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The Effect of Bullying and Victimization on Cognitive Empathy Development During the Transition to Middle School

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Abstract

Background   Interventions aimed at reducing bullying behavior commonly target the development of empathy. Yet, few longitudinal studies have investigated how empathy levels vary with bullying and victimization over time, especially during the transition to middle school.

Objective   To that end, the purpose of the present study was to: (1) examine the naturally-occurring changes in cognitive empathy during the transition from elementary to middle school, and (2) explore the effect of bullying and victimization involvement on changes in cognitive empathy over time, and specifically during this school transition.

Methods   Latent growth curve modeling was used to examine growth trajectories in empathy over time and the effects of bullying involvement on this growth among a sample of 431 students (52 % female, 52 % Latino, 10.18 years old at baseline), using data collected during the spring semester of the 4th grade, the fall and spring semesters of 5th grade, and the spring semester of 6th grade.

Results   Cognitive empathy decreased over time, and a linear trajectory was the best fitting shape for these data. Bullying and victimization were both associated with lower levels of cognitive empathy throughout the study. However, the effect of victimization was small and it became non-significant when both were added to the model. Several notable participant-related differences were found.

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Conclusions These findings point to the potential to improve cognitive empathy skills and reduce involvement in bullying via preventive interventions prior to the transition from elementary to middle school to assist youth in making a more successful transition.

Introduction

Bullying is defined as chronic and repetitive behavior intended to harm or discomfort another person (Olweus 1993). Inherent to bullying behavior is an imbalance of power, either physical or psychological, with more powerful individuals asserting their dominance over less powerful peers (Espelage and Swearer 2003; Jenson and Dieterich 2007; Nansel et al. 2001; Olweus 1993). Bullying occurs in different forms. In some cases, bullying is overt or direct (e.g., hitting, pushing, name-calling, threats, and malicious teasing), while at other times it is relational or indirect in nature (e.g., social exclusion, spreading rumors, demanding compliance as a condition of friendship). Findings from prevalence studies of bullying and victimization indicate that more than 20 % of elementary school students are victims of bullying and that up to 15 % of students participate in bullying behavior (Benedict et al. 2014; Nansel et al. 2001).

Bullying often leads to negative consequences for both bullies and victims (Barker et al. 2008; Jenson and Dieterich 2007; Olweus 1993). Victims of bullying are at elevated risk for experiencing mental health problems like depression, anxiety, and low self-esteem and poor school performance (Kaltiala-Heino et al. 2000; Smokowski and Kopasz 2005; Sourander et al. 2007). Although youth who bully others sometimes gain power and status among peers (Hawley 2003; Vaillancourt et al. 2003), substance use, academic failure, mental health symptoms, and aggressive or violent behavior have also been reported among bullies during adolescence and young adulthood (Klomek et al. 2007; Smokowski and Kopasz 2005). Finally, youth who both participate in bullying and are victimized by others have higher levels of adverse social, emotional, and behavioral outcomes than other students (Barker et al. 2008; Bauman 2008; Forero et al. 1999; Kumpulainen et al. 1998). The severity of the impact of bullying on positive child and adolescent development has elevated bullying as a public health concern in the United States (Kann et al. 2014) and worldwide (Srabstein and Leventhal 2010).

Cognitive Empathy, Bullying, and Victimization

Empathy, defined as the ability to understand and share in another person's emotional state (Jolliffe and Farrington 2004), is as an important component in understanding and preventing bullying and victimization (Jolliffe and Farrington 2004; van Noorden et al. 2014). Findings from prior studies of empathy and bullying have revealed complex relationships between bullying, victimization, and empathy (van Noorden et al. 2014). High levels of empathy are consistently associated with prosocial and altruistic attitudes and behaviors (Espelage et al. 2004; Jolliffe and Farrington 2004, 2006; Kaukiainen et al. 1999; Sutton et al. 1999). However, research findings are mixed when examining the relationship between empathy and bullying (Jolliffe and Farrington 2004; van Noorden et al., 2014). In their

review, van Noorden et al. (2014) found that, while some studies reported a negative relationship between empathy and bullying as one might expect, other studies either found no relationship and some even reported a positive one. This inconsistency may be due in part to differences in the types of empathy examined. Although two distinct types of empathy—cognitive and affective—have been identified in the literature, they often have not been examined separately in relation to bullying (van Noorden et al. 2014). *Cognitive empathy* is defined as the ability to understand another person's emotional state, while *affective empathy* is the vicarious arousal, or ability to feel, the emotional state of another (Jolliffe and Farrington 2004). Cognitive empathy, the focus of the current study, is characterized by a young person's capacity to understand and interpret others' experiences in a manner that allows for skilled negotiation with peers in social interactions (Galinsky et al. 2005).

Advancing the study of the relationship between empathy and bullying necessitates examining cognitive and affective forms of empathy separately. However, findings from a recent systematic review by van Noorden et al. (2014) that addressed this concern still revealed mixed results with regard to the relationship between cognitive empathy and bullying. For example, some investigators have found bullies to have *high* levels of cognitive empathy and have hypothesized that this form of empathy actually helps bullies to understand and psychologically manipulate other students (Jolliffe and Farrington 2006; Sutton et al. 1999). This perspective suggests that cognitive empathy may equip a young person with the skills to be an "effective" bully (Jolliffe and Farrington 2006; Sutton et al. 1999). However, other investigators report that cognitive empathy decreases as levels of bullying behavior increase (van Noorden et al. 2014). Still other investigators have found no significant relationships between cognitive empathy and bullying behavior. Perhaps surprising, findings from the van Noorden et al. (2014) review indicate that victimization is inversely related to levels of cognitive empathy.

The Present Study

One potential explanation behind the mixed results concerning relationships between cognitive empathy, bullying, and victimization is that these relationships are not static. In other words, they may change over time and with maturation. Unfortunately, few longitudinal studies have been conducted that examine whether empathy varies as a function of bullying and victimization involvement over time. Recent evidence suggests that rates of bullying and victimization do change over the course of child and adolescent development, particularly during the transition from elementary to middle school (Jenson et al. 2010; Nylund et al. 2007). The transition to middle school may constitute a period of increased bullying as youth adjust to different school environments and struggle to establish relationships and status among new peer networks (Pellegrini and Long 2002; Salmivalli 2002). Few studies have extended this work to understand changes in empathy over time. While some studies have examined changes in empathy over the course of early childhood (e.g., Zahn-Waxler et al. 1992), adolescence (e.g., Van der Graaff et al. 2014), and adulthood (e.g., O'Brien et al. 2013), no study to our knowledge has explicitly modeled the naturally-occurring developmental changes in cognitive empathy during the transition to middle school. Evidence suggests that cognitive empathy increases during adolescence, which might help explain why bullying decreases during middle and late adolescence (Van der Graaff et al. 2014). However, developmental changes in empathy that correspond to the transition to middle school have yet to be examined. Understanding the developmental

trajectories of empathy during this critical time period is likely to help explain the increases in bullying that tend to occur as youth negotiate their social positions in middle school. Since the nature of the relationship between empathy and bullying and victimization is unclear, and the developmental changes in empathy during the transition to middle school have not yet been determined, exploratory analyses were conducted to: (1) examine the naturally-occurring changes in cognitive empathy during the transition from elementary to middle school, and (2) explore the effect of bullying and victimization involvement on changes in cognitive empathy over time, and specifically during this school transition. As described above, little is known about the ways in which cognitive empathy changes as a result of the transition to middle school or in response to involvement in bullying and victimization. Further longitudinal investigation into the relationship between cognitive empathy and bullying and victimization involvement is likely to offer important insights for developmentally relevant intervention programs aimed at reducing bullying involvement and training youth to prevent and intervene in bullying situations.

Method

Procedures

Data come from a group-randomized trial assessing the effects of a skills-based curriculum, *Youth Matters* (YM), on aggression and victimization among fourth and fifth grade students enrolled in 28 urban elementary schools (Jenson and Dieterich 2007). Fourteen experimental and 14 control group schools participated in the YM investigation. Five waves of data were collected over three academic years—once during the fall and spring semesters of fourth and fifth grade, and once during the spring semester of sixth grade as part of a 12-month follow-up. Results from the randomized trial revealed a significant decrease in peer victimization for experimental participants compared to controls; detailed accounts of the study's main findings are reported elsewhere (Jenson and Dieterich 2007; Jenson et al. 2010, 2013; Williford et al. 2011, 2014).

The current study analyzed data from control group participants collected during the spring semester of fourth grade, the fall and spring semesters of fifth grade, and the spring semester of sixth grade.[1] Participants from the experimental group were excluded as the research question centered on naturally-occurring development in cognitive empathy, which was expected to be influenced by participation in the YM program. Students assigned to the control group were never administered the YM program.

Sample

After obtaining human subjects approval from the sponsoring university and school district, students were recruited to participate in the study. Parental consent and youth assent were obtained prior to participation in the study. A total of 674 students were eligible in the control condition for participation in the study; 68 % of parents consented to their child's participation, 16 % declined, and 16 % did not return the consent form, resulting in a control group sample of 458 consented participants at baseline. Two subjects declined to participate during the second year of data collection and twenty-five subjects were

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[1] The measure of cognitive empathy was not collected at the first measurement wave during the spring of fourth grade.

excluded due to missing data (described below); thus, the analysis sample contained data from 431 students. The analysis sample was gender-balanced—52 % ($n = 224$) of participants were female—and predominantly Latino/a, which corresponds to the ethnic composition of the population in the school district; 52 % ($n = 223$) were Latino/a, 18 % ($n = 79$) were African-American, 11 % ($n = 47$) were Non-Latino White, 3 % ($n = 14$) were American-Indian, 3 % ($n = 14$) were Asian, and 13 % ($n = 54$) were an ethnicity not otherwise specified. The average ages at each measurement occasion were as follows: spring fourth grade ($M = 10.18$, SD $= 0.45$), fall fifth grade ($M = 10.79$, SD $= .46$), spring fifth grade ($M = 11.22$, SD $= .45$), and spring sixth grade ($M = 12.26$, SD $= .47$).

Measures

Data were collected through self-report measure administration at each time point. Survey items were read aloud to participants by trained interviewers. In addition to demographic characteristics, levels of cognitive empathy, bullying, and victimization were collected using standardized measures detailed below.

Cognitive Empathy

Cognitive empathy was measured using a five-item version of the perspective-taking dimension of the *Interpersonal Reactivity Index* (Davis [1980], [1983]) which included the following items: (a) "Before I 'dis' someone, I try to imagine how I would feel if someone did that to me"; (b) "I believe there are two sides to every questions and try to look at them both."; (c) "When I'm mad at someone, I try to imagine how they feel for a while."; (d) "When my friends are having a disagreement or an argument, I try to listen to everybody before I decide who is right."; (e) "I try to understand my friends better by imagining what things are like for them." The items were coded as follows: $1 = Big\ No$, $2 = No$, $3 = Yes$, $4 = Big\ Yes$. An empathy scale score was calculated by averaging across. The ordinal alpha coefficient[2] (Gadermann et al. [2012]) for the empathy scale across the four time points was .86, .84, .85, and .83, respectively.

Bullying/Victimization

Frequency of bullying was measured using the *Revised Olweus Bully/Victim Questionnaire* (Olweus [1996]); specifically, six items were used to measure how often students had participated in specific bullying behaviors. Two of these items assessed relational bullying and asked students whether they had excluded peers from activities or spread false rumors about others. Four items assessed overt bullying acts and asked students to report whether they had called other people names, hit or kicked other students, took property from others, or threatened or forced other students to do things against their will. Students' self-reports for each of the six bullying items included acts that occurred since the beginning of the school year. Participants were asked to respond using a 5 item response scale: $1 = It\ hasn't$ *happened since the beginning of the school year*, $2 = Only\ once\ or\ twice$, $3 = 2\ or\ 3\ times$ *a month*, $4 = about\ once\ a\ week$, $5 = Several\ times\ a\ week$. Bullying scores were created by averaging the six response items. The ordinal alpha coefficient for this scale across the

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[2] The ordinal alpha coefficient is a version of the Cronbach's alpha reliability index that is based on a polychoric correlation matrix as opposed to the standard Pearson correlation matrix, which is more appropriate for ordinal items.

four time points was .95, .89, .87, and .89, respectively. Victimization was measured with a similar set of six items, but adapted to assess whether the student was a victim of each behavior. The response scale was identical to that used in the bullying subscale. A scale score was again calculated by taking the average of the six items. The ordinal alpha coefficient for this scale across the four time points was .87, .88, .87, and .88, respectively.

Analytic Strategy

Following descriptive analyses, a series of latent growth curve models were fit to the data. All models were fit within the multilevel modeling framework using *lme4* (version 1.1-7; Bates et al. 2015), which is an add-on package for the R statistical language. Analyses proceeded in two steps. First, the shape of change over time in cognitive empathy was investigated. Because each individual provided reports a maximum of four times, we fit three different developmental shapes—no change, linear change, and quadratic change—to the data in separate models. Also of interest in this first step was determining whether variability existed between students in their change trajectories over time. Together, these models are referred to as the *unconditional trajectory models*. Second, we examined the influence of bullying and victimization on development of cognitive empathy over time. The scale scores for bullying and victimization were entered as time-varying covariates— first separately, then simultaneously—into the model determined to be optimal from the first step. In these *conditional models*, we controlled for the time-invariant effects of gender (dummy code; $0 =$ males, $1 =$ females) and ethnicity. Due to the large number of Latino/a participants in the sample, ethnicity was entered as a dummy-coded variable reflecting Latino/a status ($0 =$ not Latino/Hispanic, $1 =$ Latino/Hispanic). As part of this second step, we further included and tested interaction terms to examine whether the relationships between cognitive empathy and bullying (victimization) varied over time, as well as whether the two covariates influenced cognitive empathy development.

Maximum likelihood estimation was used to estimate each model. Nested models were compared using deviance (i.e., likelihood ratio) tests. Furthermore, the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) are reported for each model and were used to compare both nested and non-nested models, with lower values indicating a better fit to the data. Bootstrapping (Efron and Tibshirani 1993) was used to create 95 % confidence intervals for individual parameter estimates (percentile method, 1000 resamples per model). For the linear and quadratic trajectory models, time (and time^2 for the quadratic model) was entered as a predictor into each model as participants' biological age at the time of data collection. Time was centered at the average age of students in the spring of fourth grade.

In addition to repeated assessments being nested with students, students were also nested within classrooms and schools. In latent growth curve models, additional levels of nesting can be accounted for in the intercept term by including random effects that correspond to the nesting structure where time has been centered. However, including additional random effects for the growth rate is not straightforward if the nesting structure changes over time as is the case when students transition between classrooms or schools (see Sun and Pan 2014, for a review of this issue). In this study, few students ($n = 10$) changed schools during the fourth and fifth grades, but the majority of the sample changed schools by the sixth grade when transitioning to the middle school grade levels ($n = 240$ out of 332 students providing school information in the sixth grade). For the analyses reported below, the complicated nesting structure was handled as follows. In all analyses, the school level was ignored because (a) there were few schools in the fourth ($j = 14$) and

fifth ($j = 17$) grades, (b) interest was not in the classroom or school levels, and ignoring the school-level simply conflates the classroom-level variance estimates (Moerbeek 2004). Additionally, the cross-classified approach described in Sun and Pan (2012) was used to account for the nesting structure in all latent growth curve models. In this approach, only the intercept term contains a random effect for classrooms, while both the intercept and growth rate terms may contain a random effect for students.

Missing Data

Participants were included in analyses if they provided reports for the time-invariant covariates and all time-varying variables on at least one measurement occasion. With regard to demographic variables, one student (0.22 %) did not report their ethnicity and seven students (1.54 %) did not report their date of birth. Rates of missing data for the outcome variable (empathy) and the two predictors of primary interest (bullying, victimization) are shown for each measurement occasion in Table 1. As expected, missing data rates increased over the span of the study with approximately 35 % of observations at sixth grade follow-up. Due to missing data, the final analysis sample size was 431 students. Latent growth curve models estimated using maximum likelihood estimation are predicated on the assumption that missingness is ignorable, which means that (a) missing data values are *missing at random*—that is, the missing data values are generated by a completely random process conditional on observed values included in the analysis model; and (b) the process governing the missing data values is independent of the process governing the data (Singer and Willett 2003, pp. 157–159; Black et al. 2012). Importantly, the reason for missingness cannot be related to the values of the missing data values themselves (i.e.,

Table 1 Descriptive statistics

	N	% Missing	*M*	SD	*Mdn*	Min.	Max.	Skew.	Kurt.	ICC
Empathy										
Spring 4th	408	.11	3.23	0.73	3.40	1.00	4.00	−0.87	0.11	.05
Fall 5th	314	.31	3.21	0.67	3.20	1.00	4.00	−0.91	0.68	.06
Spring 5th	306	.33	3.06	0.70	3.20	1.00	4.00	−0.73	0.17	.07
Spring 6th	298	.35	2.83	0.68	2.80	1.00	4.00	−0.39	−0.01	.03
Bullying										
Spring 4th	407	.11	1.45	0.84	1.17	1.00	5.00	2.67	6.97	.08
Fall 5th	314	.31	1.33	0.62	1.17	1.00	5.00	3.19	11.29	.05
Spring 5th	306	.33	1.32	0.56	1.17	1.00	4.50	3.19	12.07	.05
Spring 6th	298	.35	1.42	0.63	1.17	1.00	5.00	2.93	11.09	.00
Victimization										
Spring 4th	408	.11	1.85	0.91	1.50	1.00	5.00	1.52	1.99	.06
Fall 5th	314	.31	1.76	0.86	1.50	1.00	5.00	1.47	1.88	.09
Spring 5th	306	.33	1.74	0.84	1.50	1.00	5.00	1.63	2.35	.02
Spring 6th	299	.35	1.69	0.81	1.33	1.00	4.83	1.50	1.61	.06

Percent missing based on original 456 eligible students

Min. minimum value, *Max.* maximum value, *Skew.* skewness, *Kurt.* kurtosis index, *ICC* intraclass correlation coefficient

missing not at random, or MNAR). We assume in the present study that missingness is ignorable.

Results

Descriptive Statistics

Descriptive statistics for the empathy, bullying, and victimization variables are shown in Table 1. Empathy decreased in an approximately linear fashion as reflected in both the mean and median scores over time. Similarly, victimization levels decreased in the control group throughout the study, also in an approximately linear fashion. Bullying levels initially decreased and then increased in the sixth grade, close to original levels. The skewness and kurtosis indices suggest that bullying and, to a much lesser extent, victimization, were positively skewed and leptokurtic. Empathy, on the other hand, was slightly negatively skewed but otherwise approximated normality. Finally, classroom-level ICCs

Table 2 Parameter estimates, 95 % confidence intervals, and fit for trajectory models

	Linear-fixed	Linear-random	Quadratic-random
Fixed effects			
Level 1 (repeated measures)			
Intercept	3.25 [3.19, 3.31]	3.25 [3.18, 3.33]	3.24 [3.16, 3.33]
Age	−0.21 [−0.25, −0.17]	−0.21 [−0.25, −0.17]	−0.14 [−0.22, −0.05]
Age^2			−0.03 [−0.08, 0.00]
Random effects parameters[a]			
Level 1 (repeated measures)			
Residual	0.53 [0.50, 0.55]	0.51 [0.48, 0.54]	0.50 [0.47, 0.53]
Level 2 (student)			
Intercept/intercept	0.44 [0.40, 0.49]	0.48 [0.42, 0.54]	0.47 [0.42, 0.54]
Age/age		0.17 [0.07, 0.23]	0.19 [0.07, 0.36]
Age^2/age^2			0.02 [0.01, 0.14]
Intercept/age		−0.40 [−0.66, −0.07]	−0.22 [−0.65, 0.40]
Intercept/age^2			−0.93 [−1.00, 0.90]
Age/age^2			−0.15 [−1.00, 0.96]
Level 3 (classroom)			
Intercept/intercept	0.12 [0.00, 0.19]	0.12 [0.00, 0.18]	0.13 [0.00, 0.20]
Model fit			
Deviance	2547.84	2542.48	2561.01
AIC	2557.84	**2556.48**	2581.01
BIC	**2583.76**	2592.76	2632.84

95 % confidence intervals obtained via parametric bootstrapping with 500 resamples. Boldface indicates lowest AIC or BIC value across reported models

AIC Akaike information criterion, *BIC* Bayesian information criterion

[a] Random effects parameter estimates and confidence intervals displayed in standard deviation/correlation metric

indicated low levels of between-classroom variation in empathy (range .03, .05), bullying (range .00, .08), and victimization (range .02, .09).

Unconditional Trajectory Models

To determine what trajectory shape best described average development of cognitive empathy in the control group and whether variability existed between participants in said developmental shape, a series of multilevel models were fit to the data and compared. First, an empty model (i.e., no predictors) with two intercept random effects terms for individuals and classrooms was fit to the data. This model implies that, on average, cognitive empathy did not change over time (results not reported; Deviance = 2673.47, AIC = 2681.47, BIC = 2702.23). Next, the centered age variable was added to the model, thereby implying linear growth over time in cognitive empathy. This model fit significantly better than the empty model according to the deviance test ($\Delta\chi^2(1) = 125.63$, $p < .001$) as well as the AIC ($\Delta-123.70$) and BIC ($\Delta-118.40$). Results from this model are shown in Table 2 under the heading "Linear-Fixed". Next, the effect of the age variable was allowed to vary randomly over participants. This model added one variance parameter and one covariance parameter to the previous model. This model fit significantly better than the previous model according to the deviance test ($\Delta\chi^2(1) = 125.63$, $p = .035$) and the AIC ($\Delta-1.30$) but not for the BIC ($\Delta+9.00$). Results from this model are shown in Table 2 under the heading "Linear-Random".

Although the BIC presented conflicting evidence regarding the significance of the two additional terms, we proceeded to compare this model to a model in which a quadratic term for time (i.e., age^2) was added. This effect was allowed to vary across participants; therefore, four additional parameters were estimated—a fixed effect for age^2, a variance for the random effects of age^2, and two covariances between the random effects for age^2 and
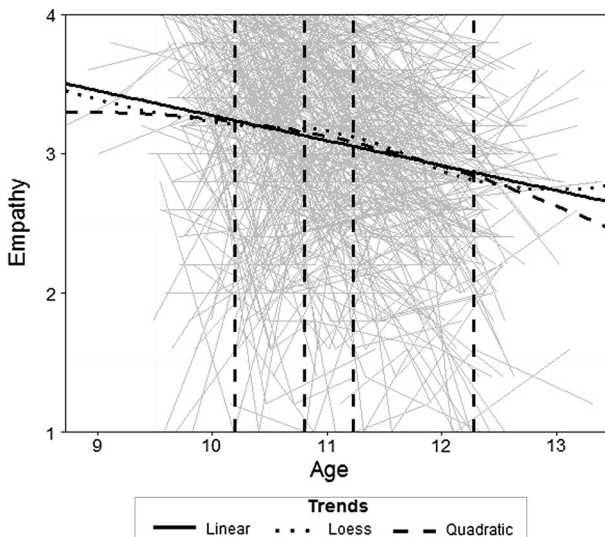

Fig. 1 Plots of individual trajectories (*gray*) and superimposed trend lines (*black*) for cognitive-empathy. *Vertical black dashed lines* correspond to average age during each measurement occasion (i.e., Spring 4th, Fall 5th, Spring 5th, Spring 6th

those for the intercept and age terms. This model did not show a significant improvement in model fit according to the deviance test ($\Delta\chi^2(1) = 3.79$, $p = .22$), AIC ($\Delta+4.20$), or BIC ($\Delta+24.90$). Results from this model are shown in Table 2 under the heading "Quadratic-Random". The findings reveal that the model that implied linear change in cognitive empathy over time appeared to fit the data best. This observation is underscored in Fig. 1 in whichparticipants' individual cognitive empathy scores over the four measurement occasions are shown (gray lines). Superimposed over the individual scores are three trend lines: a non-parametric trend line (i.e., a LOESS curve), a linear trend line, and a quadratic trend line. It is evident from the figure that the non-parametric trend and the quadratic trend closely follow the linear trend line. It is also clear that there is a large

Table 3 Parameter estimates, 95 % confidence intervals, and fit for conditional models

	Bully-only[a]	Victim-only[b]	Bully/victim
Fixed effects			
Level 1 (repeated measures)			
Intercept	3.79 [3.66, 3.92]	3.37 [3.24, 3.49]	3.79 [3.65, 3.93]
Age	−0.20 [−0.23, −0.16]	−0.21 [−0.24, −0.17]	−0.19 [−0.23, −0.15]
Bully	−0.37 [−0.44, −0.29]		−0.37 [−0.44, −0.30]
Victim		−0.05 [−0.10, −0.00]	0.01 [−0.04, 0.06]
Level 2 (student)			
Female	0.16 [0.07, 0.25]	0.20 [0.10, 0.32]	0.14 [0.05, 0.23]
Latino	−0.27 [−0.35, −0.17]	−0.30 [−0.40, −0.19]	−0.28 [−0.37, −0.19]
Random effects parameters[c]			
Level 1 (repeated measures)			
Residual	0.51 [0.48, 0.53]	0.51 [0.48, 0.53]	0.49 [0.46, 0.51]
Level 2 (student)			
Intercept/intercept	0.46 [0.27, 0.61]	0.55 [0.40, 0.67]	0.59 [0.38, 0.74]
Bully/bully	0.26 [0.15, 0.34]		0.25 [0.13, 0.34]
Victim/victim		0.21 [0.13, 0.28]	0.21 [0.13, 0.27]
Intercept/bully	−0.69 [−0.86, −0.02]		−0.47 [−0.83, 0.31]
Intercept/victim		−0.69 [−0.83, −0.30]	−0.70 [−0.96, −0.23]
Bully/victim			−0.04 [−0.66, 0.81]
Level 3 (classroom)			
Intercept/intercept	0.05 [0.00, 0.11]	0.07 [0.00, 0.13]	0.06 [0.00, 0.12]
Model fit			
Deviance	2355.28	2485.86	2338.10
AIC	2375.23	2505.86	**2366.10**
BIC	**2427.04**	2557.69	2438.60

95 % confidence intervals obtained via parametric bootstrapping with 500 resamples. Boldface indicates lowest AIC or BIC value across reported models

AIC Akaike information criterion, *BIC* Bayesian information criterion

[a] Six replications from the bootstrapping procedure did not converge

[b] Ten replications from the bootstrapping procedure did not converge

[c] Random effects parameter estimates and confidence intervals displayed in standard deviation/correlation metric

amount of variability in individual participants' change patterns—we return to this point later in the discussion section. Using observed means and standard deviations from Table 1, the total decrease in cognitive empathy observed in this sample equates to a Hedge's g effect size (Hedges and Olkin 1985) of .57.

Conditional Models

Results from the conditional models are shown in Table 3. First, gender and Latino status were entered as time-invariant student-level predictors of the random-intercept in the linear growth model described in the previous section (results not shown; Deviance = 2505.61, AIC = 2519.61, BIC = 2555.90). This served as a baseline model for comparison with the remaining conditional models. Next, the time-varying bullying and victimization variables were entered separately ("Bully-Only", "Victim-Only") and simultaneously ("Bully/Victim") as predictors of cognitive empathy; furthermore, these effects were allowed to vary across students, with covariances between all student-level random effects included in a particular model. The Bully-Only model fit the data better than the baseline model ($\Delta\chi^2(3) = 150.38$, $p < .001$; ΔAIC = −144.38, ΔBIC = −128.85). The results suggest that bullying was negatively associated with cognitive empathy across time, $b = -0.37$ [−0.44, −0.29]. Additionally, this effect appeared to vary across students ($\sigma_{Bully/Bully} = 0.26$ [0.15, 0.34]) and was negatively correlated with the random intercept term ($\sigma_{Intercept/Bully} = -0.69$ [−0.86, −0.02]) such that students engaging in more bullying at baseline also reported lower levels of empathy.

The Victim-Only model also fit significantly better than the baseline model, though not according to the BIC ($\Delta\chi^2(3) = 19.75$ $p < .001$; ΔAIC = −13.75; ΔBIC = 1.80). The negative effect of victimization on cognitive empathy over time was small ($b = -0.05$ [−0.10, −0.00]) though the effect did appear to vary across students ($b = 0.21$ [0.13, 0.28]) and was similarly negatively correlated with the intercept term ($b = -0.69$ [−0.83, −0.30]). Although the confidence interval for the victimization fixed effect did not include zero, a deviance test suggested that only adding the fixed effect of victimization (i.e., without specifying the effect as randomly varying over students) to the baseline model did not significantly improve model fit ($\Delta\chi^2(1) = 2.30$ $p = 0.13$; model results not reported). Furthermore, the victimization fixed effect in the Bully/Victim model—that is, the effect of victimization on cognitive empathy over time while controlling for engagement in bullying behavior and other covariates—was essentially zero ($b = .01$ [−0.04, −0.06]). Therefore, it appears that the negative effect of victimization on average may be too small to distinguish from noise, although the effect does appear to vary over students. On the other hand, the parameter estimate and confidence interval for the fixed effect of bullying in the Bully/Victim model did not change in magnitude compared to the Bully-Only model. With regard to the effects of the student-level control variables, parameter estimates were largely consistent across models; it appears that at baseline female students had significantly higher cognitive empathy scores compared to male students whereas Latino students reported significantly lower cognitive empathy scores.

Finally, interaction terms were added to the Bully/Victim model to test whether the effects of bullying or victimization on cognitive empathy varied across time and whether the two time-invariant covariates influenced the rates of change in cognitive empathy over time (model results not shown). Neither interaction term for bullying and victimization appeared to differ from zero (bullying × age: $b = -0.01$ [−0.07, 0.06]; victimization × age: $b = 0.03$ [−0.02, 0.08]), suggesting that the effects of bullying and victimization on cognitive empathy were constant over time. The interaction between gender and

time also did not appear to differ significantly from zero, $b = 0.01$ [−0.06, 0.09]. On the contrary, Latino/a status did appear to moderate the growth rates such that cognitive empathy declined less for those reporting being Latino/a, $b = .09$ [0.01, 0.16].

Discussion

The move from elementary to middle school corresponds with significant physical, emotional, and social changes. As such, studies are needed that explore developmental changes in social and cognitive functioning during this school transition. To date, however, few longitudinal studies have investigated the relationship between cognitive empathy and involvement in bullying and victimization, especially during this school transition. To that end, the present study examined not only naturally-occurring developmental changes in cognitive empathy over time, but also the effect of bullying and victimization involvement on changes in cognitive empathy during this school transition.

Developmental changes that occur during the move from a smaller elementary school setting to a larger middle school setting correspond with the transition from childhood to adolescence. During these transitions, children are faced with new social challenges and must renegotiate their social identities. As a result, some evidence suggests that these social pressures may contribute to increases in bullying and victimization involvement at this developmental time period (Pellegrini and Long 2002; Williford et al. 2011, 2014). Consistent with this evidence, descriptive results in the current study found that bullying rates initially decreased and then increased in sixth grade. Of note, bullying and victimization were both associated with lower levels of cognitive empathy throughout the study. However, the effect of victimization was small and became non-significant when both bullying and victimization were added to the model. Thus, it appears that bullying involvement is a primary correlate of lower cognitive empathy scores over time. This finding is consistent with prior evidence suggesting that cognitive empathy decreases as bullying behavior increases (see van Noorden et al., 2014). This trend may suggest that as children participate in bullying, their ability or, perhaps more accurately, their interest in taking the perspectives of others (cognitive empathy) may decrease, particularly during this school transition. Early adolescence involves great social difficulty as youth struggle to establish new social roles as they transition to middle school (Pellegrini and Long 2002). As students prioritize peer acceptance, they enter new environments in which they lack power and status, and youth may use aggression as a way to gain power and status among their peers (Hawley 2003; Vaillancourt et al. 2003). Thus, the middle school transition may represent a unique time when aggression toward other students as means of establishing social status is more typical, self-focus and a lack of awareness of others is more common, and for those youth at the low end of the empathy spectrum, bullying may be likely. Future research is needed to examine the relationship between cognitive empathy and bullying involvement during the transition to middle school that explicitly models specific social goals, such as seeking power and social status.

Of note, cognitive empathy decreased over time in the control group, and a linear trajectory was the best fitting shape for these data. Although prior evidence has found that cognitive empathy increases during adolescence as cognitive skills develop (Van der Graaff et al. 2014), this finding suggests that empathy scores may decline naturally during the transition to middle school. In concert with this finding, evidence from college samples notes a similar trend. For example, Konrath et al. (2011) found in their meta-analysis that

samples from 2000 to 2009, as compared to those from 1979 to 1999, evidenced greater declines in perspective taking empathy, leading the authors to assert that these declines may be a relatively recent phenomenon. However, other evidence suggests that empathy declines may be representative of cohort-related effects rather than age-related effects. Specifically, longitudinal analyses conducted by Grühn et al. (2008) revealed no age-related decline in cognitive and emotional empathy. It should be noted, however, that this sample consisted predominantly of adults, with an age range of 10–87 years at the beginning of the 12-year study. It is possible then that a decline in cognitive empathy may occur as children move into adolescence and a middle school setting only then to increase during the adolescent years until reaching adulthood. Future longitudinal studies following children into and throughout adolescence and adulthood would shed light on these naturally-occurring developmental changes.

Several notable student-level effects were also found. First, female students reported higher cognitive empathy levels at baseline as compared to male students. Recent evidence suggests that gender differences in cognitive empathy might be the result of self-report measures rather than neurobiological differences. Specifically, Michalska et al. (2013) found that, while girls scored higher on the self-report measure, no gender differences were revealed when examining the neurobiological measures, including hemodynamic responses or pupil dilation. The authors suggest that this may be due to girls' greater willingness to report their empathic experiences to others rather than due to underlying biological differences. Accordingly, future research would benefit from a more nuanced understanding of how the move from childhood to adolescence, particularly when this corresponds with a school transition, may affect cognitive empathy and may impact girls' and boys' development differently.

Second, Latino students reported lower cognitive empathy compared to non-Latinos at baseline, but showed a less steep decline over time. Ethnic differences in the development of cognitive empathy are not presently well-understood. While studies have examined empathy in diverse populations in early childhood (e.g., Burchinal et al. 2000) and college (e.g., Segal et al. 2011), no study to our knowledge has examined changes in empathy among diverse samples of early adolescents. At best, this finding is preliminary and must be further explored in future studies. Of note, however, is that these prior studies draw attention to the likelihood of confounding effects, such as poverty status, acculturation, and the lack of higher quality educational experiences, which may limit cognitive development and thus the development of cognitive empathy. For example, de Guzman and Carlo (2004) found that higher levels of acculturation were negatively related to prosocial behavior among Latino adolescents. Further investigation is needed to explore how race/ethnicity, poverty, acculturation, and related risks may impact cognitive development and youths' prosocial behavior before any definitive conclusions can be drawn.

In sum, the present study's findings suggest that cognitive empathy declines may occur in general during the transition to middle school and children who engage in bullying may exhibit particularly low levels during this time. As such, preventive interventions in the last few years of elementary school may be particularly effective in assisting students to make a successful transition to middle school. Interventions that promote the acquisition of cognitive empathy skills, consistent with many current practices (e.g., *Youth Matters* or social-emotional learning programs, like *Second Step*) may be especially useful. In fact, evidence points to the impact of *Second Step* on elementary school students' prosocial development, including caring and cooperative behavior (Cooke et al. 2007), and notes specific gains for Latino students (Brown et al. 2012).

Limitations

Study findings should be considered in the context of certain limitations. First, our investigation did not assess or measure levels of affective empathy, a potentially important component in the overall relationship between bullying, victimization, and empathy. Second, although a linear change model was found to fit these data best, there appeared to be heterogeneity in how individual students' scores changed over time. Although a quadratic term was added to the linear model to determine whether any curvature existed in cognitive empathy development, additional measurements would allow examination of whether cognitive empathy develops in a non-linear fashion; further, it may be the case that some students demonstrate different trajectory shapes, which could be illuminated in a model that does not assume a common change function. Third, we are precluded from making direct causal statements regarding the relation between bullying behavior and cognitive empathy; although the discussion above has focused on explanations of how engaging in bullying behavior may cause lower levels of cognitive empathy (i.e., greater bullying efficiency), we cannot rule out reverse causation. Fourth, levels of empathy and acts of bullying and victimization were limited to self-report data collection strategies that may include social desirability bias, minimization of stigmatized social interactions, and shared method variance. Fifth, the estimation procedure is predicated on ignorable missingness. It is possible that dropout/attrition or other non-response patterns were a function of the missing values themselves (i.e., specific levels of cognitive empathy). We note that many of the students lost to follow-up were missed due to scheduling; still, we cannot preclude the possibility that other factors (e.g., low-SES students) may contribute to the missing data process and may thus influence the results. Finally, the development of cognitive empathy is a complex process, beginning in infancy and continuing throughout adulthood. In this study, we were unable to assess additional predictors of cognitive empathy, such as relationships with parents (see Farrant et al. 2012) that may promote cognitive empathy development, or exposure to other traumatic life events (e.g., maltreatment; see Lee and Hoaken 2007) that may negatively impact a child's cognitive development. Future research should address these shortcomings using longitudinal designs spanning multiple developmental time periods to better understand the nature of cognitive empathy development.

Conclusions

Findings highlight the potential benefits in teaching cognitive empathy skills in interventions designed to reduce bullying involvement and promote social-emotional learning. Moreover, understanding the perspective of other students may be an important component in changing social norms about bullying behavior at the classroom and school levels. Optimally, interventions targeting the development of cognitive empathy skills would be provided before youth transition to middle school as this represents a time of elevated risk for bullying and victimization. Such training should aim to teach students skills as well as provide opportunities for practicing skills over time in order to saturate the school culture with values for considering others' perspectives and how one's behavior affects others. Finally, findings from this study suggest that training must also include the actual application of empathy skills to situations involving the likelihood of bullying during what may be a developmental period of relatively low empathy, particularly among youth who bully their peers.

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