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ORIGINAL RESEARCH

A Longitudinal Examination of the Relations Between Moral Disengagement and Antisocial Behavior in Sport

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Moral disengagement (MD) has been positively associated with antisocial behavior (AB) in sport. However, the longitudinal associations between MD and AB are unexamined to date. Adopting a three-wave cross-lagged panel design, the authors examined the reciprocal relations between MD and two forms of AB (i.e., toward opponents and teammates) across a competitive season with a sample of 407 team-sport athletes ($M_{age} = 15.7$ years) from Canada. Using structural equation modeling, the authors found strong positive autoregressive effects for MD and both forms of AB across both time periods. They also identified strong positive synchronous correlations between MD and both types of AB at each time point. Finally, cross-lagged effects were only found between MD and AB toward opponents; effects from MD to AB toward opponents were stronger than the reciprocal effects. These findings contribute important knowledge on the regulation of AB in sport.

***Keywords**:* aggression, cross-lagged, panel analysis, rationalization, youth

Participation in sport can have numerous benefits for physical and psychological health in youth (Eime, Young, Harvey, Charity, & Payne, 2013). However, youth sport is not without its ills, as research has provided evidence of antisocial behavior (AB) occurring in this context (e.g., Kavussanu, Seal, & Phillips, 2006). As such, it is important that researchers identify psychosocial factors that may facilitate ABs in at-risk sports, so that appropriate interventions to deter such behavior can be developed. However, at present, the relevant evidence base is limited by a lack of longitudinal research (Boardley, 2019). Thus, research that focuses on the temporal relations between AB and relevant psychosocial factors in sport is required. The overarching aim of the current research was to contribute to this research need.

Antisocial behavior in sport has been defined as voluntary behavior intended to harm or disadvantage another (Sage, Kavussanu, & Duda, 2006). Research examining the dimensionality of AB in sport identified two associated but distinct forms (Kavussanu & Boardley, 2009). One consists of antisocial behaviors toward opponents (ABO; e.g., trying to injure an opponent), whereas the other comprises acts toward teammates (e.g., verbally abusing a teammate). While the former type comprises both physical and verbal behaviors, the latter only consists of verbal acts. Of importance though is that both forms of AB include aggressive behaviors, defined in sport as overt verbal or physical behavior, chosen with the intent of causing injury and with the capacity to cause psychological or physical injury to another living being (Husman & Silva, 1984).

Observational, questionnaire-based, and qualitative research provides evidence of AB in youth sport. For instance, Kavussanu et al. (2006) demonstrated that the frequency of AB (e.g., late tackle, provoking opponents, body checking) increased with age across three age categories (12–13 years, 14–15 years, and 16–17 years) in male soccer players. On average, in the oldest age category, 15 antisocial acts occurred per hour per team. In a separate paper using the same sample, players reported mean levels of self-reported ABO of 2.51 on a scale from 1 (*never*) to 5 (*very often*) across all matches played to that point in the season (Kavussanu, 2006). Similarly, Bruner et al. (2018) reported a comparable average frequency (i.e., $M = 2.37$) for self-reported ABO in a study with youth ice hockey players. Finally, qualitative research also provides evidence of AB in youth sport. Across two studies with youth ice hockey players, Bruner and colleagues provided detailed examples of antisocial verbal and physical behaviors occurring on a regular basis (Bruner, Boardley, Allan, Forrest, et al., 2017; Bruner, Boardley, Allan, Root, et al., 2017). Thus, research utilizing a range of methodological approaches supports the need to further understand the psychosocial factors leading to AB in youth sport.

One psychosocial factor with the potential to help explain AB in sport is moral disengagement (MD). "Moral disengagement" is a collective term for eight psychosocial mechanisms that allow people to justify and rationalize harmful behavior (Bandura, 1991). The mechanisms are moral justification, euphemistic labeling, advantageous comparison, diffusion of responsibility, displacement of responsibility, distortion of consequences, dehumanization, and attribution of blame. As an example, moral justification represents detrimental conduct made personally and socially acceptable by portraying it in the service of a valued social or moral purpose (Bandura, 1991); in sport, this is seen when a player says she/he deliberately injured an opponent to protect a teammate. Another exemplar mechanism is displacement of responsibility, which reflects people viewing their actions as arising from social pressures or the directives of others, rather than as something for which they are personally responsible (Bandura, 1991); an example in sport is a player suggesting she/he is not responsible for injuring an opponent because he/she was told to do it by his/her coach. A full description of all mechanisms, including sport-specific examples, can be found in Boardley and Kavussanu (2007). According to Bandura (1991), use of one or more mechanisms facilitates damaging behavior by

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weakening or eliminating self-regulatory processes (i.e., anticipation of distasteful emotions such as guilt or shame) when engaging in such acts. Thus, MD may facilitate AB in sport by allowing players to engage in such behavior without experiencing emotions that normally deter such action.

Research in sport supports the possibility that MD facilitates AB. Specifically, researchers have identified moderate-to-strong positive associations between MD and ABO and antisocial behavior toward teammates (ABT) across a range of sports, and qualitative research has provided athlete accounts of MD when explaining antisocial acts in sport (see Boardley & Kavussanu, 2011, for a review). However, to date these links have only been identified with cross-sectional data, and as such, it is not known whether changes over time in athletes' MD correspond with expected changes in AB in sport.

Outside of sport, empirical evidence does support temporal links between MD and aggressive behavior. For instance, Paciello, Fida, Tramontano, Lupinetti, and Caprara (2008) investigated developmental trajectories in MD and aggression and violence with 14- to 20-year-old adolescents in Italy, finding support for four major developmental trajectories. Of these, a trajectory reflecting maintenance of higher levels of MD over time was positively linked with more frequent aggression and violence in late adolescence. Subsequently, Hyde, Shaw, and Moilanen (2010) studied developmental precursors of MD as well as its links with later AB during childhood and adolescence with participants from low-income families in the United States. Of direct interest presently, they found MD at age 15 was a moderate positive predictor of AB at age 16–17 years. Furthermore, Muratori et al. (2017) found that across a 12-month period, earlier MD was predictive of later callous–unemotional traits—traits linked with aggression and violence—in a sample of adolescents with a disruptive behavior disorder in Italy, even when controlling for earlier MD and callous–unemotional traits. Finally, Sticca, Ruggieri, Alsaker, and Perren (2013) discovered MD had moderate positive associations with both cyberbullying and traditional bullying across a 6-month period in Swiss seventh graders. Thus, longitudinal research outside of sport has established positive links between MD and later aggressive and AB across several studies.

Although Bandura's (1991) theory proposes that MD precedes harmful action, reciprocal effects of AB on MD may also occur. For example, athletes may increase the frequency with which they engage in AB in response to situational factors (e.g., exposure to aggressive role models, reinforcement of such behavior by a coach). To reduce unpleasant emotional reactions as a result of increased engagement in such acts, individuals may increase their levels of MD to justify and rationalize their enhanced engagement in antisocial action. Thus, it is possible that enhanced frequency of AB results in increased levels of MD in sport.

Nonsport research supports the possibility that changes in transgressive behavior may lead to changes in MD. For instance, Caprara et al. (2014) conducted research in Italy that examined the reciprocal relations between MD and aggression and violence across four time points spanning adolescence ($M_{\text{age}} = 17$ years) and young adulthood ($M_{\text{age}} = 25$ years). Interestingly, in addition to positive weak-to-moderate cross-lagged effects of MD on later aggression and violence being seen across all three time transitions, they also detected a weak positive effect of aggression and violence on MD between Time 2 and Time 3. Subsequently, Visconti, Ladd, and Kochenderfer-Ladd (2015) examined U.S. school children's MD and aggression across three time points, collecting data from children (i.e., MD) and teachers (i.e., children's aggression) at the start of fourth, fifth, and sixth grades. Cross-lagged panel analysis demonstrated weak positive cross-lagged effects of MD on aggression between Time 1 and Time 2 and Time 2 and Time 3. In addition, they also found equivalent cross-lagged effects of aggression on subsequent MD. Most recently, Sijtsema, Garofalo, Jansen, and Klimstra (2019) examined the longitudinal interrelations between MD and AB with Dutch adolescents (M_{age} for T1 = 13.57 years). Collecting data across three annual waves, cross-lagged panel analyses identified positive cross-lagged effects of AB on MD between Time 1 and Time 2 and Time 2 and Time 3. However, these effects were only observed for boys and not girls. No cross-lagged effects were seen between MD and later AB. As the review of evidence demonstrates, research to date examining the cross-lagged effects between MD and AB has been equivocal, with one study showing stronger support for cross-lagged effects of MD on AB, another finding support for effects of AB on MD only, and one demonstrating effects in both directions. However, to date, researchers have not longitudinally tested such reciprocal effects between MD and AB in sport.

Research examining the reciprocal temporal effects between MD and AB in sport is needed, given the unique nature of sport as a context for moral action. Specifically, based on the theorizing of Bredemeier and Shields (1986), researchers have provided empirical support for the presence of bracketed morality (i.e., the temporary adoption of egocentricity during sport participation in comparison with that adopted during everyday life; Bredemeier & Shields, 1986) in sport. For example, studies have shown contextual differences in moral reasoning between sport and nonsport contexts (e.g., Bredemeier, 1995; Bredemeier & Shields, 1986), as well as differences in AB (Kavussanu, Boardley, Sagar, & Ring, 2013) in and out of sport. These studies show a tendency for lower moral reasoning and more frequent AB in sport compared with nonsport contexts. These observed differences in moral functioning in sport compared with nonsport contexts highlight the need for sport-specific research examining the interrelations between MD and AB over time. Such research would provide important information regarding the directional effects between MD and AB in sport; therefore, informing future attempts to develop behavioral models of AB in sport as well as interventions aimed at reducing harmful action in sport.

The Current Research

While extant research has established consistent positive relations between MD and aggressive behavior in sport, research examining reciprocal relations between the two variables is limited to nonsport research. Thus, researchers have not longitudinally examined the reciprocal relations between MD and AB in sport. As such, the aim of the current research was to examine the temporal interplay between MD and AB in youth sport participants.[1] Youth sport participants represent an important study population as they are undergoing a key life stage during which they not only experience much greater autonomy over their actions, but are also influenced by developmental changes to their cognitive, affective, and behavioral systems (Casey, Jones, & Hare, 2008; Steinberg, 2005). As such, understanding the reciprocal effects of cognitive and behavioral factors during this period is of particular importance. In achieving its aims, the current study would extend work on AB to an important developmental period within a novel context.

Based upon the extant literature, we forwarded hypotheses regarding the interrelations between variables over time. First, informed by research showing the stability of aggression over time, we hypothesized that earlier AB would be a strong positive contributor to later AB (Adams, Bukowski, & Bagwell, 2005; Caprara et al., 2014; Sijtsema et al., 2019; Visconti et al., 2015). Similarly, based on existing evidence, we anticipated earlier MD would have a strong influence on later MD (Caprara et al., 2014; Sijtsema et al., 2019; Visconti et al., 2015). Finally, due to mixed findings in past research, we did not forward a definitive hypothesis for cross-lagged effects between MD and AB (Caprara et al., 2014; Sijtsema et al., 2019; Visconti et al., 2015). However, if any such effects were identified, based on theory we expected stronger effects of MD on AB in comparison with the opposite effects (Bandura, 1991; Caprara et al., 2014).

Methods

Participants

Participants were male ($n = 257$) and female ($n = 150$) athletes competing in high school soccer ($n = 47$), volleyball ($n = 86$), lacrosse ($n = 12$), ice hockey ($n = 42$), rugby ($n = 27$), American football ($n = 58$), or basketball ($n = 135$) in Canada. Athletes ranged in age from 13 to 19 years ($M = 15.7$, $SD = 1.3$) and on average engaged in 6.5 hr ($SD = 3.0$) of formal practice per week. This sample represented the 407 athletes who completed the questionnaire pack at all three times points (see procedures) out of the original 426 athletes who completed it at Time 1; this represents an attrition rate of 4.5%.

Measures

AB in Sport. Two subscales from the Prosocial and Antisocial Behavior in Sport Scale (Kavussanu & Boardley, 2009) were used to assess reported antisocial sport behavior toward teammates (five items; e.g., "verbally abused a teammate") and opponents (eight items; e.g., "deliberately fouled an opponent"); behaviors toward teammates are all verbal in nature, whereas behaviors toward opponents are verbal or physical. Players were presented with the items describing ABs and were asked to report how often they had engaged in each behavior this season on a scale anchored by 1 (*never*) and 5 (*very often*). Evidence for the content, factorial, concurrent, and discriminant validity of scores obtained with the Prosocial and Antisocial Behavior in Sport Scale has been provided (Kavussanu & Boardley, 2009), and the antisocial teammate and opponent behavior subscales have shown good to very good levels of internal consistency ($\alpha = .83$ and $\alpha = .86$, respectively).

Moral Disengagement. The Moral Disengagement in Sport Scale—Short (Boardley & Kavussanu, 2008) was used to assess athletes' sport MD. Athletes were asked to read a series of eight statements describing thoughts and feelings relating to competitive sport and to indicate their level of agreement from 1 (*strongly disagree*) to 7 (*strongly agree*). An example item is "Insults among players do not really hurt anyone." Scores obtained with the The Moral Disengagement in Sport Scale—Short have demonstrated good levels of internal consistency ($\alpha = .80–.85$) and their factorial, convergent, and concurrent validity have been supported (Boardley & Kavussanu, 2008).

Procedures

After obtaining approval through the research ethics board at Queens University, we invited coaches from three school boards in Canada to participate in the study. Contact with approximately 80 coaches involved presentations at school-board athletic meetings and invitations to speak with high school coaches at their respective schools. Participants were recruited from the high school teams of interested coaches, and players from 35 teams participated. The third author or a research assistant provided an explanation of the study at the beginning or end of a scheduled practice session at the beginning of the season. Athletes were presented with an information sheet, an athlete assent form, and a parental consent form. Informed assent and parental consent were obtained from all participants who volunteered to take part. Participants completed a paper questionnaire on the study variables and demographic questions in person at the beginning (2 weeks), middle (6–8 weeks), and end (12–16 weeks) of the regular season.

Results

Data Screening, Descriptive Statistics, Scale Reliabilities, and Correlations

There were just eight missing data points out of the 34,188 responses, representing just 0.02% of the study data. Normality of all study variables was evidenced by skewness and kurtosis values of $<|2|$. Descriptive statistics, scale reliabilities, and correlations between primary variables are presented in Table 1. Internal consistencies were estimated using Raykov composite reliabilities (Raykov, 2009). As can be seen in Table 1, the scales demonstrated good to excellent levels of reliability, with all values well above 0.70. Furthermore, positive strong to very strong bivariate correlations between all study variables were observed (see Cohen, 1992). However, notably the relations between AB and MD when both variables were assessed at the same time point were consistently

Table 1 Descriptive Statistics, Scale Reliabilities, and Correlations for All Study Variables ($N = 407$)

	M	*SD*	Range	1	2	3	4	5	6	7	8	9
1. ABO T1	2.12	0.78	1.00–4.75	(.86)								
2. ABT T1	1.87	0.69	1.00–4.40	.66*	(.82)							
3. MD T1	2.99	1.12	1.00–5.75	.56*	.49*	(.83)						
4. ABO T2	2.17	0.82	1.00–5.00	.70*	.48*	.46*	(.88)					
5. ABT T2	1.93	0.73	1.00–5.00	.49*	.60*	.35*	.66*	(.83)				
6. MD T2	2.99	1.23	1.00–7.00	.50*	.40*	.68*	.62*	.49*	(.88)			
7. ABO T3	2.28	0.87	1.00–4.88	.63*	.41*	.46*	.71*	.47*	.53*	(.89)		
8. ABT T3	2.06	0.80	1.00–4.80	.47*	.53*	.34*	.52*	.65*	.40*	.68*	(.87)	
9. MD T3	3.04	1.26	1.00–7.00	.45*	.35*	.62*	.55*	.40*	.72*	.67*	.53*	(.88)

Note. Raykov (2009) composite reliability coefficients are presented on the diagonal. Possible scale ranges: 1–5 for ABO and ABT and 1–7 for MD. ABO = antisocial behavior toward opponents; ABT = antisocial behavior toward teammates; MD = moral disengagement; T1 = Time 1; T2 = Time 2; T3 = Time 3.
*$p < .01$.

stronger than when variables from different time points were correlated. In addition, relations involving the same construct were reliably stronger than those between different constructs.

Cross-Lagged Panel Analyses

To examine whether MD predicted longitudinal changes in ABO and/or ABT, and/or vice versa, 2 three-wave cross-lagged panel analyses were conducted (Cook & Campbell, 1979; Kenny & Harackiewicz, 1979). This analytical approach was appropriate because our research aims were relevant to the examination of covariance stability over time (see McArdle, 2009), rather than investigation of within-person change and between-person differences in within-person change (Stenling, Ivarsson, & Lindwall, 2016). Our analytical approach was also consistent with that adopted in the three studies upon which we established the primary rationale and hypotheses for our study (Caprara et al., 2014; Sijtsema et al., 2019; Visconti et al., 2015). The analyses involve testing models containing three components. The first of these is synchronous correlations: the associations among study variables within each particular time point (e.g., MD at T1 with ABO at T1). These indicate the magnitude and direction of the cross-sectional relations between variables. The second component is the autoregressive paths: the predictive paths for the same variable assessed at different time points (e.g., MD at T1 to MD at T2). These paths reflect the stability of variables across time. The third component is the cross-lagged paths: the predictive paths between different variables across time points (e.g., MD at T1 to ABO at T2). These represent the proportion of change in one variable across time points uniquely explained by another, once synchronous correlations and autoregressive paths are accounted for. Thus, through interpretation of the cross-lagged effects, we aimed to determine the reciprocal causal effects between MD and ABO/ABT across three time points spanning a competitive season.

Analyses were conducted using Mplus (version 7.2; Muthén and Muthén, 1998–2015). The robust maximum likelihood estimation was used to account for missing data under the missing-at-random assumption (Enders, 2010; Muthén and Muthén, 1998–2015). Based on relevant guidance (Bentler, 2007), we included various fit indices: chi-square (χ^2), comparative-fit index (CFI), standardized root mean square residual (SRMR), and root mean square error of approximation (RMSEA). CFI ≥ .90 and RMSEA ≤ .08 are indicative of adequate model fit, whereas CFI ≥ .95 and RMSEA ≤ .05 signify good fit (Hu & Bentler, 1999).

To answer the main research questions, five competing models were tested (Madigan, Stoeber, & Passfield, 2015; Nordin-Bates, Hill, Cumming, Aujla, & Redding, 2014; Zacher & de Lange, 2011). First, a temporal stability model (M1) was tested to provide a baseline for comparison with subsequent models; this included synchronous and autocorrelations but not cross-lagged correlations. Second, a cross-lagged model (M2) in which MD affected AB over time but without reciprocal temporal effects was specified; this model included cross-lagged effects between MD at T1 and AB at T2 and MD at T2 and AB at T3. Third, a reverse cross-lagged model (M3) in which AB affected MD over time, but without the specification of the reciprocal effects; this model included cross-lagged effects between AB at T1 and MD at T2 and AB at T2 and MD at T3. Fourth, a constrained reciprocal cross-lagged effects model (M4) in which MD and AB affected each other equally over time was specified; this model included all possible cross-lagged effects between T1 and T2 and T2 and T3, but with the paths between MD and AB constrained to be equal. Finally, an unconstrained reciprocal cross-lagged effects model (M5) was specified; this model was identical to Model M4 except that no constraints were imposed on causal paths between time points. To compare model fit between the five models, χ^2 difference tests were conducted.

Measurement Model. Before testing the five models, we tested the measurement model at each time point (see James, Mulaik, & Brett, 1982). Thus, for the data from each time point, we specified a model in which the posited relations of the observed variables were allowed to intercorrelate with their underlying latent constructs. First, for the MD and ABO T1 data, the model had a good fit, $\chi^2(103) = 198.54$, $p \leq .001$; CFI = .95; RMSEA = .05; SRMR = .04. Next, for the MD and ABO T2 data, the model had a good fit, $\chi^2(103) = 227.81$, $p \leq .001$; CFI = .95; RMSEA = .06; SRMR = .04. Finally, for the MD and ABO T3 data, the model had an adequate fit, $\chi^2(103) = 337.94$, $p \leq .001$; CFI = .91; RMSEA = .08; SRMR = .04. Then, for the MD and ABT T1 data, the model had a fairly good fit, $\chi^2(64) = 161.22$, $p \leq .001$; CFI = .93; RMSEA = .06; SRMR = .04. Next, for the MD and ABT T2 data, the model had a good fit, $\chi^2(64) = 163.41$, $p \leq .001$; CFI = .94; RMSEA = .06; SRMR = .04. Finally, for the MD and ABO T3 data, the model had a good fit, $\chi^2(64) = 194.18$, $p \leq .001$; CFI = .94; RMSEA = .07; SRMR = .04. Given the fit of each measurement model was at least adequate, we proceeded with the structural analyses. When testing the five models, equality constraints over time were imposed on factor loadings and indicator intercepts to establish measurement invariance (Stenling et al., 2016), and each indicator was allowed to correlate over time to account for indicator-specific variance (Little, 2013).

Structural Models. The fit indices and model comparisons for the five models are reported in Tables 2 and 3.[2] The fit indices obtained

Table 2 Fit Indices and χ^2 Difference Tests of Nested Models for ABO Model ($N = 407$)

Variable	χ^2	*df*	CFI	RMSEA	SRMR	Comparison	$\Delta\chi^2$	Δdf
No cross-lagged effects (M1)	1,613.80**	1053	.94	.04	.06			
Cross-lagged MD to AB (M2)	1,600.55**	1051	.94	.04	.05	M1 vs. M2	13.25**	2
Cross-lagged AB to MD (M3)	1,602.49**	1051	.94	.04	.05	M1 vs. M3	11.31**	2
Reciprocal cross-lagged constrained (M4)	1,597.45**	1052	.94	.04	.05	M1 vs. M4	16.35**	1
Reciprocal cross-lagged unconstrained (M5)	1,595.91**	1049	.94	.04	.05	M1 vs. M5	17.89**	4
						M2 vs. M5	4.64	2
						M3 vs. M5	6.58*	2
						M4 vs. M5	1.54	3

Note. ABO = antisocial behavior toward opponents; AB = antisocial behavior; CFI = comparative-fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual; MD = moral disengagement; AB = antisocial behavior.
*$p < .05$. **$p < .01$.

demonstrate good levels of fit across all 10 models tested. For the models concerning ABO (see Table 2), model comparisons based upon χ^2 difference tests indicated that those specifying cross-lagged paths (i.e., M2–M5) had improved fit over the one with no cross-lagged paths (i.e., M1).[3] However, as there was no significant difference between the constrained (i.e., M4) and unconstrained (i.e., M5) models, we accepted M4 as our final model and interpreted the parameter estimates from this model (see Figure 1 and Table 4). First, in terms of the autoregressive paths, these were statistically significant and very strong for MD and ABO, demonstrating high stability of both variables across time. Next, the synchronous correlations showed a strong positive association between MD and ABO at all three time points. Finally, the cross-lagged paths from T1 to T2 and T2 to T3 were positive and moderately strong for the MD to ABO paths and positive and very weak for the ABO to MD paths.

For the models relevant to ABT (see Table 3), model comparisons based upon χ^2 difference tests showed no improvement in fit for those specifying cross-lagged paths (i.e., M2–M5) in comparison with the model with no cross-lagged paths (i.e., M1). As such, we accepted M1 as our final model and interpreted the parameter estimates from this model (see Figure 2 and Table 5). First, regarding autoregressive paths, these were statistically significant and very strong for MD and ABT, demonstrating high stability of both variables across time. Next, the synchronous correlations showed a strong positive association between MD and ABT at all three time points. Finally, the acceptance of this model provides no evidence of cross-lagged effects between MD and ABT from T1 to T2 or T2 to T3.

Discussion

Through the current study, we aimed to investigate the interrelations between MD and AB over three time points across a competitive season. Using structural equation modeling to examine a series of models, we identified several important effects. First, consistent with our hypotheses, we found earlier AB was a strong positive predictor of later AB, and earlier MD had strong positive links with later MD. Next, MD predicted longitudinal changes in ABO from the start to the middle of the season, and from the middle to the end of the season, with weak positive effects over both time periods. In contrast, ABO did not meaningfully predict changes in MD across either of the time periods studied, with only very weak positive effects detected over both time periods. Furthermore, no significant cross-lagged effects were found between MD and ABT. Through these findings, this study has made important novel contributions to our understanding of the intrapersonal processes that govern youth AB in sport.

Consistent with expectations, for both ABO and ABT, earlier AB was a strong positive predictor of future AB. Thus, those athletes reporting more frequent ABO and ABT at earlier time points were also the ones most likely to report being antisocial more frequently at the later time points. Although such relations have not previously been examined in sport-based research, these findings are consistent with research on AB outside of sport. For instance, all three studies utilizing cross-lagged panel analyses reported autocorrelations demonstrating high levels of stability in aggression, violence, and AB across periods of up to 4 years (Caprara et al., 2014; Sijtsema et al., 2019; Visconti et al., 2015). Thus,

Table 3 Fit Indices and χ^2 Difference Tests of Nested Models for ABT Model ($N = 407$)

Variable	χ^2	*df*	CFI	RMSEA	SRMR	Comparison	$\Delta\chi^2$	Δdf
No cross-lagged effects (M1)	1,049.41**	678	.95	.04	.05			
Cross-lagged MD to AB (M2)	1,045.30**	676	.95	.04	.05	M1 vs. M2	4.11	2
Cross-lagged AB to MD (M3)	1,051.17**	676	.95	.04	.05	M1 vs. M3	1.76	2
Reciprocal cross-lagged constrained (M4)	1,045.99**	677	.95	.04	.05	M1 vs. M4	3.42	1
Reciprocal cross-lagged unconstrained (M5)	1,047.35**	674	.95	.04	.05	M1 vs. M5	2.06	4
						M2 vs. M5	2.05	2
						M3 vs. M5	3.82	2
						M4 vs. M5	1.36	3

Note. AB = antisocial behavior; ABT = antisocial behavior toward teammates; CFI = comparative-fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual; MD = moral disengagement.
$^*p < .05$. $^{**}p < .01$.

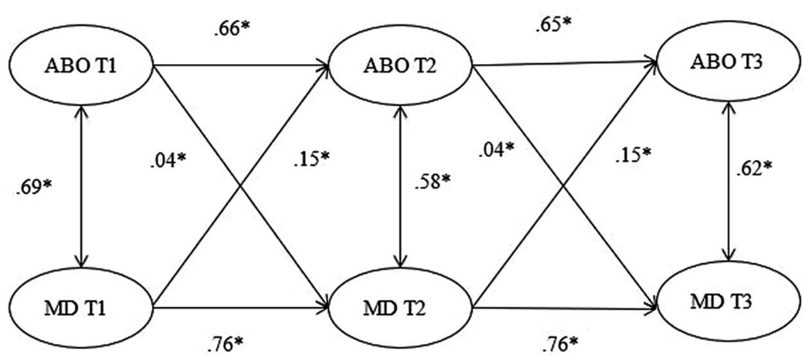

Figure 1 — Three-wave cross-lagged panel model linking ABO and MD across time (M4). ABO = antisocial behavior toward opponents; MD = moral disengagement; T1 = Time 1; T2 = Time 2; T3 = Time 3. $^*p < .01$.

alongside research from outside of sport, the present findings suggest that antisocial and aggressive behaviors have a high degree of stability. However, although based on this evidence it is reasonable to expect the frequency of ABT and ABO to endure over time, nonsport research suggests aggressive behavior may be malleable at least to some extent. Specifically, while Adams et al. (2005) found aggression to be generally stable over a 6-month period in American early adolescents, stability was moderated by the nature of adolescents' friendships and this was especially so for those initially high in aggression. Specifically, those who interacted with aggressive friends over the 6 months maintained high levels of aggression, whereas those who interacted with friends low in aggression decreased in their aggression over the period of study. Thus, these findings suggest it may be possible that despite the high levels of stability detected presently, the frequency of AB could be influenced by athletes' exposure to aggressive conduct over time. However, future research is needed to examine this within the sport context.

Also, in alignment with our hypotheses, MD at earlier time points was a strong positive predictor of MD at subsequent time points; those with higher MD at earlier time points were more likely to have higher MD in the future. This finding is consistent with those of Caprara et al. (2014), Sijtsema et al. (2019), and Visconti et al. (2015), who found strong autocorrelations for MD across time periods of up to 4 years. Similarly, Teng, Nie, Pan, Liu, & Guo (2017) found Chinese secondary school children's MD at Time 1 was a moderate-to-strong positive predictor of their MD 5 months later. Thus, the present findings are part of a growing evidence base suggesting MD is a relatively stable cognitive orientation. Despite this, research suggests that MD is still susceptible to contextual influences (see Moore, 2015). Thus, it is important that future work identifies which contextual influences are most effective in reducing MD. For instance, past research has negatively linked athletes'

Table 4 Cross-Lagged Panel Model Estimates for ABO (M4)

	Cross-lagged panel Model 1		
	Estimate[a]	*SE*	*p*
Autoregressive paths			
ABO T1–ABO T2	0.66	0.05	<.001
ABO T2–ABO T3	0.65	0.04	<.001
MD T1–MD T2	0.76	0.03	<.001
MD T2–MD T3	0.76	0.03	<.001
Cross-lagged paths			
ABO T1–MD T2	0.04	0.01	<.001
ABO T2–MD T3	0.04	0.01	<.001
MD T1–ABO T2	0.15	0.04	<.001
MD T2–ABO T3	0.15	0.04	<.001
Synchronous correlations			
ABO T1–MD T1	0.69	0.04	<.001
ABO T2–MD T2	0.58	0.07	<.001
ABO T3–MD T3	0.62	0.07	<.001
	R^2		
ABO T2	.58		
ABO T3	.58		
MD T2	.62		
MD T3	.63		

Note. ABO = antisocial behavior toward opponents; MD = moral disengagement; T1 = Time 1; T2 = Time 2; T3 = Time 3.
[a]Standardized coefficients.

Table 5 Autoregressive and Synchronous Estimates for ABT (M1)

	Estimate[a]	*SE*	*p*
Autoregressive paths			
ABT T1–ABT T2	0.67	0.05	<.001
ABT T2–ABT T3	0.72	0.04	<.001
MD T1–MD T2	0.77	0.04	<.001
MD T2–MD T3	0.78	0.03	<.001
Synchronous correlations			
ABT T1–MD T1	0.59	0.05	<.001
ABT T2–MD T2	0.51	0.07	<.001
ABT T3–MD T3	0.56	0.09	<.001
	R^2		
ABT T2	.49		
ABT T3	.52		
MD T2	.60		
MD T3	.60		

Note. ABT = antisocial behavior toward teammates; MD = moral disengagement; T1 = Time 1; T2 = Time 2; T3 = Time 3.
[a]Standardized coefficients.

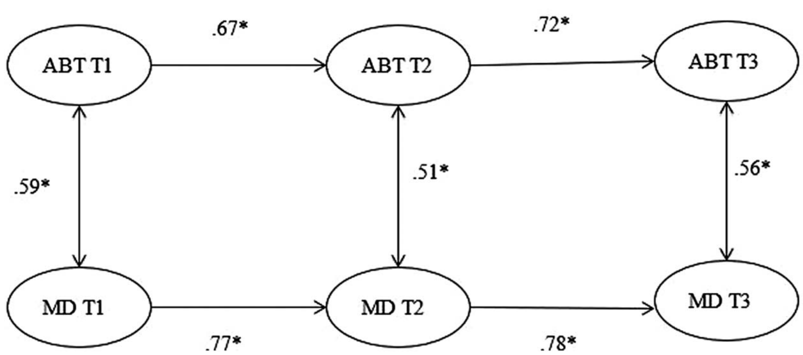

Figure 2 — Three-wave panel model linking ABT and MD (M1). ABT = antisocial behavior toward teammates; MD = moral disengagement; T1 = Time 1; T2 = Time 2; T3 = Time 3. *$p < .01$.

perceptions of their coach's character-building competency (i.e., a coach's belief in his or her ability to influence athletes' personal development and positive attitudes toward sport; Feltz, Chase, Moritz, & Sullivan, 1999) with their MD (Boardley & Kavussanu, 2009). Thus, sustained exposure to coach behaviors reflecting high levels of character-building competency may reduce athletes' MD. Research is needed that helps identify contextual influences that reduce athletes' MD.

Regarding cross-lagged effects, for ABO, our findings were largely in line with our predictions. Specifically, while we detected significant cross-lagged effects from MD to ABO and from ABO to MD across both time periods, the effects were stronger—and arguably only meaningful—from MD to ABO. While weak, the magnitudes (i.e., 0.15) of the cross-lagged effects from MD to ABO were in line with the past research outside of sport. Namely, Caprara et al. (2014) found cross-lagged effects of MD on engagement in aggression and violence between 0.13 and 0.18 in a sample of young adults in Italy, and Visconti et al. (2015) detected cross-lagged effects of 0.11 and 0.15 for MD on aggression with children in the United States. These findings are in line with Bandura (1991), which proposes that MD facilitates AB by weakening or eliminating anticipated unpleasant emotional consequences of harmful behavior.

In terms of the lack of a meaningful cross-lagged effect from ABO to MD, our findings are again consistent with Bandura's (1991) proposition that MD facilitates AB by rationalizing acts prior to their occurrence, rather than acting as a means of addressing unpleasant emotions after the event. However, as outlined earlier, empirical evidence has proved inconsistent on this, with some studies finding weak positive cross-lagged effects from aggression to MD (Visconti et al., 2015), others finding a mixture of significant and nonsignificant cross-lagged effects of aggression and violence on MD (Caprara et al., 2014), and others finding significant cross-lagged effects of AB on MD for males but not for females (Sijtsema et al., 2019). Recent experimental research may help elucidate why findings have been inconsistent in this regard. Specifically, Tillman, Gonzalez, Whitman, Crawford, and Hood (2018) adopted a scenario-based laboratory study to provide support for their assertion that, in addition to using MD prior to committing an unethical act, individuals can morally disengage to reduce emotional duress on learning of the consequences of their actions subsequent to an act. However, for such postact MD to occur, culprits must become aware of some negative consequences stemming from their actions only after the event and being unaware of them prior to the event (see Tillman et al., 2018, for more details). If this is not the case—and perpetrators are aware of all the consequences of their actions before acting unethically—then it is likely they will have already fully rationalized the consequences through preact MD prior to action. As such, it may be the case that unanticipated consequences are more common in some contexts than in others, and this explains the lack of consistency on cross-lagged effects from harmful behavior to MD. Based on the current evidence, it does not seem that postact MD is resulting from athletes' engagement in AB on a consistent basis within sport.

Regarding ABT, we found no cross-lagged effects between MD and ABT in either direction. The contrasting findings for ABT in comparison with ABO may be due to differences in the nature of antisocial acts athletes engage in toward teammates compared with opponents (see Kavussanu & Boardley, 2009). Specifically, while ABO involves both verbal and physical antisocial acts, ABT only includes verbal acts of aggression. It is possible that verbal aggression is more automatically legitimized within sport than physical aggression; therefore, lessening the need for MD to rationalize engagement in it. This possibility is supported by research, which has shown that harm stemming from verbal aggression can be legitimized by game rules or procedures, whereas physical aggression appears more resilient to such contextual influences (Helwig, Hildebrandt, & Turiel, 1995). As a result, there may be a stronger causal link between MD and physical aggression than with verbal aggression in the sport context.

Limitations and Future Directions

Despite making important contributions to knowledge, our findings should be considered alongside relevant study limitations. First, while based upon key time points during the competitive season, our time lags were not as long as some longitudinal investigations of MD and aggressive behavior (i.e., Caprara et al., 2014). It is possible that our findings may have been different if we collected data across longer time periods. As such, research examining the strength and consistency of effects across different time gaps is needed. Further, although now we have some understanding of the temporal reciprocal interplay between MD and AB in sport, future researchers could employ latent variable growth models to examine changes in MD and AB within athletes' developmental trajectories.

It is also important to acknowledge the limitation imposed through our assessment of self-reported AB. It is possible—due to social desirability and memory recall effects—that some participants misreported their engagement in AB. In the future, it would be interesting to examine whether the present results are replicated using other indices of AB such as other-reported (e.g., parent or coach reports) or observed (i.e., via video recording and behavioral coding) behavior. Also noteworthy is that the cross-lagged effects detected were quite small. However, these effects should be considered meaningful given that they represent effects over time that account for synchronous and autoregressive effects between variables. Finally, future researchers should consider including possible covariates of MD and AB (e.g., irascibility, rumination; see Bandura, Barbaranelli, Caprara, & Pastorelli, 1996) to further our understanding on psychosocial factors influencing AB.

Conclusion

The present findings represent an important progression in research seeking to further understanding on factors influencing AB in sport, as well as contributing more broadly to empirical work supporting the relevance of Bandura's (1991) theorizing for our understanding of AB. This research provided the first empirical evidence in sport research of strong autoregressive links over time for AB and MD. In addition, the contrasting cross-lagged effects for ABO compared with ABT highlighted the importance of distinguishing between different types of AB. Finally, the identification of stronger cross-lagged effects from MD to AB in comparison with the opposing effects provides support for Bandura's (1991) contention that MD is an important prerequisite of harmful behavior, as opposed to being an outcome of it.

Notes

1. While researchers have also linked MD with prosocial behavior, such associations are generally much weaker and less consistent than those between MD and AB (see Boardley & Kavussanu, 2011). For this

reason, we chose to focus solely on the reciprocal relations between MD and AB.

2. In response to a reviewer's comment, we retested the final model for both sets of analyses while controlling for gender. Controlling for gender had no meaningful impact on the model fit or parameter estimates.

3. Please note ΔCFI suggests equivalence of model fit for these model comparisons. Our acceptance of model M4 was based upon the χ^2 difference test and would not have been supported if we had used ΔCFI as our criterion.

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