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EMPIRICAL RESEARCH

Longitudinal Relationships between Bullying and Moral Disengagement among Adolescents

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Abstract Moral disengagement is a series of cognitive processes used to disengage moral standards to achieve absolved guilt and permit immoral conduct and has been found to be an important connection to bullying and aggressive behaviors among adolescents. This study examined the longitudinal relationship between moral disengagement and bullying behavior among a group of adolescents from fifth grade to ninth grade ($n = 1180$, mean age = 12.2, SD = 1.29, 46.5 % female, 80.2 % Caucasian/White, 7.1 % Black/African American, 5.4 % Latino/Hispanic, 2.4 % Asian American, and 1.7 % other) over three semesters. The objectives were to investigate (a) whether moral disengagement was a precursor to bullying behavior, vice versa, or whether the relationship was reciprocal and (b) whether gender and grade predicted moral disengagement and bullying behavior. The results showed that moral disengagement predicted bullying perpetration 6 months later. Also, older students and males utilized more moral disengagement than younger students and females and younger students and males engaged in greater bullying perpetration. Indirect paths linking gender and grade to bullying via moral disengagement at previous time points were identified and implications for bullying prevention are discussed. The findings underscore the importance of examining moral disengagement when studying bullying and across gender and development.

Keywords Bullying · Moral disengagement · Gender · Grade · Autoregressive model · Cross-lagged model

Introduction

Bullying is a serious and prevalent problem facing many school-aged youth. The Centers for Disease Control and Prevention in the U.S. defines bullying as "any unwanted aggressive behavior(s) by another youth or group of youths" and involves a "perceived power imbalance and is repeated multiple times or is highly likely to be repeated" (Gladden et al. 2014, p. 7). The prevalence rates of bullying vary, ranging from 6.4 to 38 % for perpetration, and from 28 to 69 % for victimization (Robers et al. 2013; Swearer et al. 2010) with the mean prevalence rates of 35 % for traditional victimization based on a recent meta-analysis (Modecki et al. 2014). This high prevalence rate is alarming, particularly considering the negative consequences that arise from bullying, including later antisocial behavior for perpetrators (e.g., legal convictions due to violence; Farrington and Ttofi 2011), and many psychosocial problems,

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including academic difficulties, depressive and anxious symptoms, low self-esteem, and suicidal ideation (Card and Hodges 2008; Juvonen et al. 2011; Nishina 2012; Swearer et al. 2011). Research has also shown that complex individual and contextual factors (e.g., peer support, bystander behavior, family support, school climate, and exposure to community aggression) contribute to students' involvement in bullying (Barboza et al. 2009). It is essential to understand social cognitive variables, such as moral disengagement and developmental factors that may contribute to bullying perpetration, in order to develop effective interventions to reduce and ultimately, eliminate bullying.

Moral Disengagement and Bullying

The social cognitive theory of moral agency proposes that moral behaviors develop as a product of their continuous and reciprocal interactions with both the social environment and internal stimuli, or cognitions (Bandura 1986, 2002). This theory has been used to explain moral reasoning, moral disengagement, and immoral behavior, such as violence, aggression, and bullying. Moral reasoning is defined as the process of reasoning between right and wrong in difficult situations, and moral behavior is the result of moral reasoning (Kohlberg 1976). However, research has shown that moral reasoning does not always lead to engagement in moral behaviors (e.g., Leenders and Brugman 2005). For example, some individuals who bully others actually have advanced moral competence ("knowledge of right and wrong"), but lack moral compassion ("emotional awareness and conscience concerning moral transgressions") (Gini et al. 2011, p. 603). Bandura and colleagues (1996) argued that moral reasoning is translated into behaviors through "self-regulatory mechanisms through which moral agency is exercised" (p. 364). Immoral behaviors are less likely to be enacted if the individual anticipates feelings of guilt and shame (often referred to as moral emotions and those feelings often drive individuals to behave according to their moral standards). Moral disengagement, defined as a series of cognitive processes used to disengage moral standards to achieve absolved guilt and permit immoral conduct (Bandura 1986), has been used to explain the gap between children's moral reasoning and moral actions. Different moral disengagement mechanisms have been used to justify aggressive and immoral actions, including cognitive justification, minimizing one's agentic role, disregarding or distorting the negative impact of harmful behavior, and blaming or dehumanizing the victim (Bandura 1999).

Moral disengagement has been associated with bullying in a series of cross-sectional studies. For example, researchers found that bullying perpetrators, reinforcers, and assistants of bullies (Gini 2006) as well as bully-victims (Obermann 2011) reported higher levels of moral disengagement to justify their behaviors compared to non-involved students. A recent meta-analysis also found that moral disengagement is a significant predictor for cyberbullying (Kowalski et al. 2014). In addition, moral disengagement is correlated with more pro-bullying behavior and less defender behavior among bystanders (Thornberg and Jungert 2013). Overall, the cross-sectional research suggests that moral disengagement and moral emotions are important underlying factors for bullying.

Despite the connection between moral disengagement and aggressive behavior in cross-sectional studies, less research has examined the relationship between bullying and moral disengagement over time. Some researchers have argued that the directionality between moral disengagement and aggressive behavior is not clear, and may be bidirectional (Bandura 1999; Obermann 2011). Specifically, Bandura (1999) suggested that the change in moral disengagement and moral behavior is a gradual, reciprocal process over time. Initially, individuals may engage in minor forms of aggression, and may make cognitive judgements of their behavior based on moral principles (e.g., feeling guilty). Individuals then justify their behavior through moral disengagement, which allows them to not feel guilty about the aggressive behavior (in other words, bullying predicts later moral disengagement). Over time, individuals continue to disengage from self-sanctions for aggressive behavior, which allows them to engage in additional and more severe aggressive behaviors in the future (in other words, moral disengagement predicts later bullying), perpetuating a cycle between moral disengagement and aggressive behavior. Consistent with the aforementioned bidirectional hypothesis, some researchers have conceptualized moral disengagement as a stable *trait* and examined whether moral disengagement predicts or causes bullying (Gini 2006; Perren et al. 2012). However, other researchers have argued that moral disengagement may be a *state,* which is selectively activated by bullying, and therefore, is predicted by bullying (Obermann 2011). Sticca and Perren (2015) also examined whether the relationship between moral deficiencies and bullying was bidirectional, and their results suggest that moral deficiencies predicted the changes in bullying.

Currently, the results from longitudinal studies are not conclusive. Obermann (2013) found that sixth to eighth graders had relatively stable levels of moral disengagement over two time points (over one year). The initial level of self-reported bullying and changes in self-reported bullying predicted changes in moral disengagement. However, when analyzing data based on four different bullying patterns (stable bullies, non-bullies, new bullies, desisting bullies), no significant change in moral disengagement emerged. Sticca and Perren (2015) analyzed the association between moral deficiencies (moral disengagement, low moral

responsibility, and weak feelings of remorse) and bullying over four semesters from the beginning of seventh grade to the end of eighth grade. The results showed that the initial level of moral deficiencies significantly predicted changes in bullying, but the initial level of bullying did not predict the development of moral deficiencies. Thus, the authors suggested that moral deficiency may be a trait that causes the changes in bullying perpetration. However, Sticca and Perren (2015) used latent growth modeling and were not able to examine the prediction of one construct to another at the later time point (e.g., bullying to moral deficiencies or vice versa). The current study extends the previous research by using longitudinal data over three time points to fit an autoregressive cross-lagged model to examine whether moral disengagement is a precursor to bullying, or vice versa, or whether the two variables show a reciprocal relationship over three semesters.

Gender and Grade Differences

Because the extant research has found gender and grade level differences in bullying behaviors and moral disengagement are inconsistent, it is important to continue examining these differences. The research has found that females view moral dilemmas as more important and more difficult to resolve than males (Skoe et al. 2002), and adolescent males were more likely to report higher levels of moral disengagement than females (Bandura et al. 1996; Obermann 2011). However, gender differences in moral disengagement were not replicated in an African American youth sample (Pelton et al. 2004) or among younger students (e.g., fourth graders, Caravita et al. 2014), suggesting that more research needs to examine gender differences in moral disengagement. In addition, one study using cross-sectional data has found that moral disengagement mediates the relationship between gender and bullying (Turner 2008). However, methodologists have criticized using cross-sectional data to test mediation. To fill this gap, we will use longitudinal data to examine whether there is an indirect effect from gender to bullying via moral disengagement over time.

Researchers have suggested that there is a gap in understanding how moral disengagement changes over time (Caravita et al. 2014). The research on age and grade differences in moral disengagement is sparse and inconsistent. Some researchers suggest that as adolescents learn to regulate their emotions and behaviors, internalize moral principles, and develop moral identity and agency, their moral disengagement tends to decrease (Paciello et al. 2008). Obermann (2013) found that moral disengagement did not significantly change among middle schoolers over a one-year period; however, Caravita et al. (2014) found a decrease in moral disengagement among fourth graders and an increase in moral disengagement among sixth and seventh graders over a 1-year period. Another longitudinal study has shown that moral disengagement generally decreases between ages 14 and 20, especially between ages 14 and 16 (Paciello et al. 2008). Paciello and colleagues (2008) identified a small "later desister group" who showed an increase in moral disengagement from ages 14 to 16, and then a sharp decrease from ages 16 to 20. Cross-sectional studies either did not find age differences in moral disengagement (Bandura et al. 1996; Obermann 2011; Pelton et al. 2004) or found that older students reported higher levels of moral disengagement than younger students (between ages 13 and 15) (Robson and Witenberg 2013). These inconsistent findings may be related to specific age groups being studied (late childhood, early adolescence, vs. late adolescence) and individual differences (e.g., gender, roles in aggression).

The research on gender and grade differences in bullying is also inconsistent and depends on the different types of bullying and grade levels studied, as well as other psychological and school factors. Some studies found that older children were more likely to be bullying perpetrators than younger children (e.g., Cook et al. 2010), or to engage in cyberbullying (but not traditional bullying) (Robson and Witenberg 2013). Other researchers suggested that the bullying tends to increase from elementary school to middle school, peak after school transitions, and then gradually decrease during high school years (Pellegrini and Long 2002; Pepler et al. 2006). Recent longitudinal studies using latent class/transition analysis also identified complex patterns. For example, one study showed that the youngest students at school (sixth graders and ninth) were less likely to bully others and the oldest students at school (eighth graders) were more likely to engage in bullying perpetration (Ryoo et al. 2015). Consistently, one study found that older students (Grades 7 to 10) reported more bullying perpetration at Time 1 than younger students, and bullying increased over a 3-year period. In addition, the increase in bullying was predicted by perceived negative school climate and the increase in depression/anxiety over time (Turner et al. 2014). Another study found that group membership matters. Bullies and bully-victims tended to report increased bullying, but victims and typical students tended to report decreased bullying over the middle school years (Lam et al. 2015). Physical and verbal forms of bullying are more prevalent among males (Card et al. 2008), but gender differences in relational and cyberbullying are less consistent (Card et al. 2008; Robson and Witenberg 2013). In order to better understand the developmental changes in bullying and moral disengagement, and potential gender and grade differences as well as indirect paths linking gender/grade to bullying/moral disengagement, the current study examined whether grade and gender predicted bullying and moral disengagement over time.

Current Study

Although the findings from previous research have supported the correlation between bullying and moral disengagement using cross-sectional data, the longitudinal relationship between the two is not conclusive (Obermann 2013; Sticca and Perren 2015). In addition, research on the effect of gender and grade on bullying and moral disengagement is inconsistent. Since bullying is a prevalent problem, it is important to understand cognitive and other developmental factors that contribute to bullying. Interventions are more likely to be successful when the different trajectories of bullying and cognitive factors contributing to bullying are considered. Due to a lack of longitudinal studies on moral disengagement and bullying, this study seeks to fill a gap in understanding the directionality between bullying and moral disengagement over time by modeling the longitudinal relationships over three consecutive semesters (Fall, Spring, and Fall semesters) among 1180 adolescents. This type of modeling allows for simultaneous examination of longitudinal influences of one construct on another and vice versa. The following research questions guided the current study: 1) Is moral disengagement a precursor to bullying behavior, is bullying a precursor to moral disengagement, or is the relationship reciprocal? 2) Do gender and grade predict moral disengagement and bullying behavior over time? 3) Are there indirect paths linking gender/grade and bullying via moral disengagement?

Based on the results from Sticca and Perren's study (2015) that the initial level of moral deficiencies significantly predicted changes in bullying, we expected that moral disengagement would be a precursor to bullying behavior. Based on the empirical research discussed earlier, we expected that males would report higher levels of moral disengagement and greater involvement in bullying than females. Because one cross-sectional study has found that moral disengagement mediated the relationship between gender and bullying (Turner 2008), we expected that there would be indirect paths linking gender and bullying via moral disengagement over time. Due to the inconsistencies in the literature, we have not formulated specific hypotheses on grade level differences in bullying and moral disengagement, nor whether there are the indirect paths linking grade and bullying via moral disengagement. Our study is one of the first to further understand these longitudinal relationships.

Methods

Participants

The participants were 1180 students from fifth to ninth grades (mean age = 12.2, SD = 1.29) at Time 1 (Fall semester) attending nine schools in a mid-western city in the United States. Due to students' school transitions, the number of schools increased to 22 over three semesters during data collection. Slightly more than half (52.9 %) of participants were female, 46.5 % were male, and gender information was not available for 0.6 % of participants. Grades were distributed from fifth to ninth grades at Time 1: fifth (10.0 %), sixth (31.4 %), seventh (26.4 %), eighth (21.0 %), and ninth grade (10.6 %). Among the participants, 9.9 % indicated that English was not their first language. The ethnicity of the sample was predominantly Caucasian: Caucasian/White (80.2 %), Black/African American (7.1 %), Latino/Hispanic (5.4 %), Asian American (2.4 %), other (1.7 %), and missing (3.2 %). The attrition rates were 5.59 % at Time 2 and 15.34 % at Time 3. Part of the data were published in two previous studies with different research questions and readers can refer to those papers for detailed procedure (Ryoo et al. 2015; Swearer et al. 2012). Specifically, consent forms were sent home to parents and/or guardians of all students in the participating schools and the consent rate was 42.98 %. Almost all students (97 %) gave assent to participate the study. Missing data were addressed by applying the full information maximum likelihood estimation under the assumption that the data were missing at random or missing completely at random.

Measures

The participants completed a demographic questionnaire that included questions about gender, age, grade, first language use, and race/ethnicity, and the Pacific-Rim Bullying measure (PRBm; Konishi et al. 2009), which surveyed students' experiences and concerns about bullying and victimization without using the word "bullying" in order to avoid misunderstanding or different understandings of the bullying construct across countries and languages. Specifically, the students were provided with the following instruction to capture three primary distinguishing characteristics of bullying: intentionality, repetition, and power differential: "Students can be very mean to one another at school. Mean and negative behavior can be especially upsetting and embarrassing when it happens over and over again, either by one person or by many different people in the group. We want to know about times when students use mean behavior and take advantage of other students who cannot defend themselves easily." The students also completed additional counter-balanced measures on internalizing symptoms and cognitive functioning.

Bullying Perpetration

The students were asked to respond to five items from the PRBm (Konishi et al. 2009; Swearer et al. 2012) to

measure bullying perpetration: "In the past two months, how often have you taken part in being mean or negative to others" in different ways including physical, verbal, social exclusion, and cyber bullying (See Table 1). The response options were based on a four-point Likert-type scale, ranging from "Never", "Once or twice", "About once a week", to "Several times a week". To examine reliabilities for the self-reported bullying perpetration scale, we computed coefficient omega (Dunn et al. 2014) that is more robust than coefficient alpha. Coefficient omegas and their 95 % confidence intervals using 1000 bootstrapping were .76 (95 % CI [.74, .78]), .80 (95 % CI [.78, .82]), and .79 (95 % CI [.77, .81] over three time points. In additional to the reliability of the scale, its longitudinal measurement invariance over three semesters was supported (see Supplementary Appendix A), which confirms that scale scores measured by PRBm are on the same metric over time.

Moral Disengagement

Moral disengagement (MD) was measured by the 32-item MD Scale (Bandura et al. 1996) to assess eight mechanisms of moral disengagement: moral justification, euphemistic language, advantageous comparison, displacement of responsibility, diffusion of responsibility, distorting consequences, attribution of blame, and dehumanization. The participants rated each item on a five-point Likert-type scale, ranging from "strongly disagree" to "strongly agree." Previous studies have supported the unidimensional assumption of this measure and found that the 32 items loaded onto one scaled score (e.g., Bandura et al. 1996; Pelton et al. 2004; Turner 2008). Coefficient omegas and their 95 % confidence intervals using 1000 bootstrapping for the scale were .91 (95 % CI [.91, .92]), .94 (95 % CI [.94, .95], and .95 (95 % CI [.95, .96]) over three time points. Consistent with previous research, items were summed to form a total score and higher scores indicated greater use of moral disengagement.

Statistical Analyses

Autoregressive and Cross-Lagged Model

To examine the directionality between bullying behavior and moral disengagement, we compared four models: one autoregressive and cross-lagged model (AR-CL; examining the reciprocal relationship), two directional models between bullying behavior and moral disengagement (MD to bullying, or bullying to MD), and a bi-simplex model with no directional causes (Fig. 1). We used the method proposed by Bollen and Curran (2006) and Little (2013) and applied the criteria of the Satorra-Bentler scaled χ^2 difference test (TRd) statistics whose p-value > 0.05 (Satorra and Bentler 2010; "Mplus Web Note" n.d.) to identify the best fitting model.

Table 1 Parameter estimates in the MD to bullying model

Parameters	Estimate	S.E.	*P-value*
Bullying by…			
pushing, hitting, or kicking or other physical ways	1.050	0.038	<.001
taking things from them or damaging their property	0.855	0.045	<.001
teasing, calling them names, threatening them verbally, or saying mean things to them	1.313	0.055	<.001
excluding or ignoring them, spreading rumors or saying mean things about them	1.072	0.046	<.001
using computer, email or phone text messages	0.710	0.056	<.001
PBullying2 on			
PBullying1	0.428	0.099	<.001
PMD1	0.058	0.058	0.318
PBullying3 on			
PBullying1	0.135	0.075	0.071
PBullying2	0.204	0.074	0.006
PMD1	0.038	0.059	0.524
PMD2	0.181	0.045	<.001
PMD2 on			
PMD1	0.604	0.048	<.001
PMD3 on			
PMD1	0.240	0.066	<.001
PMD2	0.426	0.061	<.001
PMD1 with			
PBullying1	0.332	0.052	<.001
PMD2 with			
PBullying2	0.269	0.050	<.001
PMD3 with			
PBullying3	0.349	0.043	<.001
	Means	S.E.	*P-value*
MD1	63.779	0.528	<.001
MD2	63.992	0.593	<.001
MD3	62.504	0.657	<.001
Bullying1	1.175	0.010	<.001
Bullying2	1.182	0.011	<.001
Bullying3	1.175	0.011	<.001

Note The latent construct of bullying was measured by five items at any time point.

P stands for phantom constructs, and MD stands for moral disengagement

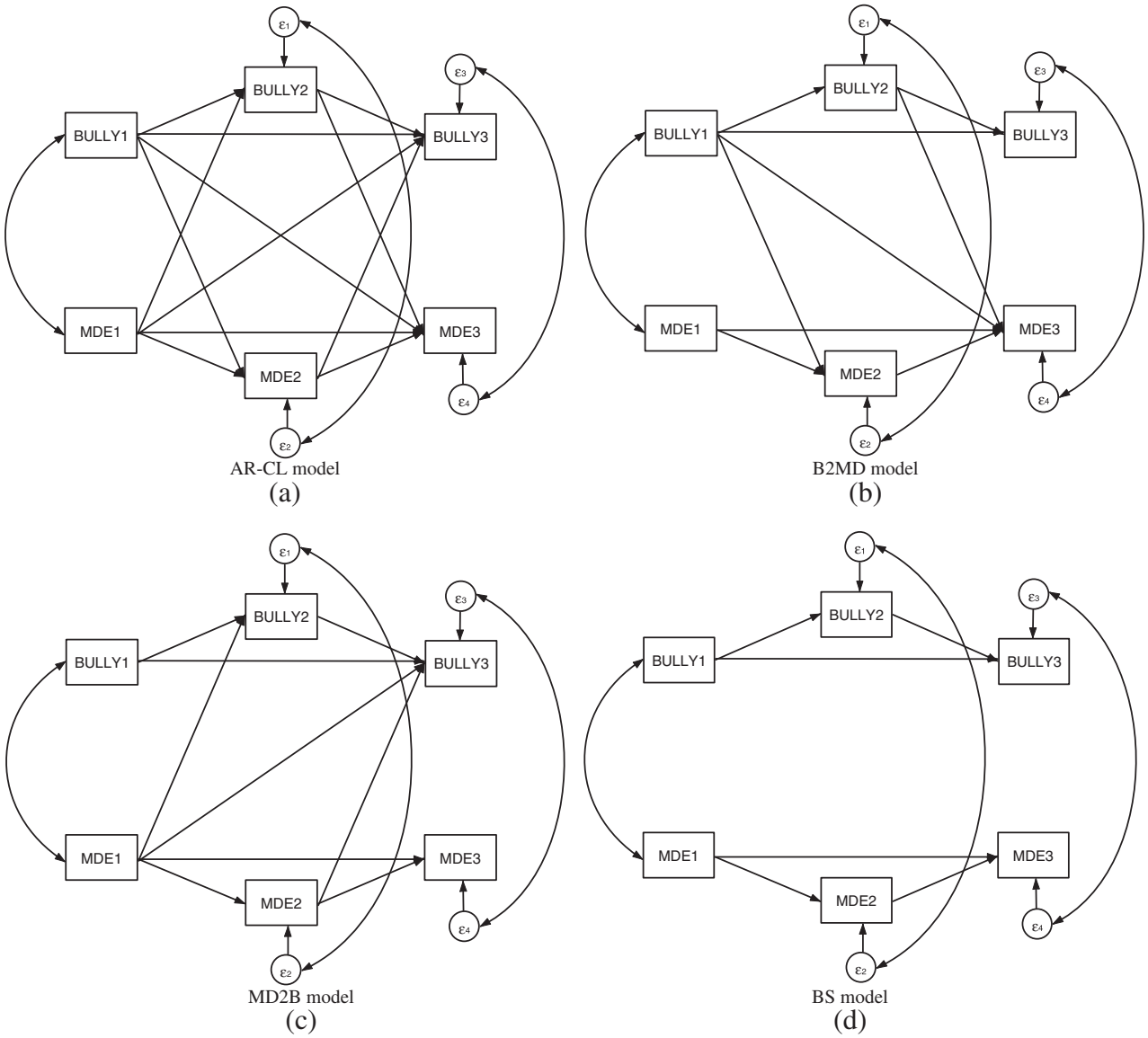

Fig. 1 Four hypothetical models. **a** Auto-regression and cross-legged model (AR-CL), **b** Directional model from bullying to moral disengagement (B2MD), **c** Directional model from moral disengagement to bullying (MD2B), and **d** Bi-simplex model (BS). The autoregressive and cross-lagged model, **a** in Fig. 1, can be written as follows:

$$\begin{cases} b_{i1} = \alpha_{b_1} + \varepsilon_{b_{i1}} \\ md_{i1} = \alpha_{md_1} + \varepsilon_{md_{i1}} \end{cases}, \text{when t} = 1$$

$$\begin{cases} b_{i2} = \alpha_{b_2} + \rho_{b_2 b_1} b_{i1} + \rho_{b_2 md_1} md_{i1} + \varepsilon_{b_{i2}} \\ md_{i2} = \alpha_{md_2} + \rho_{md_2 md_1} md_{i1} + \rho_{md_2 b_1} b_{i1} + \varepsilon_{md_{i2}} \end{cases}, \text{when t} = 2 \quad (1)$$

$$\begin{cases} b_{i3} = \alpha_{b_3} + \rho_{b_3 b_2} b_{i2} + \rho_{b_3 b_1} b_{i1} + \rho_{b_3 md_2} md_{i2} + \rho_{b_3 md_1} md_{i1} + \varepsilon_{b_{i3}} \\ md_{i3} = \alpha_{md_3} + \rho_{md_3 md_2} md_{i2} + \rho_{md_3 md_1} md_{i1} + \rho_{md_3 b_2} b_{i2} + \rho_{md_3 b_1} b_{i1} + \varepsilon_{md_{i3}} \end{cases}, \text{when t} = 3$$

where i is the ith student, ρ_{bb} or ρ_{mdmd} are autoregressive coefficients, ρ_{bmd} or ρ_{mdb} are cross-lagged coefficients, and ε s are error terms

Phantom Constructs

Phantom constructs are not commonly used in an SEM framework but provide estimates of parameters that emerge in a mathematically more useful form; for example, they provide correlations when covariances are expected (Little 2013). In this study, phantom constructs help us to treat both bullying behavior and moral disengagement as latent constructs as well as to obtain correlations that are interpretable (Fig. 2).

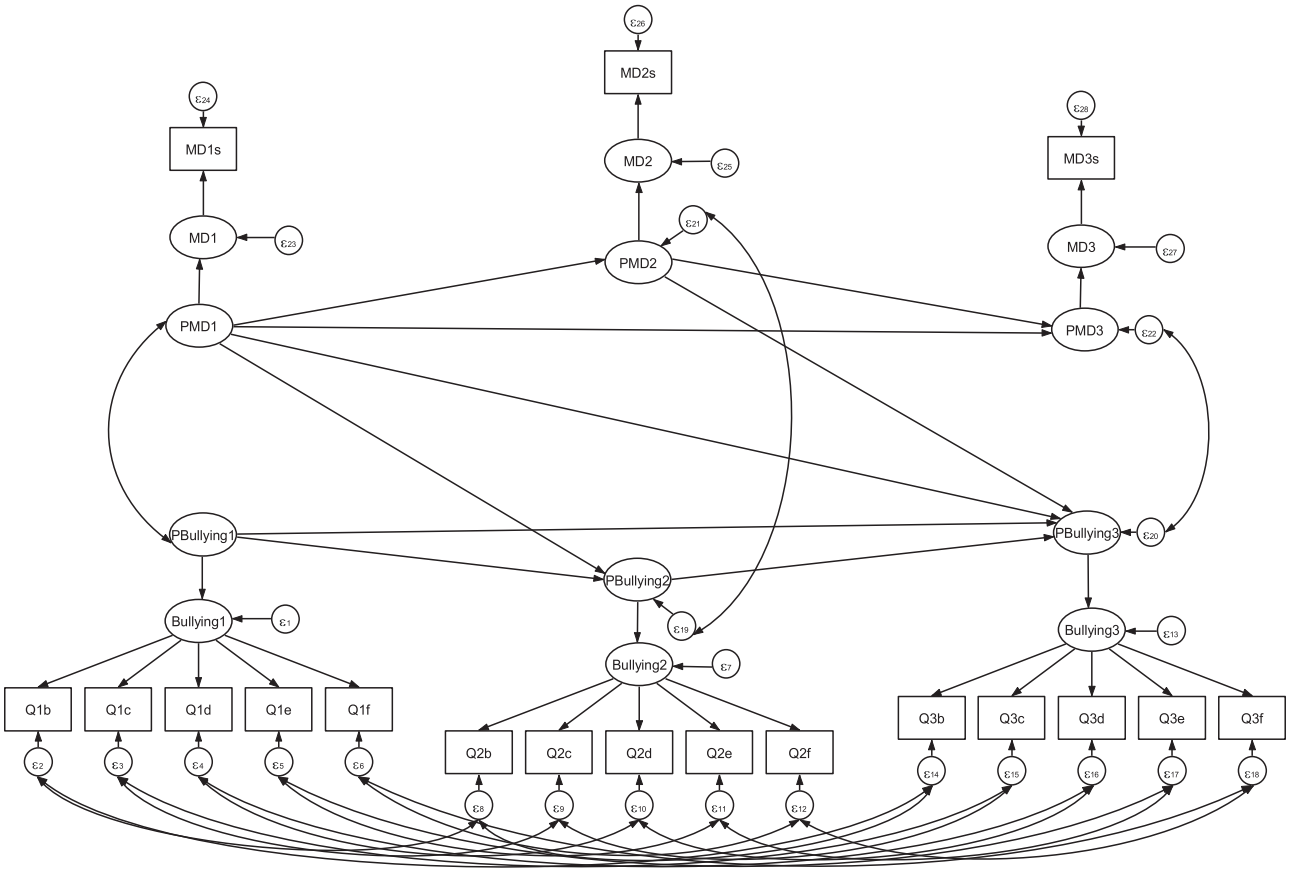

Fig. 2 The MD2B model including phantom constructs

In addition, we fit a multiple-indicators and multiple-causes model (MIMIC model; Jöreskog and Goldberger 1975) in Mplus to examine the effect of gender and grade in the preferred model selected from the four hypothetical models. To confirm whether it is necessary to include the interaction term between gender and grade in the model, we compared two models: (a) a conditional model by adding three covariates, gender, grade, and their interaction, and (b) a conditional model by adding two covariates, gender and grade. The better model selected allowed us to examine how significantly covariates (gender and grade) predict bullying behavior and moral disengagement at each time point and to identify indirect effects from covariates (gender and grade) to bullying via moral disengagement (Fig. 3). In the MIMIC model, we examined not only direct path coefficients but also total and indirect effects among variables. Indirect paths were computed by summing all indirect or detoured path from grade/gender to bullying or moral disengagement. To correct any potential biases, we also used the 95 % bias-corrected bootstrap confidence intervals (Zhao et al. 2010) in addition to the estimates using maximum likelihood estimates with robust standard errors.

Results

Is Moral Disengagement A Precursor to Bullying Behavior?

We compared four hypothetical models (Fig. 1) to identify the best fitting model. According to the nestedness of models, we considered two sets of model comparisons. Supplementary Appendix B indicated that the AR-CL and moral disengagement to bullying (MD2B) models were equally well-fitted and also were significantly better than the Bi-Simplex model. On the other hand, Supplementary Appendix C indicated that the AR-CL is significantly better than both the bullying to MD (B2MD) and Bi-Simplex models. As a result, the MD2B model was the preferred model because MD2B is more parsimonious than AR-CL, indicating the directionality from moral disengagement to later bullying behavior ($\chi^2_{124} = 232.341$, RMSEA = 0.027 (RMSEA 90 % CI = [0.021, 0.032]), SRMR = 0.043 and CFI = 0.959) (Fig. 2).

We further observed these significant relationships: (1) bullying significantly correlates with previous bullying ($\rho_{b_1 \to b_2} = 0.428, p<0.001, d = 0.390$ and $\rho_{b_2 \to b_3} = 0.204$,

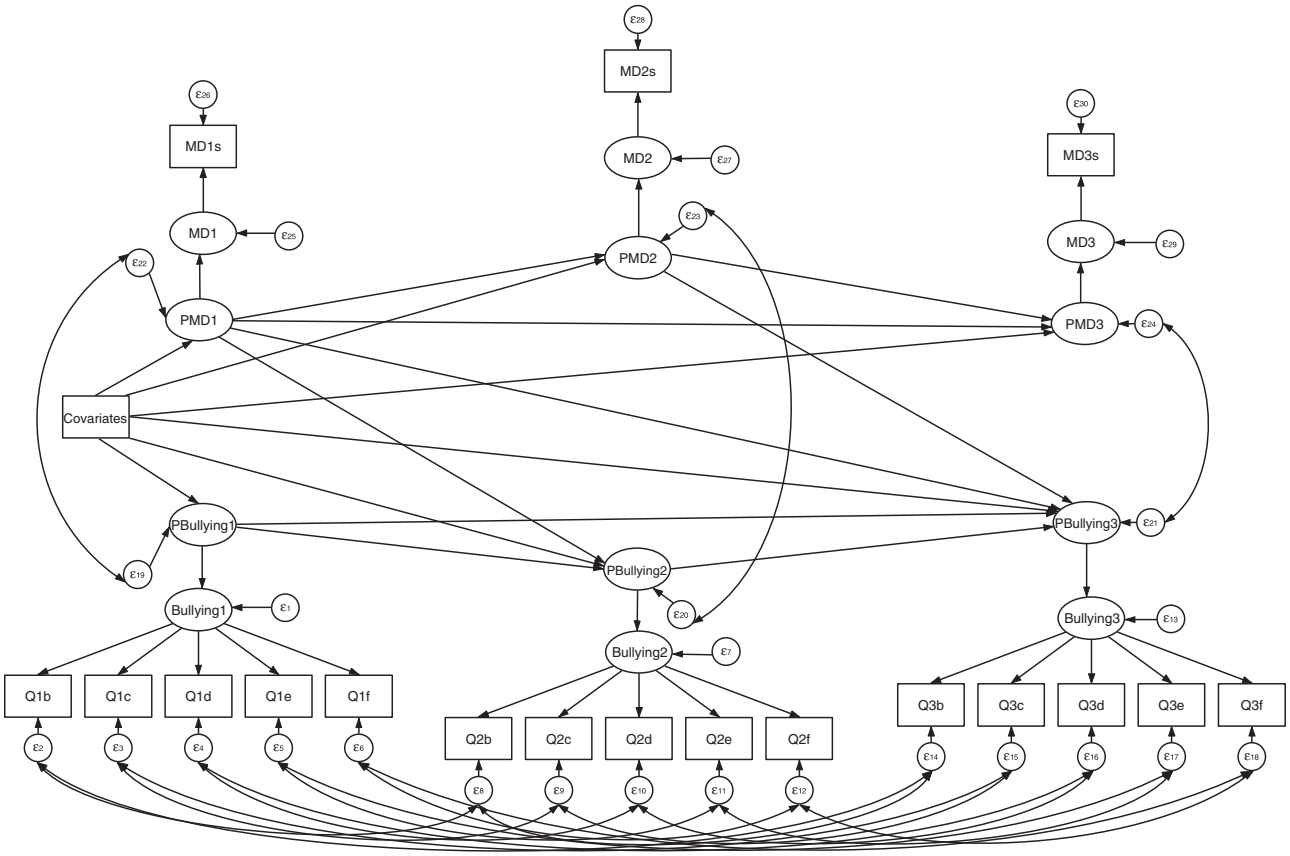

Fig. 3 The MD2B model including phantom constructs of bullying behavior, moral disengagement, and covariates (gender and grade)

$p = 0.006$, $d = 0.205$), except between Time 3 and Time 1 ($\rho_{b_1 \rightarrow b_3} = 0.135$, $p = 0.071$, $d = 0.124$); (2) moral disengagement significantly correlates with prior moral disengagement ($\rho_{md_1 \rightarrow md_2}, = 0.604$, $p < 0.001$, $d = 0.517$, $\rho_{md_1 \rightarrow md_3} = 0.240$, $p < 0.001$, $d = 0.201$, and $\rho_{md_2 \rightarrow md_3} = 0.426$, $p < 0.001$, $d = 0.416$); (3) all correlations between moral disengagement and bullying behaviors are significant at the same time point ($corr(md_1,b_1) = 0.332$, $p < 0.001$, $corr(md_2,b_2) = 0.269$, $p < 0.001$ and $corr(md_3,b_3) = 0.349$, $p < 0.001$); and (4) moral disengagement at Time 2 significantly predicts bullying behaviors at Time 3 ($\rho_{md_2 \rightarrow b_3} = 0.181, p<0.001, d = 0.194$). We observed that the effect sizes computed from standardized parameter estimates (Brown 2015) ranged from small to medium (Table 1).

How do Gender and Grade Predict Moral Disengagement and Bullying Behavior?

To examine the effects of gender and grade on bullying behavior and moral disengagement, we compared three models: MD2B, MD2B with gender and grade, MD2B with gender, grade, and their interaction. The MD2B with gender and grade model was significant better than the MD2B model ($TRd = 232.274$, $p < 0.001$ and $\Delta CFI = 0.015$). In addition, the MD2B model with gender and grade was equally well fitted compared with the MD2B with gender, grade, and their interaction model ($TRd = 9.658$, $p < 0.140$ and $\Delta CFI = 0$). The MD2B with gender and grade model was selected and interpreted as the best fitting model due to its parsimony. Fit statistics of the MD2B with gender and grade model were in good bounds ($\chi^2_{163} = 334.151$, RMSEA = 0.030, 90 % CI = [0.025, 0.035], SRMR = 0.043, and CFI = 0.944). The relationship between bullying behavior and moral disengagement in the MD2B with gender and grade model did not change from the MD2B model (See Table 2).

We found seven significant total effects linking gender and grade to moral disengagement or bullying. The first three significant total effects are the paths of gender to moral disengagement at different time points ($\rho_{gender \rightarrow md_1} = 0.277$, $p < 0.001$, $d = 0.137$, $\rho_{gender \rightarrow md_2} = 0.310$, $p<0.001$, $d = 0.131$, and $\rho_{gender \rightarrow md_3} = 0.301$, $p<0.001$, $d = 0.126$). The next two are the paths of grade to moral disengagement at Times 2 and 3 ($\rho_{grade \rightarrow md_2} = 0.129$, $p < 0.001$, $d = 0.126$ and $\rho_{grade \rightarrow md_3} = 0.099$, $p = 0.003, d = 0.096$). The last two are the paths of gender and grade to bullying

Table 2 Effects of gender and grade on both bullying behaviors and moral disengagement on the MD2B model

		Bullying			Moral Disengagement		
		Estimate	S.E.	*p*-value	Estimate	S.E.	*p*-value
Gender	*Time1*						
	Direct	0.098	0.068	0.148	0.277	0.060	0.000** ($d = 0.137$)
	Total indirect	N/A	N/A	N/A	N/A	N/A	N/A
	Total	0.098	0.068	0.148	0.277	0.060	0.000** ($d = 0.137$)
	Time2						
	Direct	0.068	0.071	0.344	0.147	0.063	0.021* ($d = 0.062$)
	Total indirect	0.057	0.035	0.105	0.163	0.036	0.000** ($d = 0.069$)
	Total	0.125	0.075	0.097	0.310	0.073	0.000** ($d = 0.131$)
	Time3						
	Direct	0.122	0.074	0.098	0.109	0.066	0.101
	Total indirect	0.105	0.029	0.000** ($d = 0.047$)	0.192	0.041	0.000** ($d = 0.080$)
	Total	0.227	0.079	0.004** ($d = 0.103$)	0.301	0.076	0.000** ($d = 0.126$)
Grade	*Time1*						
	Direct	0.004	0.028	0.885	0.033	0.026	0.204
	Total indirect	N/A	N/A	N/A	N/A	N/A	N/A
	Total	0.004	0.028	0.885	0.033	0.026	0.204
	Time2						
	Direct	−0.014	0.031	0.654	0.109	0.026	0.000** ($d = 0.107$)
	Total indirect	0.004	0.013	0.779	0.020	0.016	0.208
	Total	−0.010	0.033	0.760	0.129	0.031	0.000** ($d = 0.126$)
	Time3						
	Direct	−0.108	0.031	0.000** ($d = 0.114$)	0.038	0.031	0.213
	Total indirect	0.023	0.013	0.080	0.061	0.018	0.001** ($d = 0.059$)
	Total	−0.085	0.032	0.008** ($d = 0.090$)	0.099	0.034	0.003** ($d = 0.096$)

Note The indirect effect was computed by summing all indirect or detoured path from gender or grade to bullying or moral disengagement

*$p < 0.05$; **$p < 0.01$

behavior at Time 3 ($\rho_{gender \to b_3} = 0.227$, $p = 0.004$, $d = 0.103$ and $\rho_{grade \to b_3} = -0.085$, $p = 0.008$, $d = 0.090$). Specifically, males reported higher levels of moral disengagement at all three times than females. In addition, males also engaged in more bullying at Time 3. Older students reported higher levels of moral disengagement Times 2 and 3 than younger students. However, overall, older students engaged in less bullying at Time 3 than younger students.

Indirect Paths Linking Gender to Bullying via moral disengagement

Consistent with the hypothesis, we found two indirect paths linking gender to bullying behavior at Time 3 via moral disengagement at Times 1 and 2 ($\rho_{gender \to md_2 \to b_3} = 0.027$ 95%CI$[0.003, 0.059]$, $p = 0.044$, $d = 0.012$ and $\rho_{gender \to md_1 \to md_2 \to b_3} = 0.030$ 95% CI [0.013, 0.052], $p = 0.002$, $d = 0.013$), suggesting that males reporting higher levels of moral disengagement at Times 1 and 2 engaged in more bullying behavior at Time 3.

Indirect Paths Linking Grade and Bullying via moral disengagement

We found the indirect path linking grade to bullying behavior at Time 3 via moral disengagement at Time 2 ($\rho_{grade \to md_2 \to b_3} = 0.02095\%$ CI$[0.008, 0.035]$, p = 0.003, d = 0.021), suggesting that older students reporting higher levels of moral disengagement at Time 2 engaged in more bullying behavior at Time 3. However, this indirect effect showed the opposite signs as in the total effect, which warrants some attention. Specifically, although the total effect of grade to bullying at Time 3 is negative, suggesting older students engaged in less bullying, older students who reported higher levels of moral disengagement at Time 2 actually engaged in more bullying behavior at Time 3 (significantly positive indirect effect). The opposite direct and indirect effects linking grade to bullying highlight the complex nature of developmental changes in bullying, and the existence of different pathways from grade to bullying.

Discussion

Cross sectional studies have provided ample support for the correlation between moral disengagement and bullying. Some researchers have suggested that the relationship between bullying and moral disengagement may be reciprocal (Bandura 1999). However, due to a lack of longitudinal studies on moral disengagement and bullying, as well as the inconsistent findings from the few existing longitudinal studies, the directionality between bullying and moral disengagement is not clear. For example, distinct patterns have emerged from two longitudinal studies with one showing that the initial level of bullying predicting changes in moral disengagement (Obermann 2013), and the other suggesting that moral deficiencies predicting changes in bullying (Sticca and Perren 2015). In addition, research on gender and grade differences in bullying and moral disengagement is also not conclusive. It is important to examine the relationship between bullying and moral disengagement as well as the effect of gender and grade in order to design effective developmentally sensitive bullying prevention programs.

This is the first known study that has examined the relationship between bullying perpetration and moral disengagement over three time points, including the effects of gender and grade on both constructs. We identified the continuity of bullying perpetration and moral disengagement over three time points; meaning both variables were correlated with its counterparts at the previous time points. Consistent with our first hypothesis, after controlling for prior levels of moral disengagement and bullying behavior, moral disengagement at Time 2 significantly predicted bullying perpetration at Time 3. Our results highlight the important role of moral disengagement underlying bullying perpetration using longitudinal data. Bullying perpetrators justify aggressive and immoral actions by using cognitive mechanisms, such as disregarding/distorting the negative impact of harmful behavior, and blaming or dehumanizing the victim, experience less guilt associated with perpetration, which then enables them to engage in future aggressive and immoral behaviors. This finding is consistent with the theory of moral disengagement (Bandura 1999) and previous findings (Gini 2006; Sticca and Perren 2015). Our findings support the importance of developing and utilizing cognitive interventions that target perpetrators' moral disengagement in order to prevent bullying perpetration.

The Effect of Gender and Grade

Consistent with our hypothesis and previous research, we found that males utilized the mechanisms of moral disengagement more than females (Bandura et al. 1996; Obermann 2011). The finding is consistent with previous theory that females tend to have a relationship orientation to moral reasoning compared to males (Gilligan 1982). As a result, moral disengagement is less common among females. Our findings continue to provide support for the important gender differences in moral disengagement.

Consistent with our hypothesis and some previous research (e.g., Card et al. 2008), males in our study engaged in more bullying perpetration than females at Time 3. To our knowledge, this is the first longitudinal study identifying two significant indirect paths linking gender to bullying behavior via moral disengagement at two previous time points. This suggests that the gender differences in bullying can partially be attributed to gender differences in moral disengagement at previous time points. This finding is consistent with our hypothesis and one previous study showing that moral disengagement mediated the relationship between gender and bullying using cross-sectional data (Turner 2008). Our finding is an important step toward identifying the social cognitive factors, such as moral disengagement, which may underlie gender differences in bullying (Espelage et al. 2004).

Our results suggest that older students engaged in less bullying behavior at Time 3, which is consistent with the previous research (Pellegrini and Long 2002; Pepler et al. 2006). However, two recent longitudinal studies have challenged this finding and found that bullying increased for some subgroups of high school students (e.g., bully and bully-victims) (Lam et al. 2015; Turner et al. 2014). We found an indirect path linking higher grade levels to greater moral disengagement at Time 2 and then more bullying at Time 3. To our knowledge, this is the first study identifying the opposite direct and indirect effects linking grade to bullying. This finding highlights the complex nature of developmental changes in bullying. As adolescents age, most of them might internalize social norms against bullying, and hence, might decrease their bullying perpetration; however, for a subgroup of students, as they get older, they actually engage in more bullying via the increase in moral disengagement over time. This important finding helps to explain the inconsistency in the literature regarding grade/age and bullying (Cook et al. 2010; Lam et al. 2015; Pellegrini and Long 2002; Turner et al. 2014), and highlights the importance of examining moral disengagement when studying the developmental differences in bullying.

Our finding that older students were more likely to utilize moral disengagement than younger students was consistent with some previous research (Robson and Witenberg 2013), but not others (Paciello et al. 2008; Pelton et al. 2004). Our study includes students from fifth to ninth grade at Time 1 (mean age = 12.2 years), which is a relatively older group and a group with a wider age range compared with some other studies (e.g., Pelton et al. 2004), and a younger group than Paciello and colleague's (2008)

sample. The inconsistency in the literature regarding age differences in moral disengagement is likely influenced by the specific age group being studied.

Limitations and Future Studies

Understanding the complex cognitive and developmental mechanisms that influence involvement in bullying is critical for informing prevention and intervention efforts, which have had limited success in significantly reducing bullying behaviors among school-aged children (Hymel and Swearer 2015). Although this study has made significant contributions to the literature by using advanced statistic methods to examine relationships between bullying and moral disengagement over three time points and to examine the impact of gender and grade, it is not without limitations. First, participants were recruited from a single school district in a mid-sized Midwestern city and the majority of the participants were Caucasian. Different school contexts and school climate may differentially impact bullying involvement and there may be cultural differences that underlie different mechanisms of moral disengagement (Frey et al. 2015). Future studies should recruit more minority students and collect data from urban and rural schools. Furthermore, we only collected student self-report data. It is possible that bully perpetrators may underreport their bullying involvement due to social desirability or they may over-report their bullying in an effort to promote their reputation of being "tough" (Houghton et al. 2012). Future research should consider using peer and teacher nominations. We used the sum of the moral disengagement scale as an indicator for moral disengagement since previous studies have supported the unidimensional assumption of this measure (e.g., Bandura et al. 1996; Pelton et al. 2004; Turner 2008). As such, we were not able to study the specific mechanisms of moral disengagement nor detect any potential measurement invariance over time. Future studies should also consider assessing moral disengagement using other measures with high validity (e.g., Thornberg and Jungert 2014). Our findings based on indirect paths are not equivalent to full longitudinal mediation effects discussed in Cole and Maxwell (2003) and Little (2013) because we were not able to test the factor structure of moral disengagement and its measurement invariance in this study. Rather, we identified the significant indirect paths from the best fitting model (MD2B with gender and grade) based on our research question 2. Therefore, further longitudinal studies are needed to identify the full longitudinal mediation effects. Furthermore, because the effect of grade on bullying and moral disengagement may differ based on group memberships (age, bully/victim status), future studies may want to collect longitudinal data for a longer period of time (e.g., over three years, during school transitions) and to conduct subgroup analyses to track changes in bullying and moral disengagement. We were not able to examine whether gender and grade moderate the relationship between bullying and moral disengagement due to relatively large number of parameters in a multi-group analysis. Future studies using a larger sample size should examine this moderation effect. Future studies should also examine other cognitive and moral factors (e.g., moral identity and moral emotions) related to bullying behaviors.

Implication for Bullying Prevention

Since moral disengagement is a risk factor for later bullying perpetration, it is important to restructure the moral cognitions of the bully perpetrators in order to change their behavior. For example, cognitive restructuring, a cognitive-behavioral technique where the clinician challenges clients' thinking about the impact of their cognitive distortions on their behavior, can be utilized when working with bullying perpetrators. Cognitive restructuring can help prevent perpetrators' use of moral disengagement, such as disregarding or distorting the negative impact of bullying. Specifically, for bully-victims, discussing their own experience as a victim might make it harder for them to disregard or distort the negative impact of their behavior (Hymel et al. 2005). Adults can facilitate discussions about how the bully perpetrators are responsible for victims' suffering to prevent perpetrators from blaming or dehumanizing their victims to justify their behavior. Adults can encourage adolescents to discuss moral dilemmas to promote critical thinking and personal responsibility in order to mitigate the effects of moral justification. Educators also need to encourage moral engagement among all students, especially among bystanders (Gini et al. 2011) by enhancing empathy, addressing responsibility diffusion, encouraging taking responsibility, and developing positive school norms to help transform reinforcers and assistants of bullying to defenders who take a stand against bullying.

Although prevention and intervention programs for school bullying have proliferated in the past few decades, the literature on morality-based interventions is scant. Barkoukis and colleagues (2015) studied a school-based awareness intervention to combat cyberbullying among adolescents through awareness-raising activities in high schools, highlighting the negative consequence of cyberbullying. The results showed a significant decrease in total moral disengagement and in the distortion of consequences and attribution of blame after the intervention. Other intervention programs have also been found to be effective in changing social norms (e.g., Perkins et al. 2011) and reducing hostile-attribution biases and devaluing aggression (e.g., *Fast Track* program, Dodge and Godwin 2013) to reduce bullying/antisocial behavior, and increase bystander

responsibility (e.g., *Steps to Respect* program, Frey et al. 2005).

An alternative to whole school approaches is an individualized cognitive intervention using cognitive restructuring and empathy-based approaches for students with a history of bullying behavior. Considering the role of moral disengagement in bullying, cognitive-behavioral interventions should systematically measure and specifically target relevant moral-cognitive processes (i.e., blaming or dehumanizing the victim) that underlie bullying. A therapist trained in cognitive-behavioral approaches can deliver this intervention in the school setting (Doll and Swearer 2006).

In implementing bullying prevention and intervention strategies, it is important for teachers and parents to focus on males as well as older students who show higher levels of moral disengagement. Considering that bully prevention programs differ in their efficacy across grades (less effective among high school students; Yeager et al. 2015), it is important to ensure that interventions for moral engagement are developmentally appropriate so that older students and males do not perceive them as irrelevant. For example, for middle school students who care deeply about peer acceptance and loyalty to friends, talking about peer influences on bullying will be a good moral dilemma to discuss. Considering that adolescent males are not typically socialized to talk about feelings and instead are socialized to maintain their toughness (masculinity), tailoring interventions to meet their needs is critical (Pollack 1998). Only when bullying interventions take moral cognitive processes (e.g., moral disengagement) into consideration, and are gender and developmentally appropriate, will interventions be effective in stopping bullying.

Conclusion

The results from the current study represent an important and meaningful contribution to the literature on moral disengagement and bullying. This study adds to a limited body of longitudinal research on bullying and moral disengagement (Obermann 2013; Sticca and Perren 2015), and clarifies the inconsistent findings between bullying, moral disengagement, gender, and grade differences (Bandura et al. 1996; Caravita et al. 2014; Cook et al. 2010; Lam et al. 2015; Obermann 2013; Turner et al. 2014). Importantly, this study used advanced statistical methods to examine relationships between bullying and moral disengagement over three time points and to examine the impact of gender and grade. We found that moral disengagement predicted later bullying among adolescents. In addition, we found that older students and males utilized more moral disengagement than younger students and females while younger students and males engaged in greater bullying perpetration. Furthermore, to our knowledge, this is the first study that identified the indirect path linking gender to moral disengagement and then bullying 6 months later, which is an important step toward identifying the social cognitive factors that may underlie gender differences in bullying. Finally, to our knowledge, this is the first study to identify the opposite direct and indirect effects linking grade to bullying via moral disengagement. This finding highlights the complex nature of developmental changes in bullying and helps to explain the inconsistent findings in the literature on grade and bullying. These findings highlight the importance of examining moral disengagement when studying bullying and across gender and development. Bullying is a complex social relationship that cannot be fully understood during one time period nor as a gender-specific experience.

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Compliance with ethical standards All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Conflict of interest The authors declare that they have no competing interests.

Ethical Approval The research has been approved by the IRB from the University of Nebraska-Lincoln.

Informed Consent Informed consent was obtained from all parents/guardians of the participants and assent was obtained from all participants included in the study.

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