement and anticipated guilt ($\beta = -.05$, $SE = .01$, 95% CI [-.07, -.03], $p < .001$).
15 Thus, Hypothesis 2 was fully supported in both scenarios.

16 As can be seen in Table 3, performance motivational climate emerged as a positive predictor
17 of doping likelihood, supporting Hypothesis 3. In addition, the interaction between moral
18 disengagement and performance climate was significant for predicting doping likelihood in both
19 scenarios, supporting Hypothesis 4. Tests of simple slopes showed that when performance
20 motivational climate is high, the relationship between moral disengagement and doping likelihood
21 is positive and significant (tested at $SE = 1$: $\beta = .49$, $SE = .09$, 95% CI [.32, .66], $p < .001$ for
22 scenario 1; and $\beta = .46$, $SE = .09$, 95% CI [.29, .64], $p < .001$ for scenario 2). However, when
23 performance motivational climate is low, the relationships between moral disengagement and
24 doping likelihood is non-significant (tested at $SE = -1$: $\beta = .12$, $SE = .10$, 95% CI [-.07, .30], $p =$
25 .228 for scenario 1; and $\beta = .17$, $SE = .09$, 95% CI [-.02, .36], $p = .071$ for scenario 2).

26 **Testing Measurement and Structural Invariance Across Sex and Country**

1 Prior to testing the structural invariance of the model, we tested for configural, metric, and
2 scalar measurement invariance of the model across sex and country (see Table 4). Measurement
3 invariance was established across sex. As full scalar invariance was not established across country
4 based on the difference in the CFI value, a partially invariant model was achieved by freeing
5 intercepts of two performance climate items, one moral identity item, and three moral
6 disengagement items. The performance climate items were: “if you want to play in a game you
7 must be one of the best players” and “the coach favours some players more than others”. The moral
8 identity item was: “I strongly desire to have these characteristics”. The moral disengagement items
9 were: “doping is just a way to “maximize your potential”, “players cannot be blamed for doping if
10 their teammates pressure them to do it”, and “doping is alright because it helps your team”.

11 Next, we tested for structural invariance across sex and country. With respect to sex, the Wald
12 tests of parameter constraints ($\chi^2(1) = 7.47, p = .006$) showed that the correlation between scenario
13 1 and scenario 2 doping likelihood was stronger for women ($\beta = .52, SE = .04, p < .001$) than for
14 men ($\beta = .35, SE = .08, p < .001$). In addition, the relationships between moral disengagement and
15 doping likelihood were not invariant across sex for either scenario 1 ($\chi^2(1) = 4.51, p = .034$) or
16 scenario 2 ($\chi^2(1) = 11.36, p < .001$). Specifically, these relationships were stronger for men ($\beta = .27,$
17 $SE = .05, p < .001$ for scenario 1 and $\beta = .28, SE = .05, p < .001$ for scenario 2) than for women ($\beta =$
18 $.13, SE = .04, p = .004$ for scenario 1 and $\beta = .07, SE = .04, p = .097$ for scenario 2).

19 With respect to country invariance, the Wald test ($\chi^2(2) = 10.79, p = .005$) showed that the
20 correlation between scenario 1 and scenario 2 doping likelihood was stronger in Danish ($\beta = .57, SE$
21 $= .06, p < .001$) and Greek ($\beta = .45, SE = .05, p < .001$) than British athletes ($\beta = .30, SE = .05, p <$
22 $.001$). The Wald test ($\chi^2(2) = 7.08, p = .029$) also showed that the relationship between performance
23 motivational climate and scenario 1 doping likelihood was significant for athletes in Denmark ($\beta =$
24 $.19, SE = .04, p < .001$), but not in UK ($\beta = .02, SE = .05, p = .710$) or Greece ($\beta = .07, SE = .06, p$
25 $= .240$). Finally, the Wald test ($\chi^2(2) = 20.77, p < .001$) showed that the relationship between moral

1 identity and moral disengagement was weaker in Danish athletes ($\beta = -.22$, $SE = .06$, $p < .001$) than
2 in British ($\beta = -.57$, $SE = .05$, $p < .001$) and Greek athletes ($\beta = -.48$, $SE = .05$, $p < .001$).

3 **Discussion**

4 Bandura's (1991) social cognitive theory provides a useful theoretical framework to help
5 understand doping in sport and has guided much research on doping (e.g., Boardley et al., 2017;
6 Kavussanu & Ring, 2017; Lucidi et al., 2008). Recent studies in college students or amateur British
7 athletes (e.g., Kavussanu & Ring, 2017; Ring et al., 2019) have integrated elements from the social
8 cognitive theory and the model of moral identity proffered by Aquino and Reed (2002) to examine
9 doping likelihood. In this study, we tested a social-cognitive model of doping in which we
10 integrated elements from social cognitive theory, achievement goal theory, and the model of moral
11 identity; we also tested whether this model is invariant across sex and culture. We examined doping
12 likelihood with respect to two hypothetical situations describing the opportunity for performance
13 enhancement and the possibility of accelerating recovery from injury.

14 **Moral Disengagement and Doping Likelihood**

15 In line with our hypothesis, moral disengagement predicted doping likelihood both directly
16 and indirectly via anticipated guilt. This finding supports two main tenets of social cognitive theory
17 (Bandura, 1991), namely that anticipated affective self-sanctions play an important role in
18 regulating transgressive behavior, and that moral disengagement enables individuals to engage in
19 such behavior by reducing these self-sanctions. Previous studies have also shown that moral
20 disengagement positively predicts doping likelihood and susceptibility, as well as aggression and
21 antisocial behavior by acting on anticipated guilt (e.g., Bandura et al., 1996; Boardley et al., 2017;
22 Kavussanu & Ring, 2017; Stanger et al., 2013). However, this is the first study to show this effect in
23 a large sample of elite football players across three European countries.

24 This finding also highlights the important role of guilt on doping – guilt arises from moral
25 transgressions and is assumed to regulate behavior because people strive to minimize affective
26 dissonance elicited by threats to the moral self (e.g., Tangney et al., 2007). Anticipated regret, a

1 variable similar to guilt, about potential doping has also been inversely associated with doping
2 intentions in previous research (e.g., Barkoukis et al., 2015; Lazuras et al., 2015). Anticipated guilt
3 is a key variable in our understanding of doping with strong negative links to doping likelihood.
4 Taken together with past work, our findings suggest that negatively valenced, self-conscious
5 emotions such as guilt can act as self-sanctions that thwart doping and can be reduced by moral
6 disengagement.

7 Moral disengagement had also a *direct* effect on doping likelihood, a finding that is in line
8 with previous research (e.g., Boardley et al., 2017; Kavussanu & Ring, 2017). This suggests that
9 moral disengagement may act on doping likelihood via other processes and that guilt is not the only
10 mechanism through which moral disengagement thwarts doping. Our findings replicate and extend
11 previous research that has consistently shown strong links between moral disengagement and
12 doping attitudes or intentions in athletes from a variety of countries and sports (Chen et al., 2017;
13 Hodge et al., 2013; Ntoumanis et al., 2017). The findings highlight the significance of intervening
14 on moral disengagement, or its antecedents, to reduce doping in sport.

15 It is worth noting that the relationship between moral disengagement and doping likelihood
16 was stronger in men than in women, and, in women, it did not predict doping likelihood in the
17 injury recovery scenario. It may be that men are more prone to morally disengage, which may make
18 one more likely to use banned substances. Indeed, past research has shown gender differences, with
19 men scoring higher on moral disengagement than women (Boardley & Kavussanu, 2007). We also
20 found that the relationship between moral disengagement and doping likelihood was significant
21 only when performance climate was perceived as average or high. It would be interesting for future
22 research to further explore these relationships.

23 **Moral Identity and Doping Likelihood**

24 Moral identity was indirectly related to doping likelihood via moral disengagement. This
25 finding is in line with previous research in amateur British athletes from a variety of team sports
26 (Kavussanu & Ring, 2017), and further underscores the importance of having a strong moral

1 identity for deterring doping. Individuals who consider being moral a central part of who they are
2 (i.e., their self-concept) are less likely to morally disengage to facilitate transgressive behaviors
3 such as doping. Although Bandura (1991) does not refer to moral identity explicitly, he mentions
4 moral standards as important regulators of moral conduct. People with a strong moral identity
5 should have high moral standards, as these individuals consider being moral (which is translated
6 into acting in an ethical manner) as central to their self-concept. It may be that a strong moral
7 identity reduces the need for moral disengagement because these athletes are less likely to consider
8 transgressive behavior.

9 Moral identity was also indirectly associated with doping likelihood via anticipated guilt.
10 Athletes who have strong moral identity may be deterred from using banned substances to enhance
11 their performance and recover from injury because they would expect to experience guilt. This
12 finding supports and extends past work, which has shown a negative link between moral identity
13 and antisocial sport behavior (e.g., Kavussanu et al., 2013, 2015; Sage et al., 2006) as well as
14 unethical conduct in other contexts (Hertz & Krettenauer, 2016). Like other transgressive acts,
15 doping may be viewed as unethical behavior, which is not compatible with the perception of the
16 athlete as a moral person. That these effects were evident with respect to both the performance
17 enhancement and the injury recovery scenarios further attest to the validity of our findings.

18 **Performance Motivational Climate and Doping Likelihood**

19 Performance motivational climate positively predicted doping likelihood for both performance
20 enhancement and injury recovery. Thus, athletes who perceived their coach emphasizing winning at
21 all costs, favoring the best players, and taking players out of the game for mistakes, thereby
22 communicating that winning is most valued, were more likely to indicate higher likelihood to use
23 banned substances. Performance motivational climate has been positively associated with antisocial
24 behavior in sport (Kavussanu, 2006; Stanger et al., 2018), thus our finding is in line with previous
25 research on other transgressive sport behaviors. However, it is not in accord with the findings of

1 study in Scottish athletes, where performance climate was unrelated to doping attitudes (Allen et al.,
2 2015); the null findings in that study may have been due to low reliability of scale scores.

3 The positive relationship between moral disengagement and doping likelihood was stronger
4 when football players perceived a high performance climate in their team. Thus, performance
5 climate may accentuate the potentially facilitating role of moral disengagement on doping
6 likelihood. When athletes perceive a performance climate in their team, they may have a stronger
7 temptation to use banned substances – due to the emphasis of the coach on winning – and the
8 tendency to morally disengage may be more likely to lead one to use banned substances.
9 Interestingly, when performance climate was low, moral disengagement was not related to doping
10 likelihood. The moderating role of performance climate on the relationship between moral
11 disengagement and doping likelihood is an important finding that extends our understanding of
12 doping in sport. The finding highlights the role the motivational environment can play in this
13 relationship and suggests that some context and person variables could operate in a synergistic
14 manner to facilitate doping.

15 **Structural Invariance across Sex and Country**

16 Results of invariance testing showed that the model was largely invariant across sex and
17 country; however, some differences were identified. Specifically, the correlation between the two
18 scenarios was stronger in women than men. Each scenario described a slightly different context,
19 which did not seem to matter for women. Men, on the other hand, appear to differentiate between
20 scenarios, that is, their doping likelihood was dependent on the context. This suggests that there is
21 more stability in doping likelihood in women than in men. Similar findings were revealed for
22 Danish and Greek athletes who evidenced stronger relationship between scenarios 1 and 2 doping
23 likelihood compared to British athletes. The results showed that there was less differentiation
24 between the two scenarios (i.e., participants showed more consistency across situations) in Danish
25 and Greek athletes, compared to British athletes.

1 Two additional differences emerged from our invariance testing: Performance climate
2 predicted doping likelihood for scenario 1 (performance enhancement) in Danish, but not in British
3 or Greek athletes, and the relationship between moral identity and moral disengagement was weaker
4 in Danish athletes compared to their British and Greek counterparts. In Danish athletes, a team
5 environment that emphasizes normative success may facilitate the use of banned substances to
6 enhance performance more than it would in British or Greek athletes. Perhaps there are aspects of
7 the Danish sport culture that have led to these differences. Perhaps the morality of Danish athletes is
8 different from the morality of British and Greek athletes. Indeed, one study found that Danish
9 athletes replied less honestly about doping behavior than athletes in other European countries (Elbe
10 & Pitsch, 2018). The differences identified between countries highlight the importance of being
11 aware of cultural variation (Ryba, Schinke, & Tenenbaum, 2009) and suggest that doping
12 prevention programs should consider gender and cultural differences. For Denmark, for example, it
13 seems especially relevant for practitioners to pay attention to the performance climate.

14 **Practical Implications**

15 Our findings have important implications for doping prevention. The findings point to the
16 importance of developing anti-doping interventions that target moral variables (i.e., moral identity,
17 moral disengagement, and anticipated guilt). One way this can be done is through seminars
18 delivered by trained facilitators in small groups of athletes to encourage engagement and reflection.
19 In these seminars, the facilitator can discuss the importance of fair play, point to the positive
20 consequences this has for athletes, and discuss the negative psychological and social consequences
21 of doping for others. The facilitator can also present stories of athletes who have been successful in
22 sport while competing clean. These athletes can act as moral exemplars inspiring younger athletes
23 to do the same, thus gradually strengthening their moral identity. Doping prevention programmes
24 can also include stories of athletes who have doped and recall their experiences of guilt, typically
25 associated with doping. This should increase participants' anticipated guilt, thereby further
26 deterring doping. For moral disengagement, interventions could make participants aware of the

1 justifications used by athletes who dope and challenge these justifications. For example, the
2 “distortion of consequences” mechanism, exemplified by the statement “doping does not hurt
3 anyone” could be challenged by pointing out that doping does hurt others.

4 The effect of performance climate on doping likelihood and its role in accentuating the
5 positive relationship between moral disengagement and doping likelihood also have practical
6 implications. Performance climate is evident when coaches put a lot of emphasis on winning, and
7 this is manifested in behaviors such as negative reactions to athlete mistakes and giving the most
8 attention to the best players due to their value in helping the team win. Coaches need to avoid this
9 type of behavior that communicates to athletes that “winning is everything” as this attitude can lead
10 athletes to use banned substances to elicit positive coach reactions. Coaches need to understand the
11 important role they play in influencing athletes, and in their interactions with athletes, they need to
12 emphasize adhering to the rules of sport, which include not using banned substances to enhance
13 performance. Gradually, athletes should internalize the value of fair play, and this should strengthen
14 their moral identity.

15 **Limitations of the Study and Directions for Future Research**

16 The present research revealed some interesting findings, but also has some limitations. First,
17 we used a cross-sectional design, and therefore, we cannot make firm assertions about the direction
18 of causality. We can simply say that our data supported the hypothesized model. It would be
19 enlightening to attempt to replicate our findings using longitudinal and experimental designs, which
20 provide clearer evidence for the direction of causality. Second, this study included only football
21 players. It would be interesting to replicate this study in other types of sport that have been
22 identified as being more prone to doping (e.g., Pitsch & Emrich 2012; Striegel, Ulrich, & Simon,
23 2010). Third, although our measurement model had a good fit to the data for each country, full
24 scalar invariance was not established. Achieving partial scalar invariance allowed us to make
25 inferences about invariance of structural paths. Because only a partial measurement invariance was
26 achieved, interpretations should be made with caution.

Conclusion

1
2 In conclusion, our findings suggest that young elite football players in the UK, Denmark and
3 Greece are less likely to use banned substances to enhance their performance and recover from
4 injury if they consider being moral an important part of their identity. Moreover, when football
5 players perceive a performance climate in their team they are more likely to use banned substances.
6 This type of climate may accentuate the potentially facilitating effects of moral disengagement on
7 doping likelihood. Moral identity is likely to trigger feelings of guilt associated with the use of
8 banned substances, and could reduce the need to morally disengage leading to lower likelihood to
9 dope. Finally, anticipated guilt appears to be a key variable in the prediction of doping likelihood
10 among elite football players. In sum, our findings underscore the importance of considering moral
11 variables in our understanding of doping in sport.

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Endnotes

¹The second scenario is available from the first author upon request.

²Before conducting our final analyses, we considered a multilevel approach to data analyses.

Athletes are nested within teams, and it can be expected that their likelihood to use doping is similar within teams. Therefore, we considered approaching data analysis through multilevel structural equation modeling (MSEM) with two levels, partitioning the total variance of doping likelihood into within-team and between-team variances, in line with previous studies with athletes nested within teams (e.g., Yukhymenko-Lescroart et al., 2015; Yukhymenko-Lescroart, 2018). When the two items of doping likelihood (one for each scenario) were specified as single-item latent factors using a two-level model, in which athletes were clustered within teams, the intraclass correlations indicated that athletes within teams shared 11.5% and 11.8% of the variance in doping likelihood for scenario 1 and 2 respectively. However, after attempting to explore structural relationships using a two-level model, we faced a number of issues (including non-convergence of the model with the latent variable interaction) because the number of parameters was greater than the number of *between* units (i.e., 93 teams). Exploring and comparing results for structural relationships of a two-level model and a traditional single-level model showed that while the values for some estimates slightly differed across single-level and two-level models, from a practical consideration standpoint, the results were not different. With these considerations in mind, and because we were interested in exploring the relationships at the athlete level, we proceeded with a single-level SEM model.

References

- 1
2 Allen, J., Taylor, J., Dimeo, P., Dixon, S., & Robinson, L. (2015). Predicting elite Scottish athletes'
3 attitudes towards doping: examining the contribution of achievement goals and motivational
4 climate. *Journal of Sports Sciences*, 33, 899-906.
- 5 Ames, C. (1992). Achievement goals, motivational climate, and motivational processes. In G.C.
6 Roberts (Ed.), *Motivation in Sport and Exercise* (pp. 161-176). Champaign: Human Kinetics.
- 7 Amir, Y., & Sharon, I. (1990). Replication research: A must for the scientific advancement of
8 psychology. *Journal of Social Behavior and Personality*, 5, 51-69.
- 9 Aquino, K., & Reed, A. (2002). The self-importance of moral identity. *Journal of Personality and*
10 *Social Psychology*, 83, 1423-1440.
- 11 Aquino, K., Freeman, D., Reed, A., II, Lim, V.K.G., & Felps, W. (2009). Testing a social cognitive
12 model of moral behavior: The interaction of situational factors and moral identity centrality.
13 *Journal of Personality and Social Psychology*, 97, 123–141.
- 14 Bandura, A. (1991). Social cognitive theory of moral thought and action. In W.M. Kurtines & J.L.
15 Gewirtz (Eds.), *Handbook of moral behavior and development: Theory, research, and*
16 *applications* (Vol. 1, pp. 71–129). Hillsdale, NJ: Lawrence Erlbaum Associates.
- 17 Bandura, A. (2002). Selective moral disengagement in the exercise of moral agency. *Journal of*
18 *Moral Education*, 31, 101–119.
- 19 Bandura, A., Barbaranelli, C., Caprara, G.V., & Pastorelli, C. (1996). Mechanisms of moral -
20 disengagement in the exercise of moral agency. *Journal of Personality and Social Psychology*,
21 71, 364–374.
- 22 Barkoukis, V., Lazuras, L., & Harris, P.R. (2015). The effects of self-affirmation manipulation on
23 decision making about doping use in elite athletes. *Psychology of Sport and Exercise*, 16,
24 175–181.
- 25 Barkoukis, V., Lazuras, L., & Tsorbatzoudis, H. (2016). *The psychology of doping in sport*. New
26 York, NY: Routledge.

- 1 Boardley, I.D. & Grix, J. (2013). Doping in bodybuilders: a qualitative investigation of facilitative
2 psychosocial processes. *Qualitative Research in Sport, Exercise and Health*, 6, 422-439.
- 3 Boardley, I.D., Smith, A.L., Mills, J.P., Grix, J., & Wynne, C. (2017). Empathic and self-regulatory
4 processes governing doping behavior. *Frontiers in Psychology*.
5 <https://doi.org/10.3389/fpsyg.2017.01495>
- 6 Bollen, K. A., & Stine, R., (1990). Direct and indirect effects: Classical and bootstrap estimates of
7 variability. *Sociological Methodology*, 20, 115-140.
- 8 Brislin, R. W. (1970). Back-translation for cross-culture research. *Journal of Cross-Cultural*
9 *Psychology*, 1, 185–216.
- 10 Chen, F. F. (2007). Sensitivity of goodness of fit indices to lack of measurement invariance.
11 *Structural Equation Modeling*, 14, 464-504.
- 12 Chen, Z., Wang, D., Wang, K., & Huang, T. (2017). Coaching style and attitudes toward doping in
13 Chinese athletes: The mediating role of moral disengagement. *International Journal of Sports*
14 *Science & Coaching*, 12, 312–318.
- 15 Donovan, R.J., Egger, G., Kapernick, V., & Mendoza, J. (2002). A conceptual framework for
16 achieving performance enhancing drug compliance in sport. *Sports Medicine*, 32, 269–284.
- 17 Elbe, A.M., & Pitsch, W. (2018). Doping prevalence among Danish elite athletes. *Performance*
18 *Enhancement and Health*. <https://doi.org/10.1016/j.peh.2018.01.001>
- 19 Hertz, S.G., & Krettenauer, T. (2016). Does moral identity effectively predict moral behavior? A
20 meta-analysis. *Review of General Psychology*, 20, 129–140.
- 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 Sport &*
23 *Exercise Psychology*, 35, 419–432.
- 24 Hofstede, G. (2011). Dimensionalizing cultures: The Hofstede model in context. *Online Readings in*
25 *Psychology and Culture*, 2(1). <https://doi.org/10.9707/2307-0919.1014>

- 1 Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis:
2 Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6(1), 1-55.
- 3 Kavussanu, M. (2006). Motivational predictors of prosocial and antisocial behavior in football.
4 *Journal of Sports Sciences*, 24(6), 575-588.
- 5 Kavussanu, M. (2012). Moral behavior in sport. In S. Murphy (Ed.), *The Oxford handbook of sport*
6 *and performance psychology* (pp. 364-383). Oxford: Oxford University Press.
- 7 Kavussanu, M., & Ring, C. (2017). Moral identity predicts doping likelihood via moral
8 disengagement and anticipated guilt. *Journal of Sport & Exercise Psychology* 39, 293-301.
- 9 Kavussanu, M., Hatzigeorgiadis, A., Elbe, A.M., & Ring, C. (2016). The Moral Disengagement in
10 Doping Scale. *Psychology of Sport and Exercise*, 24, 188-198.
- 11 Kavussanu, M., Stanger, N., & Boardley, I. D. (2013). The Prosocial and Antisocial Behavior in
12 Sport Scale: Further evidence for construct validity and reliability. *Journal of Sports Sciences*,
13 31, 1208-1221.
- 14 Kavussanu, M., Stanger, N., & Ring, C. (2015). The effects of moral identity on moral emotion and
15 antisocial behavior in sport. *Sport, Exercise, and Performance Psychology*, 4, 268–279.
- 16 Lazuras, L., Barkoukis, V., & Tsorbatzoudis, H. (2015). Toward an integrative model of doping
17 use: An empirical study with adolescent athletes. *Journal of Sport & Exercise Psychology*,
18 37, 37–50.
- 19 Lucidi, F., Zelli, A., Mallia, L., Grano, C., Russo, P.M., & Violani, C. (2008). The social cognitive
20 mechanisms regulating adolescents' use of doping substances. *Journal of Sports Sciences*, 26,
21 447–456.
- 22 Marschall, D. E., Sanftner, J. L., & Tangney, J. P. (1994). *The State Shame and Guilt Scale (SSGS)*.
23 Fairfax, VA: George Mason University.
- 24 Muthén, B., & Asparouhov, T. (2015, November 2). Latent variable interactions. Retrieved from
25 <https://www.statmodel.com/download/LVinteractions.pdf>.

- 1 Muthén, B., & Asparouhov, T. (2012). Bayesian SEM: A more flexible representation of
2 substantive theory. *Psychological Methods, 17*, 313-335.
- 3 Muthén, L. K., & Muthén, B. O. (1998-2017). *Mplus User's guide* (Eighth edition). Los Angeles,
4 CA: Muthén & Muthén.
- 5 Newton, M., Duda, J., & Yin, Z. (2000). Examination of the psychometric properties of the
6 Perceived Motivational Climate in Sport Questionnaire - 2 in a sample of female athletes.
7 *Journal of Sports Sciences, 18*, 275-290.
- 8 Ntoumanis, N., Barkoukis, V., Gucciardi, D.F., & Chan, D.K.C. (2017). Linking coach
9 interpersonal style with athlete doping intentions and doping use: A prospective study.
10 *Journal of Sport & Exercise Psychology, 39*, 188– 198.
- 11 Ntoumanis, N., Ng, J.Y.Y., Barkoukis, V., & Backhouse, S. (2014). Personal and psychosocial
12 predictors of doping use in physical activity settings: A meta-analysis. *Sports Medicine, 44*,
13 1603–1624.
- 14 Pitsch, W., & Emrich, E. (2012). The frequency of doping in elite sport: Results of a replication
15 study. *International Review for the Sociology of Sport 47*, 559–580.
- 16 Ring, C., & Kavussanu, M. (2018). The role of self-regulatory efficacy, moral disengagement and
17 guilt on doping likelihood: A social cognitive theory perspective. *Journal of Sports Sciences*,
18 *36*, 578-584.
- 19 Ring, C., Kavussanu, M., Lucidi, S., & Hurst, P. (2019). Effects of personal and situational factors
20 on self-referenced doping likelihood. *Psychology of Sport and Exercise, 41*, 29-35.
- 21 Ryba, T., Schinke, R., & Tenenbaum, G. (2009). *The cultural turn in sport psychology*.
22 Morgantown, WV: Fitness Information Technology.
- 23 Schumacker, R.E., & Lomax, R.G. (2016). *A beginner's guide to structural equation modelling* (4th
24 edition). New York and London: Routledge.
- 25 Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New
26 procedures and recommendations. *Psychological Methods, 7*, 422-445.

- 1 Stanger, N., Backhouse, S. H., Jennings, A., & McKenna, J. (2018). Linking motivational climate
2 with moral behavior in youth sport: The role of social support, perspective taking, and moral
3 disengagement. *Sport, Exercise, and Performance Psychology*.
4 <http://dx.doi.org/10.1037/spy0000122>
- 5 Stanger, N., Kavussanu, M., Boardley, I.D., & Ring, C. (2013). The influence of moral
6 disengagement and negative emotion on antisocial sport behavior. *Sport, Exercise, and*
7 *Performance Psychology*, 2, 117–129.
- 8 Striegel, H., Ulrich, R., & Simon, P. (2010). Randomised response estimates for doping and illicit
9 study. *International Review for the Sociology of Sport*, 47, 559–580.
- 10 Tangney, J., Stuewig, J., & Mashek, D.J. (2007). Moral emotions and moral behavior. *Annual*
11 *Review of Psychology*, 58, 345–372.
- 12 van de Pol, P.K.C., Kavussanu, M., & Claessens, B. (2018). Moral functioning across training and
13 competition in sport. *International Journal of Sport and Exercise Psychology*, DOI:
14 10.1080/1612197X.2018.1511623
- 15 Yukhymenko-Lescroart, M. A. (2018). On identity and sport conduct of student-athletes:
16 Considering athletic and academic contexts. *Psychology of Sport and Exercise*, 34, 10-19.
- 17 Yukhymenko–Lescroart, M. A., Brown, M. E., & Paskus, T. S. (2015). The relationship between
18 ethical and abusive coaching behaviors and student-athlete well-being. *Sport, Exercise, and*
19 *Performance Psychology*, 4, 36-49.

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Table 1

Results for Confirmatory Factor Analysis for Each Measure (N = 1494)

Model	χ^2	<i>df</i>	RMSEA	CFI	TLI	SRMR
1. Moral disengagement	46.66	9	.053	.970	.950	.027
2. Moral identity	70.82	4	.106	.950	.876	.021
3. Guilt: two factors	345.21	29	.085	.959	.936	.040
4a. Performance climate: one factor	1085.26	54	.113	.824	.784	.065
4b. Performance climate: two correlated factors	889.08	53	.103	.857	.822	.061
4c. Performance climate: bifactor	411.45	42	.077	.937	.901	.047

Notes. RMSEA = root mean square error of approximation; CFI = comparative fit index; TLI = Tucker-Lewis index; SRMR = standardized root mean squared residual; *df* = degrees of freedom.

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Table 2

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Means, Standard Deviations, Reliability Estimates, and Pearson's Correlations Among All Variables (N = 1494)

Variables	α	M	SD	1	2	3	4	5	6
1. Doping likelihood (scenario 1)	n/a	1.71	1.24	-					
2. Doping likelihood (scenario 2)	n/a	2.04	1.49	.54 ^{***}	-				
3. Anticipated guilt (scenario 1)	.94	5.20	1.69	-.40 ^{***}	-.37 ^{***}	-			
4. Anticipated guilt (scenario 2)	.94	5.06	1.75	-.32 ^{***}	-.44 ^{***}	.83 ^{***}	-		
5. Moral disengagement	.78	2.19	1.04	.35 ^{***}	.32 ^{***}	-.31 ^{***}	-.27 ^{***}	-	
6. Moral identity	.79	5.75	1.06	-.18 ^{***}	-.15 ^{***}	.22 ^{***}	.17 ^{***}	-.38 ^{***}	-
7. Performance climate	.89	2.67	.74	.16 ^{***}	.19 ^{***}	-.11 ^{***}	-.14 ^{***}	.21 ^{***}	-.12 ^{***}

Note. Possible range of responses 1 – 7 for all variables except for performance climate (1-5). Scenario 1 was about performance enhancement; scenario 2 was about injury recovery.

* $p < .05$, ** $p < .01$, *** $p < .001$.

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Table 3

SEM Results: Standardized Direct Effects for the Combined Effects Model, N = 1494

	Estimate	SE	95% CI
Anticipated Guilt (scenario 1) → Doping Likelihood (scenario 1)	-0.34 ^{***}	0.03	[-0.39, -0.28]
Moral Disengagement → Doping Likelihood (scenario 1)	0.21 ^{***}	0.03	[0.15, 0.28]
Performance Climate → Doping Likelihood (scenario 1)	0.11 ^{***}	0.03	[0.05, 0.18]
Moral Disengagement X Perf. Cl. → Doping Likelihood (scenario 1)	0.10 [*]	0.04	[0.02, 0.17]
Anticipated Guilt (scenario 2) → Doping Likelihood (scenario 2)	-0.40 ^{***}	0.03	[-0.45, -0.34]
Moral Disengagement → Doping Likelihood (scenario 2)	0.18 ^{***}	0.03	[0.12, 0.25]
Performance Climate → Doping Likelihood (scenario 2)	0.11 ^{***}	0.03	[0.05, 0.16]
Moral Disengagement X Perf. Cl. → Doping Likelihood (scenario 2)	0.06 [*]	0.03	[0, 0.12]
Moral Disengagement → Anticipated Guilt (scenario 1)	-0.29 ^{***}	0.04	[-0.36, -0.21]
Moral Identity → Anticipated Guilt (scenario 1)	0.16 ^{***}	0.04	[0.08, 0.23]
Moral Disengagement → Anticipated Guilt (scenario 2)	-0.27 ^{***}	0.04	[-0.34, -0.19]
Moral Identity → Anticipated Guilt (scenario 2)	0.10 ^{**}	0.04	[0.03, 0.18]
Moral Identity → Moral Disengagement	-0.48 ^{***}	0.03	[-0.54, -0.41]

Notes. CI = confidence interval for estimate. * $p < .05$; ** $p < .01$; *** $p < .001$.

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Table 4

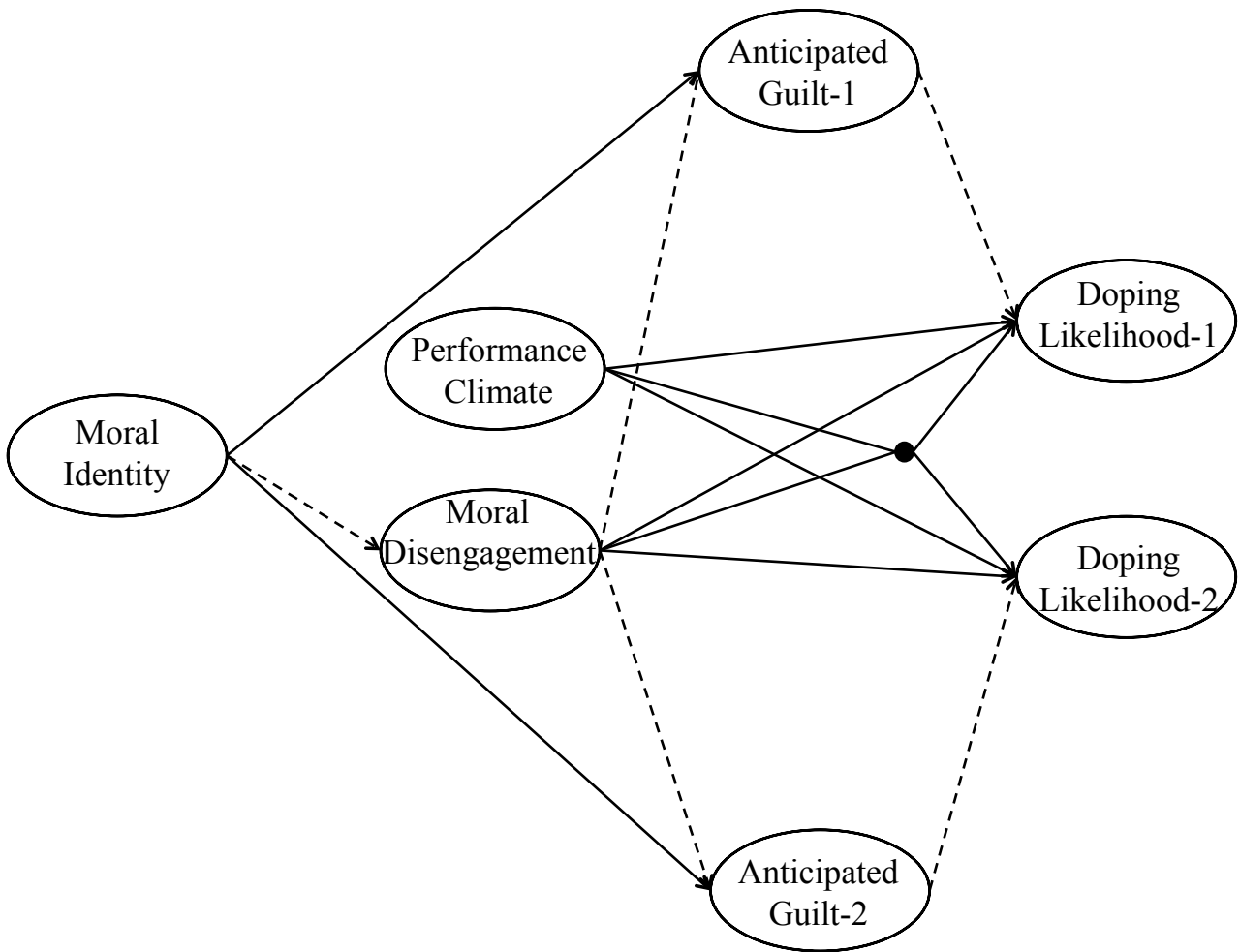
Measurement Invariance Across Sex and Country

	χ^2	<i>df</i>	CFI	RMSEA	SRMR
Sex					
Men, <i>n</i> = 765	1338.77	512	0.933	0.046	0.048
Women, <i>n</i> = 729	1298.30	512	0.939	0.046	0.044
Configural invariance	2637.69	1024	0.936	0.046	0.046
Metric invariance	2702.65	1062	0.935	0.045	0.048
Scalar invariance	2798.80	1088	0.932	0.046	0.048
Country					
UK, <i>n</i> = 506	1235.32	512	0.928	0.053	0.049
Denmark, <i>n</i> = 509	899.90	512	0.951	0.039	0.043
Greece, <i>n</i> = 479	1149.05	512	0.921	0.051	0.052
Configural invariance	3285.52	1536	0.933	0.048	0.048
Metric invariance	3498.04	1612	0.928	0.048	0.056
Scalar invariance	4123.87	1664	0.906	0.054	0.062
Partial scalar invariance	3772.50	1652	0.919	0.051	0.057

Notes. CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean squared residual; *df* = degrees of freedom.

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5 *Figure 1.* Hypothesized model. Solid line denotes hypothesized positive relationships. Dashed line
6 denotes hypothesized negative relationships.

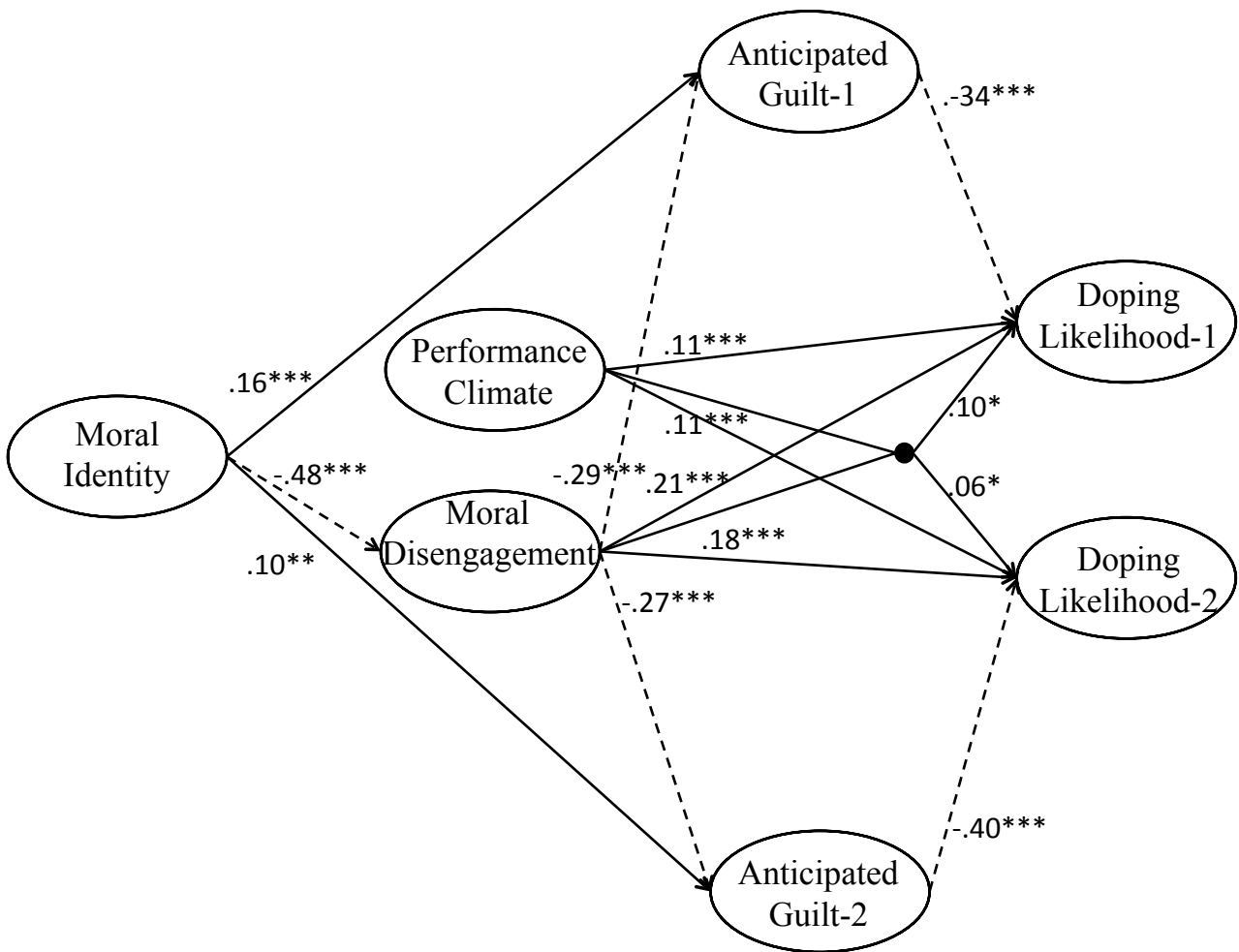
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3 *Figure 2.* SEM results for the structural model. Solid line denotes positive relationships. Dashed
 4 line denotes negative relationships. For anticipated guilt, each item is correlated with its matching
 5 item across the scenarios due to conceptual reasons. For performance climate, a bifactor model is
 6 specified with one general factor (depicted in the figure) and two specific factors (not depicted in
 7 the figure to simplify the figure). Correlations between latent factors were as follows: scenario 1
 8 and 2 doping likelihood, $r = .42, p < .001$; scenario 1 and 2 anticipated guilt, $r = .81, p < .001$;
 9 performance climate general factor and moral identity, $r = -.24, p < .001$; performance climate
 10 specific factor-1 and moral identity, $r = .24, p < .001$; and performance climate specific factor-2 and
 11 moral identity, $r = .03, p = .494$.

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