



Applying Social Cognitive Theory to Explore Relational Aggression across Early Adolescence: A Within- and Between-Person Analysis

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Received: 30 August 2017 / Accepted: 26 July 2018
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Abstract

In the past two decades, there has been a significant amount of research on children's relational aggression, which has been found to be associated with psychosocial problems. Longitudinal studies have examined changes in relational aggression during early adolescence in relation to individual characteristics; however, most studies compare individual differences between people with regard to rates of relational aggression. A shortcoming to the current literature is the lack of studies that use a multilevel approach to examine individual differences (between-person) as well as the extent to which individuals deviate from their own *typical* levels (within-person) over time. In this study, within- and between-person psychological and peer-related predictors of rates of relational aggression over time were examined. Participants included 1,655 students in 5th–8th grade (mean age: 13.01) from four public middle schools in the Midwest, which consisted 828 females and 827 males. In terms of race and ethnicity, 819 (49.5%) were African Americans, followed by 571 (34.5%) Whites, and 265 (16%) Others. Longitudinal data were collected over four waves across two years of middle school. The findings indicated that contrary to the hypothesis that relational aggression would increase over time, there was no significant growth across time. Age, gender, and race were not associated with relational aggression over time; however, consistent with the Social Cognitive Theory, changes in within-person impulsivity, anger, and peer delinquency were all positively related to increases in relational aggression. At the between-person level of analysis, depressive symptoms and peer delinquency were related to relational aggression. Findings suggest that school-based programs that address anger management, impulsivity, empathy, and victimization could help prevent relational aggression.

Keywords Early adolescents · Relational aggression · Peer relations · Social cognitive theory · Social information processing theory

Introduction

Aggression during childhood is a predictor of future maladjustment during adolescence and into adulthood (see Card et al. 2008, for a review), which underscores the importance of understanding early aggressive behavior. Developmental psychology researchers have identified several types of interpersonal behaviors among adolescents, which inflict serious emotional harm. Physical violence broadly has received considerable attention from researchers, and also, significant advances have been made in the field's understanding of relational aggression. Relational aggression is a non-physical form of aggression where a person harms another's relationships or social standing (Crick et al. 1999; Leff et al. 2010). Unlike physical bullying, it includes behaviors where there is indirect intention of sabotaging a relationship or social standing (e.g., social exclusion of peers using the silent treatment) as well as a direct intent of

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harm (e.g., spreading malicious rumors, telling the victim they will be excluded from a peer group; Archer and Coyne 2005).

National survey estimates from U.S. school districts (students ages 12 to 18 years) in 2013 found that at school during the past year, 17% of female students and 13% of male students were subjects of rumors, and 6% of females and 5% of males were excluded from activities on purpose (Zhang et al. 2016). Another nationally representative survey of students (ages 11 to 16 years) found a quarter of youth (25.6%) had experienced social exclusion and nearly a third (31.9%) had rumors spread about them during the past 2 months (Wang et al. 2009). Relational aggression is associated with future psychosocial maladjustment as well as social problem-solving and emotion regulation deficits, peer relationship difficulties, internalizing problems (e.g., anxiety and depression) and externalizing problems (e.g., substance use; Card et al. 2008; Murray-Close et al. 2016).

Understanding relational aggression in early adolescence may be important because of the developmental milestone during this stage, as significant growth in cognitive and social areas occur in middle schools (Yoon et al. 2004). As part of efforts to understand and prevent relational aggression, researchers have explored factors associated with children's likelihood of engaging in this behavior. This work has identified multiple factors that can influence or inhibit relational aggression, including bio-behavioral factors (e.g., genetics, psychophysiological stress), cognitive and emotional factors (e.g., emotion regulation), and social factors (e.g., parenting, attachment, and family relationships) (Murray-Close et al. 2016). Although much of the published literature has been atheoretical, a few theories have point to explanations of what predisposes certain adolescents to engage in relational aggression. The social cognitive theory and the social information processing theory are two such theories, which can possibly elucidate why, and under what circumstances adolescents might be involved in relational aggression. Social cognitive theory suggests that adolescents use behaviors, like relational aggression, to gain a sense of satisfaction and self-worth (Gini 2006). Social information processing Theory, which is considered a leading heuristic perspective on aggression (Pettit et al. 2001), proposes that adolescents may process social information in cognitive steps before engaging in behaviors (Crick and Dodge 1994), such as relational aggression.

The purpose of this study is to test hypotheses shaped by social cognitive theory and social information processing theory using a large sample of youth surveyed at four time points across two years of middle school. Social cognitive theory posits that psychological factors, such as anger and other types of emotions can potentially influence social cognition of adolescents involved in aggression. It further

suggests that adolescents learn by observing others and observing delinquent acts of peers can reinforce aggressive behaviors. Social information processing theory asserts that certain emotions, such as anger and depressive symptoms, might reinforce deficits in self-regulatory skills that inhibit aggressive behavior. In this study, changes in relational aggression were examined based on variables identified by these theoretical frameworks. Specifically, peer-related (peer delinquency) and psychosocial (depressive symptoms, empathy, anger, and impulsivity) variables were examined, while controlling for demographics (age, gender, and race). This study represents a contribution to the literature because of its longitudinal design over two years and the attention paid to within and between-person changes in relational aggression.

Theoretical Frameworks

Social cognitive theory suggests that social cognitive processes, including thoughts, feelings, and behaviors, contribute to the development of aggression (Bandura 1986). Youth might attribute hostility to other's behaviors and react with anger and impulsively, leading to aggressive behavior. It also purports that individuals can acquire new behaviors by observing a model and adjusting their actions accordingly (Bandura 1986). Social cognitive theory is supported by research demonstrating a strong link between emotional dysregulation and peer victimization (Perry-Parish and Zeman 2011). A longitudinal study of 111 children (age 5½–12 years at Time 1 and age 8–14 years at Time 3), for example, found lower levels of emotion regulation predicted relational aggression (Bowie 2010). Moreover, peer victimization and delinquent peer affiliation might also predict relational aggression (Schwartz 2000). In a sample of 979 2nd through 4th grade children, Werner and Crick (2004), found that higher levels of peer rejection and friend's aggression predicted an increase in relational aggression among girls. Social information processing theory, on the other hand, proposes a model of social response that consists of five cognitive steps: *encoding* (i.e., searching for relative social information before responding), *interpretation* (i.e., giving meaning to cues), *response search* (i.e., generating possible behavioral response to situation), *response decision* (i.e., choosing response after evaluating potential consequences), and *enactment* (i.e., behavioral performance of the chosen response; Perry and Perry 1987). Aggressive youth may be deficient in one of these five steps when they encounter a frustrating event. They might conclude that others are attempting to frustrate them, which then increases aggression. Adolescents who are angry or impulsive may lack enactment and self-regulatory skills to inhibit aggression (Dodge 1980; Dodge and Frame 1982). Also, earlier studies by Crick and Dodge

(1994, 1999) indicated that the social information processing theory would be enhanced by considering the importance of emotion, as emotion is an important aspect of social information processing (Camodeca and Goossens 2005). Further, peer-victimized adolescents might attribute hostility to others and may respond aggressively (Dodge 1980; Dodge and Frame 1982).

A significant number of studies on relational aggression have considered demographic (e.g., gender) and psychological (e.g., depressive symptoms) determinants at the individual level. In addition, extant longitudinal studies have examined relational aggression in samples of elementary school children and high school-age adolescents. However, early adolescence is a period where peer group membership becomes increasingly important, and peer interactions become more frequent in middle school (Brown and Larson 2009). The increased amount of time adolescents spend with their peers and the pressure to fit in during early adolescence creates ample opportunity for relational aggression to emerge.

Relational Aggression

Demographics and relational aggression

Both cross-sectional and longitudinal studies have explored gender differences in relational aggression among adolescents. Research, in general, reveals girls engage in relational aggression more frequently than boys (Maccoby 2004; Ostrov et al. 2006; Salmivalli and Kaukiainen 2004). However, cross-sectional studies of school age children (4th graders; Prinstein et al. 2001) and early adolescents (grades 9–12; Putallaz et al. 2007) report no gender differences. Other cross-sectional studies, including one study of pre-school-age children (Juliano et al. 2006), and another with a pre-adolescent sample (ages 9 to 11 years; Yeung and Leadbeater 2007) report even higher rates of relational aggression among boys than girls. A more recent longitudinal study by Spieker and colleagues (2012) examined gender differences in the developmental course of relational aggression in children (ages 8–11 years). They found that while girls had higher mean levels of relational aggression, both boys and girls had different growth trajectories of relational aggression. Their findings provide some support for the gender-linked theory of relational aggression, which postulates that interpersonal relations are more important for girls and girls are more likely to respond aggressively when experiencing peer conflicts.

Examination of racial and ethnic differences in relational aggression is an important and under researched area (Young et al. 2006). The broader literature on aggression has reported racial differences. A cross-sectional study with a nationally representative sample of adolescents (grades

6–10), for example, reported that African Americans were more likely than youth of other races to engage in aggressive behavior (Wang et al. 2009). Other studies have found African American youth are more likely to be rated by their teachers and peers as “aggressive” (see Juvonen et al. 2003). While few studies have reported on racial differences in relational aggression, an early cross-sectional study found that African American children (age eight years old) were rated by their peers as relationally aggressive more frequently than White children (Osterman et al. 1994). It is conceivable that racial differences may exist in adolescents’ relational aggression. Moreover, exploring racial and ethnic differences in relational aggression can contribute to the development of culturally relevant prevention and intervention.

Internalizing problems as determinants of relational aggression

As social information processing theorists argue, depression is one of several types of emotion dysregulation that can negatively impact self-regulatory skills for minimizing negative behaviors, including relational aggression. Depression is an important indicator of children’s emotional adjustment (Grant et al. 2003). One short-term longitudinal study, which examined the association between relational and physical victimization, and depressive symptoms in a sample of 387 Taiwanese children (ages 9–11 years), found that relational victimization predicted subsequent depressive symptoms (Kawabata et al. 2014). The study also found that depressive symptoms were also predictive of later relational aggression (Kawabata et al. 2014). Children who display internalizing problems, such as depression, are likely to have continuing internalizing difficulties and are more likely to isolate themselves from peers (Grant et al. 2003). Such problems can persist over time, which can increase their risk of being asocial (Fanti and Henrich 2010). Children with internalizing problems are also at a heightened risk of antisocial behavior, and possibly the emergence of relational aggression (Marshall et al. 2015). Children with internalizing problems may misinterpret their peers’ social actions as malicious and may retaliate using relational aggression (Marshall et al. 2015).

Emotional determinants of relational aggression

The ability to experience emotions of others, or empathy, has been found to be positively related to prosocial behavior and altruism, and negatively related to adolescents’ aggressive behaviors in several studies. However, recent findings on the association between empathy and aggressive behavior have been inconsistent (Vachon et al. 2014). A meta-analysis of studies on the relationship between

empathy and aggression by Vachon and colleagues (2014) found that the association between empathy and all types of aggression (i.e., physical, sexual, and verbal) was weak. Examining preservice teachers' attitudes toward bullying, Craig et al. (2000) also found that empathy predicted intolerant attitudes toward relationally aggressive behaviors. Interestingly in their cross-sectional study on the association between empathy and three types of aggressive behaviors (i.e., indirect, verbal, and physical) in 10, 12, and 14-year-old adolescents, Kaukiainen and colleagues (1999) reported that empathy was negatively correlated with all types of aggression except indirect aggression in 12-year-old adolescents.

As previously stated, according to the social cognitive theory, emotional problems, including anger and impulsive behaviors can reinforce aggressive behavior (Bandura 1983). Emotions, such as anger and impulsivity are characteristics of aggressive and antisocial youth (Dodge et al. 1997), as aggressive youth may have fewer adaptive emotion regulation strategies and react with anger (see Orobio de Castro 2000). Not surprisingly, studies found anger and impulsivity to be correlated with children and adolescents' bullying and aggressive behavior (Low and Espelage 2014). Although relatively few, one cross-sectional study find anger to be linked to relational aggression (Peled and Moretti 2010); another longitudinal study, consisting of data collected at three time-points from a sample of adolescents in 5th to 7th grade found impulsivity to be strongly associated with multiple forms of aggression, including relational aggression (Low and Espelage 2014). From a sample of 226 undergraduate students, one cross-sectional study found that anger rumination positively predicted relational aggression (Peled and Moretti 2010). Relational aggression can function as a reactive, or defensive response to feeling anger towards an individual or a group (see Spieker et al. 2012).

Peer level determinants of relational aggression

Adolescent peer groups are important contexts to consider because relational aggression experiences tend to occur in a peer group context (Pellegrini et al. 1999). As expected, relational aggression can be the outcome of experiences in verbal or physical victimization, as adolescents with a prior incidence of peer victimization might possibly transfer these maladaptive patterns to their peers, particularly those whom they dislike (see, e.g., Brendgen et al. 2002). In addition, as hypothesized by social cognitive theory, adolescents' observations and experiences with their peer group networks can possibly trigger aggressive behaviors, such as relational aggression. Findings from extant studies point to an importance of understanding adolescents' peer group network on relational aggression (e.g., Yeung and

Leadbeater 2007). A short-term longitudinal study by Yeung and Leadbeater (2007) found that pre-adolescents (age 9–11 years) who experienced relational victimization were more relationally aggressive towards their peers.

Deviant peer group affiliation can play a causal role in the development of aggressive behavior. The presence of a selective process of homophily can leave adolescents prone to antisocial behaviors to seek out and form peer groups (Kandel et al. 1990). The selective process can lead to a situation in which the link between affiliation with deviant peer groups and aggressive behavior (e.g., relational aggression) arise because adolescents most prone to enter or form deviant peer groups are more prone to aggressive behavior (Fergusson and Swain 2002). In addition, affiliation with peers who engage in deviant behaviors has consequences because these youth are more likely to rely on aggression in their interpersonal relationships and engage in such behaviors as a result (Ellis et al. 2013). A longitudinal study (two time-points) by Low et al. (2013), which was collected from a sample of sixth and seventh graders, revealed that physical aggression among peer group members predicted individual levels of relational aggression over one year of middle school.

Current Study

Longitudinal studies over the years have examined changes in relational aggression during early adolescence in relation to demographic characteristics. However, a bulk of the aforementioned studies have compared individuals who reported high or low rates of demographic characteristics (e.g., gender) with regard to their individual rates of relational aggression. Significant developmental changes that occur in middle school can affect interpersonal relationships of early adolescents, as they seek independence from parents and have increasing interest in developing relationships with their peers (Yoon et al. 2004). The present study builds on the relational aggression research among adolescents by longitudinally exploring individual and interpersonal factors identified through social cognitive theory and social information processing theory. It was hypothesized that relational aggression would increase across the two-year study. Further, after controlling for age, gender, and race, it was hypothesized that higher levels of depressive symptoms, anger, impulsivity, self-reported victimization, and peer delinquency would be associated with greater relational aggression, with empathy being associated with less relational aggression. Using a longitudinal approach that models the person as a context and considers within- and between-person changes in the predictor variables (Hoffman and Stawski 2009) is unique in the relational aggression literature. Past longitudinal studies that examined

predictors of relational aggression have focused on between-person, time-invariant differences in perpetration of relational aggression. As a result, significant differences are only inferred at the level in which people differ from one another at high and low levels of the factor(s) of interest. For instance, longitudinal studies of changes in relational aggression during early adolescence in relation to individual characteristics have focused only on comparing individuals who reported high or low rates of individual characteristics with regards to their individual rates of relational aggression. These studies fail to partition variance at the within-person, time-variant level—an arguably more developmentally meaningful level of analysis—where differences in how individuals change or deviate over time from their respective averages are considered. By partitioning the variance at multiple levels of analysis, this controls for person level dependencies (i.e., how individual's scores are correlated over time) and, at the between-person level, controls for all observed and unobserved between-person confounds (Berry and Willoughby 2017). The approach will help discern such nuances in the relation between psychological and peer-related characteristics on rates of relational aggression over time.

Methods

Participants

Participants included 1655 students in 5th–8th grade from four public middle schools in the Midwest. Longitudinal data were collected over four waves from Spring of 2008 to Fall-Spring 2010. Ages ranged from 10 to 14 years, with a mean age of 13.01 ($SD = 0.95$) during the first wave of data collection. Students included 50% female ($n = 828$) and the racial distribution consisted of 49.5% African American ($n = 819$), 34.5% White ($n = 571$), 8.9% bi-racial ($n = 148$), 3.1% Hispanic ($n = 52$), 1.8% Asian or Pacific Islander ($n = 29$), and 1.6% American Indian or Alaska Native ($n = 26$). These four public schools are situated in a Midwestern school district where 60.4% of the students are African American, followed by 31.5% White, 2.6% Asian, 5.1% Hispanic, and .4% Multi-racial. Approximately 69.3% of the student population is considered low-income. The chronic truancy rate for the school district is 2.5%. The mobility rate is 30.1% district-wide.

Procedure

A waiver of active parental consent was approved by the institutional review board and school district administration. Parents of all students enrolled in the schools were sent letters informing them about the purpose of the study.

Parents were asked to sign the form and return it only if they were unwilling to have their child participate in the investigation. Parents were informed of the study through multiple outlets including school newsletters, emails to parents, local newspaper stories, and attendance of the research team at parent-teacher conferences. At the beginning of each survey administration, teachers removed students from the room if they were not allowed to participate, and researchers also reminded all students that they should not complete the survey if their parents had returned the form. This procedure was followed at each wave of data collection. Students were asked to consent to participate in the study through an assent procedure included on the cover-sheet of the survey and could skip questions and stop at any time. Students completed the survey during the homeroom period. Students were given a highlighter for participating.

A 95% participation rate was achieved at Wave 1. Retention rates varied between the waves because students had four opportunities to participate in the study. For example, students who did not participate in wave 2 were not excluded from subsequent waves of administration. Therefore, retention rates were calculated by dividing the lowest rate of participation by the highest rate of participation by grade-level. Retention rates were 78% for 6th graders at Wave 1 through 8th grade at Wave 4, 78% for 7th graders at Wave 1 through 8th grade at Wave 3, and 83% for 6th graders at Wave 2 through 7th grade at Wave 4. Retention rates were not calculated for 5th graders at Wave 1 due to the small sample size ($n = 53$), and 8th graders at Wave 1 due to their single point of administration. The overall retention rate for the entire study was approximately 80%.

Six trained research assistants, the primary researcher, and a faculty member collected data. At least two of these individuals administered surveys to classes ranging in size from 10 to 25 students. Students were first informed about the general nature of the investigation. Next, researchers made certain that students were sitting far enough from one another to ensure confidentiality. Students were then given survey packets and the survey was read aloud to them by trained graduate students. It took students approximately 40 min on average to complete the survey.

Student self-report measures were administered at four time-points separated by six months across two years from the same individuals over time.

Measures

Demographic variables

In terms of the demographic variables, students reported on their gender (male/female), their grade level (5–8th grade), their age in years, and their race/ethnicity. For race,

participants were given six options: African American (not Hispanic), Asian, White (not Hispanic), Hispanic, Native American, and other (with space to write in the most appropriate racial descriptor).

Relational aggression

Relational aggression includes exclusion, rumor spreading, and other activities meant to damage another child's reputation or social relationships, and was measured in this study with the five-item Relational Aggression Scale (Crick 1996). Students are asked how often they engage in certain behaviors at school (e.g., When I am mad at someone, I get back at the person by not letting the person be in my group anymore; Try to keep certain people from being in my group when it is time to hang out or do an activity). Response options are "Never", "Almost Never", "Sometimes", "Almost All the Time", and "All the Time". A confirmatory factor analysis supported the scale's construct validity (Crick 1996), and the scale's Cronbach alpha coefficients were .80–.81 across the four waves. Items were averaged and ranged from 0–4. The dependent variable for the current study is *relational aggression*.

Physical aggression

Physical aggression includes physical fighting and was measured with the five-item Illinois Fight Scale (Espelage and Holt 2001). Students are asked how often they engaged in physical fighting in the last 30 days (e.g., got in a physical fight, hit back when hit first). Response options include: "Never"; "1 or 2 times", "3 or 4 times", "5 or 6 times", and "7 or more times". The construct validity of this scale has been supported via exploratory and confirmatory factor analysis (Espelage and Holt 2001). This scale had Cronbach alpha coefficient of .83–.85 across the four waves of data collection. Items were averaged and ranged from 0–4. Physical aggression was controlled for in our analyses.

Depressive symptoms

Depressive symptoms were measured with the Orpinas Modified Depression Scale (Orpinas 1993), which includes six items that asks adolescents how often they felt or acted in certain ways (e.g., "Did you feel happy", "Did you feel hopeless about your future") in the previous 30 days. Response options are "Never", "Not Often", "Sometimes", "Often", and "Almost Always". Greater scores indicate more depressive symptoms. The Modified Depression scale has demonstrated strong construct validity through factor analyses and good internal consistency (.74) when administered to adolescents 10 to 18 years of age (Espelage et al.

2012; Orpinas 1993). Cronbach alpha coefficients ranged from .83–.84 across the four waves. Items were averaged and ranged from 0–4.

Empathic concern

Empathic concern is an adolescents' ability to listen, care, and trust others and was measured with the 5-item scale of the Teen Conflict Scale (Bosworth et al. 1999). Students were asked to indicate how often they would use items in the scale to describe themselves. Examples include: "I can listen to others", and "I get upset when my friends are sad". Response options are recorded on a 5-point Likert-type scale with options ranging from "Never", "Seldom", "Sometimes", "Often", and "Always". Cronbach alpha coefficients ranged from .70–.72 across the four waves. Items were averaged and ranged from 0–4.

Impulsivity

Impulsivity is difficulty in controlling one's behavior and completing tasks. It was measured with the 4-item Impulsivity subscale from the Teen Conflict Survey (Bosworth et al. 1999). Students are asked how often they would say the following statements about themselves: "I have a hard time sitting still", "I start things but have a hard time finishing them", "I do things without thinking", and "I need to use a lot of self-control to keep out of trouble". Response options are "Never", "Seldom", "Sometimes", "Often", and "Always". Cronbach alpha coefficients ranged from .73–.76 across the four waves. Items were averaged and ranged from 0–4.

Anger

Anger was measured with the 4-item subscale of the Modified Aggression Scale (Bosworth et al. 1999) asks students to report how often in the past 30 days they engaged in specific behaviors considered to be indicators of anger. Example items include "I got in a physical fight because I was angry" and "I lost my temper for no reason". Responses options are "Never", "1 or 2 times", "3 or 4 times", "5 or 6 times", or "7 or more times". Cronbach alpha coefficients ranged from .74–.76 across the four waves. Items were averaged and ranged from 0–4.

Self-reported victimization

Self-reported victimization was defined as being a target of verbal and physical victimization from peers and was measured with the 4-item University of Illinois Victimization Scale (Espelage and Holt 2001). Students are asked how often the following happened to them in the past

30 days: “Other students called me names”; “Other students made fun of me”; “Other students picked on me”; and “I got hit and pushed by other students”. Responses options are “Never”, “1 or 2 times”, “3 or 4 times”, “5 or 6 times”, or “7 or more times”. The construct validity of this scale has been supported by exploratory and confirmatory factor analysis (Espelage and Holt 2001). Scores have converged with peer nominations of victimization (Espelage and Holt 2001). Higher scores indicate more self-reported victimization. Cronbach alpha coefficients ranged from .90–.92 across the four waves. Items were averaged and ranged from 0–4.

Peer delinquent behavior

Peer delinquent behavior was defined as behaviors of one’s friends. It was measured with the 7-item Peer Delinquent Behavior scale (Elliott 1990), which asks students to report how many of their friends, in the past year engaged in delinquent behaviors. Example items are “Hit or threatened to hit someone”, “Purposely damaged or destroyed property that did not belong to them”, and “Used alcohol”. Responses options are “None of them”, “Very few of them”, “Some of them”, “Most of them”, and “All of them”. In Cronbach’s alpha coefficients ranged from .86–.90 across the four waves. Items were averaged and ranged from 0–4.

Analysis

To address the study hypotheses, a taxonomy of growth models was fit to the data (Singer and Willett 2003). First, a null model that had an intraclass correlation (ICC) of approximately 0.40 that indicated about 40% of the variance in relational aggression was between-people. Second, the functional form of our data were tested, and contrary to our hypothesis that relational aggression would increase over time, there was a very small decrease across the two years. In subsequent models, hypotheses were tested through a stepwise procedure by first entering demographic variables into an initial model, followed by within-person effects, and finally the between-person effects. Within-person effects (time-variant) examine the extent to which individuals deviate from their own *typical* levels (i.e., individual mean) at any given time point, where between-person effects (time-invariant) examine average differences between people (i.e., grand-mean) over time. Both levels of analysis carry different substantive meaning that provides a more nuanced understanding of the development of relational aggression across adolescence development. For example, between-person effects of physical aggression examine the extent to which individuals differ from one another in physical aggression over time (trait-like). That is, on average, some

people will have higher levels of aggression than other people over time and higher rates may in turn be associated with higher rates of relational aggression. Within-person effects of physical aggression examine the extent to which individuals differ from their own *typical* levels (state-like) of physical aggression at any given time point and its association with relational aggression at the same time point. The within-person level of analysis is arguably a more developmental appropriate level of analysis to examine changes within people over time because it examines state-like deviations from one’s own mean, rather than the grand mean as with between-person effects. Classroom or school levels were not modeled in the current study due to low variance at each of the respective level.

Within-person Level 1 variables were person-mean-centered, as such, differences refer to deviation from one’s individual mean. Level 2 variables were grand-mean-centered and refer to average differences between people over time. All models were fit in Mplus 7.4 using Full Information Maximum Likelihood (FIML) to address missing data and robust maximum likelihood to adjust for non-normality. All models controlled for physical aggression in order to isolate unique predictors of relational aggression.

Results

Preliminary Results

Table 1 presents frequencies and percentages for the demographic data at Wave 1. Means and standard deviations for the study variables averaged across the four waves are also included in Table 1. Correlations for all variables (averaged across four waves) can be found in Table 2. Though some of the averages over time were modest, the standard deviations among these variables indicated that there was a fair amount of variability both within and between people in each respective variable. Within-person and between-person variables are orthogonal to one another and thus share no variance. As such, any correlation between a within- and between-person variable will be 0. Table 3 displays a taxonomy of three nested models labeled Model 1–Model 3. Gender was not significantly associated with relational aggression over time, but age and race were (see Table 3, Model 3). Age was associated with slight decreases in relational aggression over time. Compared to White adolescents, African Americans were associated with slight decreases in relational aggression over time. However, the Other racial/ethnic group was not significant compared to White adolescents.

Table 1 Means (or frequencies) and standard deviations (or %) among demographics, predictors, and outcome variables

Variables	<i>M</i>	<i>SD</i>	<i>n</i>	%
<i>Demographics</i>				
Age (in years)	13.01	0.95		
Female			828	50
White			571	34.5
African American			819	49.5
Other			265	16
<i>Within-Person Variables</i>				
Physical aggression	0.43	0.28		
Depressive symptoms	1.58	0.37		
Empathy	1.84	0.36		
Impulsivity	1.31	0.45		
Anger	0.50	0.38		
Self-reported victimization	0.56	0.39		
Peer delinquency	0.65	0.32		
<i>Between-Person Variables</i>				
Physical aggression	0.43	0.54		
Depressive symptoms	1.58	0.74		
Empathy	1.84	0.80		
Impulsivity	1.31	0.92		
Anger	0.50	0.74		
Self-reported victimization	0.56	0.72		
Peer delinquency	0.65	0.70		
<i>Dependent Variable</i>				
Relational aggression	0.23	0.42		

Within-Person Effects

At the within-person level, three of the six main effects were found to be significantly associated with relational aggression across the four waves (see Table 3, Model 3). As hypothesized, time specific changes in impulsivity, anger, and peer delinquency were positively associated with concurrent increases in relational aggression. That is, at time points when individuals reported higher levels of impulsivity, anger, and peer delinquency than their own individual average, they reported higher respective rates of relational aggression at the same time point. For example, a one-unit increase in within-person physical aggression was associated with a .08 unit increase in relational aggression. Specifically, controlling for average rates of physical aggression (trait-like), at time points when individuals reported more physical aggression than *usual* they in turn report higher rates of relational aggression. These effects corresponded to standardized effects of .08 for impulsivity, .06 for anger, and .11 for peer delinquency. However, contrary to the study hypotheses, depressive symptoms, empathy, and victimization were not significantly associated with relational aggression. Physical aggression was also predictive of relational aggression over time.

Between-Person Effects

At the between-person level, physical aggression, depressive symptoms, and peer delinquency were significantly associated

Table 2 Correlations among all study variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Relational agg	–														
2. WP physical agg	.13**	–													
3. WP depressive	.046*	.15**	–												
4. WP empathy	–.01	–.06**	.09**	–											
5. WP impulsivity	.10**	.15**	.32**	.00	–										
6. WP anger	.10**	.48**	.12**	–.04*	.16**	–									
7. WP self-rep vict	.04*	.34**	.20**	–.01	.16**	.23**	–								
8. WP peer delinq	.12**	.24**	.25**	–.02	.20**	.22**	.06**	–							
9. BP physical agg	.47**	0	0	0	0	0	0	0	–						
10. BP depressive	.24**	0	0	0	0	0	0	0	.29**	–					
11. BP empathy	–.08**	0	0	0	0	0	0	0	–.18**	.18**	–				
12. BP impulsivity	.30**	0	0	0	0	0	0	0	.39**	.50**	–.03*	–			
13. BP anger	.35**	0	0	0	0	0	0	0	.60**	.36**	–.14**	.40**	–		
14. BP peer vict	.26**	0	0	0	0	0	0	0	.37**	.36**	.05**	.31**	.29**	–	
15. BP peer delinq	.34**	0	0	0	0	0	0	0	.48	.33**	–.20**	.39**	.46**	.23**	–

Agg aggression, Vict victimization, Delinq delinquency, WP within-person, BP between-person

Note: Correlations among the study variables were calculated, averaging across years. Between-Person and Between-School variables are orthogonal and thus share no variance

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

Table 3 Parameter estimates (SE) of fixed and random effects from a series of individual growth models predicting relational aggression

Fixed effects	Model 1	Model 2	Model 3
Intercept	0.28* (0.12)	0.25* (0.12)	0.58*** (0.12)
Linear growth	-0.02* (0.01)	-0.01 (0.01)	-0.02* (0.01)
Gender	0.01 (0.02)	0.01 (0.02)	0.01 (0.02)
Age	-0.01 (0.01)	-.01 (0.01)	-0.02** (0.01)
African American	0.32 (0.02)	0.03 (0.02)	-0.07*** (0.02)
Other	-0.02 (0.04)	-0.02 (0.04)	-0.05 (0.03)
WP physical aggression		0.08** (0.03)	0.08** (0.03)
WP depressive symptoms		0.01 (0.02)	0.01 (0.02)
WP empathy		-0.01 (0.02)	-0.01 (0.02)
WP impulsivity		0.06*** (0.02)	0.06*** (0.02)
WP anger		0.04* (0.02)	0.04* (0.02)
WP self-reported victimization		-0.02 (0.02)	-0.02 (0.02)
WP peer delinquency		0.12*** (0.02)	0.12*** (0.02)
BP physical aggression			0.25*** (0.02)
BP depressive symptoms			0.03* (0.01)
BP empathy			-0.01 (0.01)
BP impulsivity			0.02 [†] (0.01)
BP anger			0.02 (0.02)
BP self-reported victimization			0.03 [†] (0.02)
BP peer delinquency			0.11*** (0.02)
<i>Random effects</i>			
Within-person intercept	0.13*** (0.01)	0.12*** (0.01)	0.12*** (0.01)
Between-person intercept	0.07*** (0.01)	.07*** (0.01)	0.03*** (0.00)
<i>Fit indices</i>			
-2LL	2860.0	2695.3	2236.0
AIC	2875.4	2725.3	2280.0
BIC	2897.0	2812.2	2337.6
DF	8	15	22

WP within-person, BP between-person

Note: Model 1 added the main effects of gender (reference: male), age, and race dummy variables of African American and Other, with White as the reference group. Model 2 added the within-person main effects of (M1 to M2; $\Delta LR = 164.7$, $\Delta df = 7$, $p < .001$). Model 3 added the between-person main effects (M2 to M3; $\Delta LR = 459.3$, $\Delta df = 7$, $p < .001$)

[†] $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

with relational aggression across the four waves. For example, an one unit increase in between-person physical aggression was associated with a .12 increase in relational aggression over time. That is, individuals that report higher average levels of physical aggression over time also report higher levels of relational aggression over time. Additionally, impulsivity and self-reported victimization predicted slight increases in relational aggression over time. Contrary to the study hypotheses, empathy and anger did not predict relational aggression (see Table 3, Model 3). The standardized effect indicated that a one standard deviation increase in physical aggression was associated with a .50 standard deviation decrease in relational aggression. Additionally, impulsivity, depressive symptoms, self-reported victimization, and peer delinquency all had significant positive associations

with relational aggression. This corresponded to a standardized effect of .07 for impulsivity, .09 for depressive symptoms, .07 for self-reported victimization, and .27 for peer delinquency respectively.

Discussion

The aim of this study was to apply social cognitive theory and social information processing theory to a longitudinal examination of relational aggression among middle school youth, controlling for physical aggression. Unlike past studies (e.g., Ostrov et al. 2006), gender was not associated with relational aggression, but relational aggression was associated with other demographic variables such as age (e.g., younger youth) and race (e.g., African American). This finding seems to suggest that although gender differences have been examined in the research on relational aggression, age and race are important variables to consider when tracking changes in relational aggression. Although relational aggression can be problematic for adolescents of any age or race, the findings here suggest that relational aggression was associated with being younger in middle school. For younger adolescents who are transitioning to middle school, peer status and peer relations become increasingly important, and peer conflicts can manifest in bullying or relational aggression. Similar to bullying, as adolescents become older and more “mature”, they may be less involved in peer-to-peer aggression, including relational aggression. Also, as indicated by the study findings, African American adolescents are less likely to be at risk of relational aggression relative to their White counterparts, which seems to suggest racial differences in relational aggression among early adolescents. Despite this difference, it is unclear why adolescents of a certain racial group are less likely at risk of relational aggression; future research might attempt to explore the racial differences in relational aggression, which can help identify certain factors that increase the risk, as well as those that decrease the risk.

At the within-person level, time specific changes in impulsivity, anger, and peer delinquency were positively related to relational aggression, similar to other studies of relational aggression (Ellis et al. 2013) and consistent with social cognitive theory (Bandura 1986). At the between-person level, findings suggest that depressive symptoms and peer delinquency were significantly related to adolescents' relational aggression. The relationship between impulsivity, anger and depression and relational aggression seems to suggest that adolescents who experience these emotions might be prone to engage in behaviors that are aimed at hurting others or sabotaging others. It is possible that these adolescents engage in relational aggression in an attempt to “feel better” or perhaps as an “act of vengeance.” Researchers

might build on this finding by examining the motivations for relational aggression in adolescents who experience these emotions. Moreover, the significance of peer delinquency in early adolescents' relational aggression found in this study also seems to suggest that relational aggression might be associated with delinquent behaviors. Future research might consider exploring the underlying mechanisms linking peer delinquency and relational aggression.

Anger and affiliating with delinquent peers appear to be the strongest predictors of increases in relational aggression. Anger has been consistently a potent predictive of other forms of aggression (e.g., bullying, physical aggression), the findings suggest that anger is predictive of relational aggression, even after controlling for physical aggression. Further, adolescents who affiliate with friends who are engaging in delinquent behaviors (e.g., using drugs, fighting) are likely to be influenced by their friends to perpetuate relational aggression, by socially excluding a disliked peer or threatening to damage his or her peer relations. The social nature of aggressive behaviors may be why delinquency and physical aggression were associated with relational aggression at both levels of analysis. That is, regardless of average levels, delinquency and physical aggression were associated with relational aggression; and higher average levels were also associated with higher rates of relational aggression. Both trait-like levels and state-like deviations were associated with increases in relational aggression suggesting that small changes in delinquency and physical aggression are closely associated with changes in relational aggression. Future research might build on the current finding by examining whether deviant peer relations might mediate or moderate the link between delinquent behavior and relational aggression.

This study is not without limitations. Data were drawn from one Midwest community and findings might not be generalizable to other communities. Further, the measure of relational aggression in the current study, included only self-report of social exclusion, threatening behaviors, and telling lies. Future research might consider peer-nominations and expand the assessment to cyber-relational aggression. Additionally, although the current study examines within- and between-person effects, it was not able to examine classroom or school level effects due to low amount of variability at these levels of analysis. Future studies may attempt to examine the nested nature of individuals within classrooms or schools in the developmental of relational aggression across adolescence.

Conclusion

Findings from the present study advance understanding about relational aggression among middle school youth.

Examining relational aggression longitudinally and examining within- and between-person differences revealed that although on average relational aggression was rather stable across the two years, there were several predictors that were associated with fluctuations in relational aggression across the middle school years. Anger and impulsivity were found to be associated with changes in relational aggression, two potential candidates for targeted intervention for individual youth. Affiliating with delinquent peers was also significant, suggesting that relational aggression might be part of larger externalizing behavior problems among youth. Given there are relatively few longitudinal studies exploring the predictors of relational aggression across middle school years, this study adds significantly to the literature. Findings from this study add to the understanding of relational aggression and how predictors at various contexts—from individual (demographic) to interpersonal (e.g., peer delinquency) can foster or inhibit such behavior at various stages of early adolescent development. That said, much more research using rigorous, longitudinal research designs need to be conducted to advance the field's understanding of adolescents' relational aggression.

Authors' Contributions D.L.E. conceived the study, designed the study, collected data, secured IRB, drafted the manuscript and revised the manuscript, and edited the manuscript; G.J.M. conducted the analyses and wrote the Methods and the Results section; J.S.H. wrote the Introduction and the Literature Review, and edited the article; S.M.R. contributed to the Introduction and edited the article. All authors read and approved the final manuscript.

Funding Data in this manuscript were drawn from a grant from the CDC (1U01/CE001677) to the lead author.

Data Sharing and Declaration This manuscript's data will not be deposited.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical Approval 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.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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