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Bidirectional Pathways between Relational Aggression and Temperament from Late Childhood to Adolescence

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Abstract

Relational aggression is linked to numerous adverse consequences. However, we know little about how temperament leads individuals to become perpetrators/victims of relational aggression, or how being a perpetrator/victim influences the development of temperament. We used longitudinal data from 674 Mexican-origin youth to examine relations between relational aggression and mother- and child-reported temperament from 5th grade ($M_{age}=10.8$; $SD=0.60$) through 11th grade ($M_{age}=16.8$; $SD=0.50$). Results show that: (a) high Negative Emotionality and low Effortful Control predicted increases in victimization; (b) low Effortful Control predicted increases in perpetration; (c) victims increased in Negative Emotionality and decreased in Effortful Control; and (d) perpetrators increased in Negative Emotionality and Surgency. Thus, temperament serves as both an antecedent to *and* a consequence of relational aggression.

Keywords

relational aggression; temperament; personality; childhood; adolescence; longitudinal

Adolescence is a developmental period marked by rapid maturational changes, shifting societal expectations, conflicting role demands, and increasingly complex relations with parents and peers. One hallmark of the transition from childhood to adolescence is a shift away from the family context and toward the peer context, which is often precipitated by youth spending more time away from home and expanding their peer networks. As youth attempt to fit into this new environment, the need to be accepted by peers becomes increasingly salient, as well as the sometimes competing need to define the self in unique ways (Galambos & Costigan, 2003). Together, these increasingly complex transactions between the child and his/her interpersonal environments may profoundly influence pathways that lead to maladaptive forms of interpersonal behavior as well as the development of basic personality traits.

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Relational aggression is one interpersonal transaction that becomes particularly important during the transition from childhood to adolescence (Bjorkqvist, Lagerspetz, & Kaukiainen, 1992; Cote et al., 2007; Coyne et al., 2006; Ettekal & Ladd, 2015; Murray-Close, Ostrov, & Crick, 2007; Underwood, Beron, & Rosen, 2011). Relational aggression is a form of bullying that entails an intent to “*harm others through the use of purposeful manipulation or exclusion in the context of the peer relationship*” (Crick & Grotpeter, 1995). Relationally aggressive behaviors include spreading rumors or gossiping about another child, excluding other children or getting someone else to exclude them, and/or verbally picking on someone in order to manipulate their social status or standing. These behaviors become more common in late childhood and early adolescence, in part because youth develop more complex verbal and social-cognitive skills such as perspective-taking and social intelligence (Crick et al., 1999; Kaukiainen et al., 1999; Maccoby & Jacklin, 1974) that allow them to execute more subtle forms of aggression. Although relational aggression was initially thought to be used predominantly by girls, current research suggests that both boys and girls commonly engage in relational aggression (Archer & Coyne, 2005; Bjorkqvist et al., 1992; Card et al., 2008; Coyne et al., 2006; Crick, 1997; Crick & Grotpeter, 1995; Tackett & Ostrov, 2010; Tackett, Waldman, & Lahey, 2009).

Relational aggression has a wide range of well-documented adverse consequences. Perpetrators of relational aggression are more likely to have poorer friendship quality, poorer academic performance, suicidal ideation, and higher levels of substance use and other forms of antisocial behavior (Archer & Coyne, 2005; Card et al., 2008; Crick, 1997; Crick, Ostrov, & Werner, 2006; Crick & Grotpeter, 1995; Espelage & Holt, 2013; Preddy & Fite, 2012; Prinstein, Boergers & Vernberg, 2001; Risser, 2013; Skara et al., 2008; Tackett & Ostrov, 2010), although recent research notes that some relational outcomes (peer rejection, acceptance, friendships) may vary by aggression subtypes *within* boys and girls (Ettekal & Ladd, 2015). Interestingly, many of these same consequences are also experienced by the *victims* of relational aggression (Archer & Coyne, 2005; Card et al., 2008; Crick et al., 2001; Crick & Grotpeter, 1995; Espelage & Holt, 2013; Prinstein, Boergers & Vernberg, 2001; Risser, 2013; Sullivan, Farrell, & Kliewer, 2006). In addition, victims are prone to other negative outcomes, including anxiety, depression, eating disorders, and lower self-esteem (Craig, 1998; Crick & Bigbee, 1998; Neary & Joseph, 1994; Spieker et al., 2012; Werner & Crick, 1999).

An important but largely unanswered question is how children *become* perpetrators or victims of relational aggression. Previous studies have found that poor emotion regulation, inflated self-views, certain forms of internalizing and externalizing psychopathology, media exposure to relational aggression, and experiencing child abuse/maltreatment can influence youth to relationally aggress against other children (Archer & Coyne, 2005; Card et al., 2008; Cook et al., 2010; Coyne, 2015; Cullerton-Sen et al., 2008; Kawabata et al., 2011; Mayeux, 2014; Miller & Lynam, 2003; Nelson & Crick, 2002; Ojanen, Findley & Fuller, 2012; Ostrov & Houston, 2008; Tackett et al., 2014; Underwood, Beron & Rosen, 2011). In contrast, researchers have found that *victims* of relational aggression often lack social skills and have difficulty resolving social problems (Archer & Coyne, 2005; Champion, Vernberg, & Shipman, 2003; Cook et al., 2010), but these pathways are complex and more poorly understood than pathways to perpetration. Previous research has shown that children who

engage in aggression are more likely to become victims of relational aggression in early and middle childhood (Ostrov, 2008; Ostrov & Godleski, 2013). Thus, although perpetrators and victims of relational aggression experience many of the same adverse consequences, the developmental pathways leading to perpetration and victimization seem to be quite distinct.

An area of research less understood is how normative personality traits differentially predict *who* becomes a perpetrator or victim of relational aggression, and conversely, how perpetrating or being a victim of relational aggression subsequently affects the development of temperamental traits. It is possible that the interpersonal dynamics characterizing relational aggression are manifestations of enduring individual differences in underlying traits. The behaviors that occur within the context of a relationship transaction are *not* generated entirely through dyadic, interactional processes, but rather individuals create the micro-interactional processes that characterize adaptive and maladaptive relational behavior (Neyer & Asendorpf, 2001; Robins et al., 2002). In particular, each individual brings to the relational context a set of temperamental tendencies that shape his/her thoughts, feelings, and behaviors.

Relational Aggression and the Development of Temperament

Individual differences in reactivity (affective and motivational processes to stimuli) and regulation (top-down control of reactive processes) are fundamental aspects of temperament in childhood and adolescence (Rothbart, 2011). Several studies suggest that traits reflecting heightened reactivity toward negative stimuli (e.g., high Negative Emotionality/Neuroticism) and poor regulatory control (e.g., low Effortful Control, low Agreeableness, and low Conscientiousness) are associated with both perpetrating and being victimized by relational aggression (Bollmer, Harris, & Milich, 2006; De Bolle & Tackett, 2013; Jensen-Campbell & Malcolm, 2007; Georgesen, Harris, Milich, & Young, 1999; Gleason et al., 2004; Tani, Greenman, Schneider, & Fregoso, 2003; Marsee & Frick, 2007; Ojanen, Findlay, & Fuller, 2012; Tackett et al., 2013; Tackett et al., 2014). However, we know little about the degree to which these traits predict *increases* or *decreases* over time in relational aggression, due to the dearth of longitudinal research. Moreover, even less is known about how relational aggression influences the development of temperamental traits during childhood and adolescence. Past research has shown that relational aggression is related to later symptoms of psychopathology, such as anxiety, depression, psychopathy, and personality disorders (Miller & Lynam, 2003; Murray-Close, Ostrov, & Crick, 2007; Ostrov & Houston, 2008; Tackett et al., 2014), but whether relational aggression shapes normative personality development, especially in tandem with competing reciprocal forces, is not well understood.

Longitudinal associations between relational aggression and temperament could be driven by several transactional developmental processes, including *selection*, *evocation*, and *socialization*. For example, it is possible that adolescents who have poorer self-regulation, get frustrated more easily (i.e., higher Negative Emotionality), or seek out rewarding experiences may *select* into maladaptive bullying roles and increasingly engage in perpetrating behaviors because this allows them to express their dispositional tendencies in the peer context. In contrast, it seems unlikely that adolescents would actually *select* into becoming a *victim* of relational aggression. Instead, it is more plausible that adolescents

with certain dispositions *evoke* responses from their peers that lead them to be targeted and victimized. That is, youth who are anxious and irritable, and who lack the self-regulatory skills to refrain from provoking others, may elicit retaliation and subsequent victimization from their peers.

Conversely, the experience of perpetrating and being a victim of relational aggression may lead to changes in temperamental traits. In other words, relational aggression may *socialize*, or reinforce, the development of certain temperamental tendencies. Being a perpetrator of relational aggression may lead to *changes* in socially maladaptive traits, such as higher negative emotionality and poorer regulation, over time. For example, continually aggressing against other children may adversely *socialize* the adolescent's ability to regulate his/her behavior, or make the perpetrator even more frustrated or irritated, which then leads them to relationally aggress against other children even more. Similarly for victims of relational aggression, it is possible that being continually victimized may lead the adolescent to become more anxious and fearful, and with fewer cognitive and emotional resources to regulate his/her behavior. Thus, these dispositions may lead to *increases* in victimization through a vicious cycle, whereby adolescents *evoke* hostile responses from their peers, which then leads them to become even less controlled and more anxious or irritable, and consequently more victimized.

To fully understand which personality traits contribute to increases in relational aggression, it is vital to understand the traits that cause adolescents to *self-select* into or *evoke* relationally aggressive behaviors. Similarly, it is also important to understand how being a perpetrator or a victim *socializes*, or reinforces, temperamental tendencies over time. Given the transitional nature of these years, adolescence is an important developmental period in which to examine the implications of temperamental characteristics for relationship experiences, and it may also be a time during which temperament and relationship experiences are especially susceptible to change and mutual influence (Tackett, Herzhoff, Reardon, De Clercq, & Sharp, 2013). Moreover, the transition from childhood to adolescence is a period when many biological, social, and psychological changes are accompanied by temporary, self-regulatory dips in some aspects of personality maturity (DeFruyt et al., 2009; Klimstra et al., 2009; Soto & Tackett, 2015; Van den Akker et al., 2010; Van den Akker et al., 2014). As suggested by the *disruption hypothesis*, this period of temporary immaturity may have specific implications for the timing and rate of the normative developmental sequence that follows, as well as later outcomes in adolescence and adulthood. Findings from relational aggression research can broaden our understanding of personality development, which has primarily focused on positive aspects of development, such as maturation and adaptation. Many adolescents struggle with maturation and adaptation, some for brief periods and others for much of their lifetimes. Being a perpetrator or victim of relational aggression may be one interpersonal factor that contributes to the well-documented self-regulatory dip in adolescence, which causes a temporary disruption in the longterm normative progression toward personality maturity. Thus, identifying the bidirectional pathways between traits and relational aggression may not only help to identify unhealthy trait development that has cascading effects on outcomes throughout the rest of the life course, but may also help to pinpoint avenues for future research on individual- and peer-based bullying prevention efforts.

The Present Study

The present study used data from a large sample of Mexican-origin youth assessed from age 10 to 16 to address three central questions: (1) Does temperament have prospective effects (*selection/evocation*) on change over time in relational aggression (for both victims and perpetrators)? (2) Does relational aggression have prospective effects (*socialization*) on change over time in temperament? (3) Do the findings vary for boys and girls? We focus on three fundamental aspects of adolescent temperament: Effortful Control, Negative Emotionality, and Surgency. Although in many contexts the developmental pathways characterizing Mexican-origin and European-origin youth differ, in the present context we expect that the *selection/evocation* and *socialization* processes that contribute to the association between temperament and relational aggression are unlikely to be culture specific. In other words, youth from all ethnic groups are likely to possess temperamental traits that increase their risk for relational aggression, and, conversely, relational aggression is likely to influence the development of temperament for youth from different ethnic backgrounds.

Although a handful of studies have begun to examine the personality correlates of relational aggression, previous research has yet to examine the role of temperament as both an antecedent to *and* a consequence of relational aggression in fine-grained, longitudinal studies from late childhood through adolescence. Thus, the present study extends previous research in several ways. First, we examined developmental change from late childhood through adolescence, a time when relational aggression becomes most salient. Second, because both relational aggression and temperament were assessed repeatedly over time, we were able to examine reciprocal prospective relations between the two constructs, allowing us to identify temperamental tendencies that predict who becomes a victim or perpetrator (*selection* and *evocation*). Conversely, we were also able to investigate how being a victim or perpetrator relates to subsequent change in temperament (*socialization*). Third, in addition to studying broad temperament dimensions such as Effortful Control and Negative Emotionality, we were able to examine specific facets of each of these superordinate domains and how they are reciprocally associated to relational aggression. Finally, in contrast to previous studies, we were able to examine the effects for both victim *and* perpetrators of relational aggression.

Methods

Participants and Procedures

The data come from the California Families Project, a longitudinal study of Mexican-origin youth and their parents ($N=674$ families). Children were drawn at random from rosters of students in over 100 different schools in the Woodland- and Sacramento-area, CA. The focal child had to be in the 5th grade, of Mexican origin, and living with his or her biological mother. Participants were interviewed in their homes in Spanish or English, depending on their preference. The parents were not present when their child was interviewed. The first assessment occurred when the children (50% female) were in the 5th grade ($M_{age} = 10.8$ years; $SD = 0.60$).

The present study uses data from when the children were 10, 12, 14, and 16 years old. Retention rates (relative to the original sample) were 86% at age 12, 91% at age 14, and 90% at age 16. To investigate the potential impact of attrition, we compared individuals who did and did not participate in the age 16 assessment on study variables assessed at age 10. No significant differences were found in gender, temperament (Effortful Control, Negative Emotionality, Surgency), or relational aggression (victimization, perpetration), all p s > .10.

Measures

Relational aggression—The focal child completed a 9-item Relational Aggression scale adapted from Prinstein, Boergers, and Vernberg (2001); Neary and Joseph (1994); and Kokkinos and Panayiotou (2004). Participants completed two versions of the scale, one worded to assess whether the respondent was a victim of relational aggression and the other worded to assess whether the respondent was a perpetrator of relational aggression. Sample items include, “In the past three months, a kid your age told mean stories or lies about you.” [“In the past three months, you told mean stories or lies about a kid your age.”] and “In the past 3 months, a kid your age left you out of what he or she was doing.” [“In the past 3 months, you left a kid your age out of what you were doing on purpose.”]. Responses were made on a 4-point scale ranging from 1 (*almost never or never*) to 4 (*almost always or always*). We created latent factors to represent ‘Victim Relational Aggression’ and ‘Perpetrator Relational Aggression’ at ages 10, 12, 14 and 16. Each latent factor had three indicators, with each indicator comprised of a randomly selected parcel of three items.

Temperament—A short form of the *Early Adolescent Temperament Questionnaire—Revised* (EATQ-R; Ellis & Rothbart, 2001) was completed by the children and their mothers (who provided reports about their child) at ages 10, 12, 14, and 16. Ratings were made on a 4-point scale ranging from 1 (*not at all true of you/your child*) to 4 (*very true of you/your child*). The EATQ-R assessed three broad dimensions: Effortful Control, Negative Emotionality, and Surgency (e.g., Muris, Meesters, & Blijlevens, 2007).

Effortful control: This 16-item scale assesses the ability to anticipate and suppress inappropriate responses, as well as the ability to perform an action despite the inclination not to do so. Sample items include, “*It is easy for [you/your child] to really concentrate on homework problems*” and “*[You/your child] puts off working on projects until right before they are due.*” We computed a latent factor of “Effortful Control” using four indicators, which were computed by creating parcels of randomly selected items within rater and then averaging the same-item parcels across raters. In addition to the broad Effortful Control scale, we also computed three facet scales: ‘Activation Control’ (the capacity to perform an action when there is a strong tendency to avoid it), ‘Attention’ (the capacity to focus attention as well as to shift attention when desired), and ‘Inhibitory Control’ (the capacity to plan and to suppress inappropriate responses). Each facet scale had four indicators, based on parcels of randomly selected items within rater and then averaging the same-item parcels across raters.

Negative emotionality: This 13-item scale measures the propensity to experience negative emotions. Sample items include, “*You [Your child] feel scared when you enter a darkened*

room at home.” and “*It frustrates you [your child] if people interrupt you when you’re talking.*” The “Negative Emotionality” factor was defined by four indicators, based on parcels of randomly selected items within rater and then averaging the same-item parcels across raters. Negative Emotionality is comprised of two facets, ‘Fear’ (unpleasant affect related to anticipation of distress) and ‘Frustration’ (negative emotionality related to interruption of ongoing tasks or goal blocking). Each facet had four indicators, which were computed by creating parcels of randomly selected items within rater and then averaging the same-item parcels across raters.

Surgency: This 6-item scale assesses the tendency to seek out rewarding or sociable experiences. Because the scale had low reliability at age 10, we added 8 items at ages 12, 14, and 16; these additional items were taken from the Surgency scale on the long version of the EATQ-R. However, item analyses showed that four of the items reduced the overall reliability of the scale at all waves and for both child and mother reports. Therefore, we removed these 4 items, resulting in a 10-item scale. Sample items include, “*You [your child] prefer(s) friends who are exciting and unpredictable.*” and “*You [your child] like(s) exploring new places.*” The “Surgency” factor was defined by three indicators, based on parcels of randomly selected items within rater and then averaging the same-item parcels across raters. To account for missing items, two of the indicators at age 10 were specified as “phantom” indicators, which were constrained to have the same loadings as the respective indicators at subsequent waves.

Statistical Analyses

We conducted cross-lagged regression models to examine our research questions. All analyses were conducted using *Mplus* Version 6. We used a robust maximum likelihood estimator (MLR) to account for non-normal distributions of observed variables and full information maximum likelihood procedure (FIML) to account for missing data (Allison, 2003; Schafer & Graham, 2002). We used item parcels as indicators because they produce more reliable latent variables than individual items (Little, Cunningham, Shahar & Widaman, 2002). To compute more accurate fit indices for model comparisons with large samples, we assessed adequate model fit by change in comparative fit index (CFI) less than or equal to .01 and change in McDonald’s non-centrality index (NCI) less than or equal to .02 (Meade, Johnson, & Braddy, 2008; Cheung & Rensvold, 2002). We also note the values of the root-mean-square error of approximation (RMSEA), for which adequate fit is indicated by values less than or equal to .06 (Hu & Bentler, 1998; Hu & Bentler, 1999).

To evaluate measurement invariance, we compared two measurement models for each of the temperament and relational aggression constructs. In the first measurement model, we freely estimated the factor loadings for the latent factors at each age of assessment. The second measurement model constrains respective factor loadings to be the equal at each age of assessment. If the constrained model does not fit worse than the unconstrained model, then we can conclude that the latent constructs are measured similarly across time (i.e., factorial invariance).

Then, we assessed the structural relations among these factors. In cross-lagged models, the lagged paths indicate the effect of one variable on the other, after controlling for their concurrent relations and the stability of the variables over time. We accounted for variance due to measurement occasion by cross-sectionally correlating the corresponding factor variances. We tested the fit of three structural models: 1) a model that allowed all structural coefficients (stability paths and cross-lagged coefficients) to be freely estimated, 2) a model where the stability paths were constrained to be equal over time within each construct, and 3) a model where both the stability and cross-lagged paths were constrained to be equal over time *within* each construct. If the difference in fit indices between these specifications is not significant, then we favor the more parsimonious model and retain the structural constraints.

Results

Table 1 shows the means and standard deviations of the observed variables, as well as the omega reliabilities of the latent factors at each age of assessment. The concurrent correlations between victim and perpetrator behaviors were .56, .52, .63, and .60 at Waves 1, 3, 5, and 7 respectively, *all ps* < .05.¹ Tables 2 and 3 demonstrate the comparisons in model fit for the measurement and structural models, respectively. None of the constrained measurement and structural models fit significantly worse than the freely estimated models, so we retained the longitudinal constraints on factor loadings and the longitudinal constraints on the structural pathways for all subsequent analyses. Figure 1 shows a conceptual representation of the cross-lagged regression model being tested.

Stability of Temperament and Relational Aggression Over Time

Consistent with previous research, stability over time was high for all traits, ranging from .68 to .75 for Effortful Control, .64 to .69 for Negative Emotionality, and .54 to .66 for Surgency. Stability for the facets of Effortful Control and Negative Emotionality ranged from .69 to .82 for Activation Control, .70 to .81 for Attention, .85 to .88 for Inhibitory Control, .58 to .73 for Fear, .53 to .61 for Frustration. Relational Aggression was somewhat less stable (.36 to .54 for the Victim scale and .43 to .51 for the Perpetrator scale).

Prospective Effects of Temperament on Relational Aggression

Table 4 shows the standardized coefficients for the prospective effect of temperament on victimization and perpetration, controlling for prior levels of victimization and perpetration. Effortful Control was associated with decreases in both victimization and perpetration; the link with victimization was largely driven by the Attention facet, whereas the link with perpetration was driven by all three facets (Attention, Activation Control, Inhibitory Control).

Negative Emotionality was associated with increases in victimization, largely due to the Fear facet. Although the broad Negative Emotionality dimension was not significantly related to perpetration, the specific facet of Frustration predicted increases in perpetration. Finally,

¹We also conducted cross-lagged models to examine the longitudinal association between victimization and perpetration. We constrained the lagged pathways to be equal and found that perpetration predicted increases in victimization ($\beta = .11, p = .002$), but victimization did not predict change in perpetration ($\beta = -.03, p = .25$).

Surgency was not associated with either victimization or perpetration. In summary, youth high in Effortful Control and low in Negative Emotionality tended to show relative declines in relational aggression—both victimization and perpetration—across adolescence.

Prospective Effects of Relational Aggression on Temperament

Table 4 shows the standardized coefficients for the prospective effect of relational aggression on temperament, controlling for prior levels of temperament. Youth who were the victims of relational aggression tended to decrease in Effortful Control and increase in Negative Emotionality (especially Fear). Youth who perpetrated relational aggression tended to decline in the Activation Control component of Effortful Control and increase in Negative Emotionality (especially Frustration) and Surgency. Overall, then, both Effortful Control and Negative Emotionality (or one of their facets) had reciprocal prospective relations with victimization and perpetration. In contrast, we found evidence that relational aggression (specifically perpetration) can lead to Surgency, but no evidence that Surgency leads to relational aggression.

Finally, to test whether gender moderates any of the effects, we conducted multiple-group analyses with equality constraints on the cross-lagged paths, separately for all possible models (i.e., all temperament dimensions/facets with both victimization and perpetration). In all cases, models with gender constraints did not fit significantly worse than freely estimated models (all chi-square difference tests non-significant), suggesting that the prospective associations between temperament and relational aggression do not vary by gender.²

Discussion

The present study examined cross-lagged reciprocal relations between relational aggression and mother- and child-reported temperament, using data from a longitudinal study of 674 Mexican-origin youth assessed at ages 10, 12, 14, and 16. Results show that: (a) high Negative Emotionality and low Effortful Control predicted increases in victimization; (b) low Effortful Control predicted increases in perpetration; (c) victims of relational aggression increased in Negative Emotionality and decreased in Effortful Control; and (d) perpetrators of relational aggression increased in Negative Emotionality and Surgency. Thus, temperament serves as both a risk and protective factor for relational aggression, which, in turn, influences the development of temperament from late childhood to adolescence, a time when the peer relationships and the need for peer acceptance become increasingly salient. Evidence for bidirectional pathways – that is, temperamental traits are an antecedent to *and* a consequence of relational aggression – points to person-environment transactions that unfold over time: Relational aggression processes and outcomes are best seen as emerging out of an ongoing transaction between individual differences and the interpersonal environment. Below we discuss the findings in more detail and describe the implications for future work on individual- and peer-based interventions.

²We also conducted multiple group analyses with nativity status (born in Mexico vs. the United States). Models with constraints across nativity groups did not fit significantly worse than the freely estimated models, which suggests that there are no differences in the longitudinal associations between temperament and relational aggression for youth born in Mexico vs. the U.S.

Selection/Evocation Processes: Temperament Leads to Changes in Bullying and Victimization

Consistent with prior research showing that the correlates of perpetration and victimization are often similar, we found that youth with poor self-control increased in both perpetration and victimization over time. It is possible that youth who are less regulated *select* into the role of a bully because it allows them to express their temperamental tendencies by lashing out or aggressing against other children. Similarly, youth who are less regulated (and more specifically, have poorer attentional skills) are also more likely to experience victimization throughout adolescence, which demonstrates an *evocative* pathway through which temperament affects relational aggression. This suggests that youth who have lower self-control may potentially signal vulnerability and elicit victimization from peers because they are generally less attentive to social cues or interpersonal relationships.

Second, our findings demonstrated that youth prone to Negative Emotionality (specifically, for fearful tendencies) experienced more victimization over time, which is consistent with previous work on fearful and anxious tendencies (Hodges, Malone, & Perry, 1997; Hodges & Perry, 1999). It is possible that youth who are more fearful and withdrawn are more likely to be targeted, presumably because they are viewed as vulnerable or weak, which *evokes* an adverse interpersonal response from peers. Youth prone to Negative Emotionality (specifically Frustration) were more likely to increase in perpetrating relational aggression, perhaps because youth who get frustrated easily are more likely to take out their frustration by aggressing against other children.

Last, we did not find any prospective effects of Surgency on perpetration. That is, youth inclined to seek out rewarding experiences are not more likely to engage in bullying than youth who are less sensitive to rewarding experiences, which provides evidence against the idea that children seek out bullying opportunities because it is a way to express their sensation-seeking tendencies. Similarly, Surgency was not related to changes in victimization, suggesting that reward-oriented youth are neither more nor less likely to elicit relational aggression from their peers. However, this is contrary to previous research suggesting that higher levels of Surgency-related traits (e.g., activity and sociability) are related to *more* relational aggression, whereas higher levels of shyness are associated with *less* relational aggression (Russell, Hart, Robinson, & Olsen, 2003). Future research should attempt to replicate all of these *selection/evocation* pathways, and also extend the findings by directly testing the mediating *mechanisms* through which Negative Emotionality and Effortful Control lead to increases in relational aggression during the transition to adolescence.

If adolescents possess temperamental tendencies that lead them to *select* into becoming a perpetrator of relational aggression, or *evoke* certain responses from their peers, which leads them to become victimized, then these self-regulatory traits should be considered when developing interventions to prevent or reduce bullying. Recent research has examined the effectiveness of school-based efforts toward reducing physical and relational aggression (Leff, Waasdorp, & Crick, 2010); however, none of these prevention/intervention tactics have considered the individual difference factors that lead youth to be better or worse at learning or using social information processing and other social-cognitive strategies to

prevent bullying. It is possible that therapeutic (De Fruyt, Van Leeuwen, Bagby, Rolland, & Rouillon, 2006) and experimental (Jackson, Hill, Payne, Roberts, & Stine-Morrow, 2012) interventions known to change temperamental traits are likely to reduce risk of increases in both bullying and victimization for teens.

Socialization Processes: Bullying and Victimization Leads to Subsequent Changes in Temperament

In addition to certain temperamental tendencies leading to victimization and perpetration, the experience of relational aggression, on either side of the interpersonal transaction, can *socialize* or reinforce adolescent temperament in maladaptive ways. Youth who are victimized by their peers are more likely to *decrease* in Effortful Control, which demonstrates how being the target of relational aggression may adversely affect the normative development of self-regulatory skills. It is possible that these unrelenting victimization experiences wear on the adolescent's ability to contain or regulate their behavior, which then elicits even more aggressive tendencies from peers. On the other hand, and contrary to what we would expect, bullies did not experience any changes in self-regulation over time. It is possible that youth who exercise their aggressive tendencies are already very under-controlled by late childhood, and do not experience any further decrements in self-control as a result of their ongoing bullying.

Common to both sides of this maladaptive interpersonal experience, youth who were bullies or victims of relational aggression were more likely to *increase* in Negative Emotionality from age 10 to 16. Continually engaging in bullying behavior may actually induce higher levels of negative affect or irritation, due to the toxic nature of ongoing negative interactions with peers. More specifically for bullies, aggressing against other children *socializes* them to be even more frustrated. On the other hand, given the importance of peer acceptance during late childhood and adolescence, the experience of being ostracized and excluded by one's peers seems likely to generate a great deal of negative affect and, more precisely, the degree to which they feel fearful. Given the traumatic nature of being victimized by peers, it is not surprising that these children become more fearful and anxious as they endure the already difficult transition into adolescence.

Finally, although Surgency did not predict increases in perpetration, perpetrators tended to increase in Surgency. It is possible that engaging in bullying is pleasurable for the perpetrator and is rewarded by increased status and admiration from peers, which then boosts the motivation to seek out pleasurable, rewarding experiences more generally. Future research should empirically investigate the processes that explain *how* and *why* maladaptive interpersonal transactions work to reinforce or shape temperamental tendencies later in development, and how these changes subsequently affect other externalizing behavior such as delinquency, substance use, and school dropout in adolescence.

Theoretically, these *socialization* processes suggest that temporary shifts in maturity in adolescence may be due in part to maladaptive, interpersonal experiences, which lends further support for the *disruption hypothesis*. Repeated acts of aggression, recurrent negative emotional states, and other aversive experiences that chronically occur in maladaptive interpersonal transactions may create an environmental press for both perpetrators and

victims. In other words, if being a perpetrator or a victim of relational aggression leads to less desirable trait changes, then this may not only contribute to a more severe, self-regulatory dip in adolescence, but it may also set youth on a lifelong trajectory of maladaptive behavior.

More practically, if these hurtful, interpersonal experiences *reinforce* or *socialize* adolescent temperamental tendencies in maladaptive ways, then this can have subsequent consequences of its own, which provides even more support for using individual difference factors as targets for efforts to reduce bullying. Taken together, we may not only be able to identify which children are at risk for becoming victims or bullies, but we may also be able to intervene in how these adverse interpersonal experiences subsequently shape adolescent traits. In other words, interventions aimed at changing personality can break the cycle that leads to both bullying and being bullied, and subsequent problematic behavior that may arise as a consequence of these interpersonal behaviors. We know very little about whether relational aggression itself leads to more internalizing and externalizing behaviors, and poorer academic performance, or whether these associations are a byproduct of relational aggression shaping temperamental tendencies, which then leads to these maladaptive outcomes. Moreover, it is possible that temperament and psychopathological symptoms develop in tandem, making it difficult to tease apart their respective influences on relational aggression; however, we have good reasons to expect associations reported in the present research to be robust to potential measurement confounding (Lemery, Essex, & Smider, 2002). Future research should aim to parse apart the temperamental and psychopathological pathways that lead to and result from relational aggression. Furthermore, researchers should consider targeting temperamental traits for prevention and intervention efforts because they are *both* an antecedent to and a consequence of bullying in late childhood and adolescence (McClowry & Collins, 2012).

Limitations

The current investigation has several limitations that merit attention. First, as in most prior studies, relational aggression (perpetration and victimization) was assessed by self-reports. Although some perpetrators may deny engaging in bullying, and some victims may be ashamed to acknowledge being bullied, the youth in the present study have been involved in the project for many years and have demonstrated a willingness to acknowledge behaviors that are even more problematic than relational aggression, including depression, drug use, theft, risky sexual behavior, etc. Nonetheless, relational aggression is a dyadic transaction, and future research should aim to incorporate the perspective of both sides of the same interaction.

Second, all of the relational aggression items in the current study were “proactive” in nature. Increasing attention has been given to distinguishing between different forms of relational aggression, such as proactive vs. reactive, to better understand the functions and correlates of these different subtypes of aggression (Card & Little, 2006; Murray-Close et al., 2010). It is possible that these selection and socialization processes play out differently if we were to consider reactive forms of relational aggression. For example, if youth are *reactively* perpetrating against others, in response to perceived threat or out of anger, this may lead to

changes in Frustration or Negative Emotionality, that are otherwise absent if youth are *proactively* perpetrating against others.

Third, although the present study is among the first to examine reciprocal relations between relational aggression and personality development, we were not able to examine the mediating mechanisms through which, or the conditions under which, these *selection*, *evocation*, and *socialization* effects occur. Although recent studies have begun to examine the conditions under which relational aggression is associated with individual differences (Gower & Crick, 2011; Mayeux, 2014; Smack, Kushner, & Tackett, 2015), we know little about *why* relational aggression and individual differences are associated throughout late childhood and adolescence, and whether the same associations persist later in adolescence and early adulthood.

Fourth, although the present study is the first to examine the association between relational aggression and temperament in a Mexican-origin sample, it is important to replicate the present findings in other ethnic groups to establish the generalizability of the findings. Additionally, although we do not expect the basic association between temperament and relational aggression to vary across ethnic groups, it is possible that youth are being relationally aggressed against because of their Mexican heritage. We expect that when relational aggression is rooted in ethnic discrimination, it may have even more deleterious effects on the developing youth.

Fifth, it is possible that the observed associations between personality and relational aggression are due to a *common cause* or *shared etiology*, that is, they are associated because the same factors lead to changes in both personality and relational aggression. Finally, the reciprocal effects between relational aggression and personality were relatively small, which is not surprising given that both relational aggression and personality are determined by a vast array of influences, ranging from genetic to socio-cultural factors. Moreover, even small effects can have larger longterm effects, as the cumulative impact of a lifetime of relationship experiences might be quite powerful. If having these maladaptive interpersonal experiences for several years produces modest decreases in socially desirable traits, then having these experiences repeatedly for decades might produce substantial changes in this trait. We know very little about how long relational aggression persists into adulthood, whether it is in the college setting, the workplace, or within other relationships. Thus, future research should extend the current research to examine the co-development of personality and relational aggression into adulthood.

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Highlights

- High Negative Emotionality and low Effortful Control predicted increases in victimization
- Low Effortful Control predicted increases in perpetration
- Victims increased in Negative Emotionality and decreased in Effortful Control
- Perpetrators increased in Negative Emotionality and Surgency

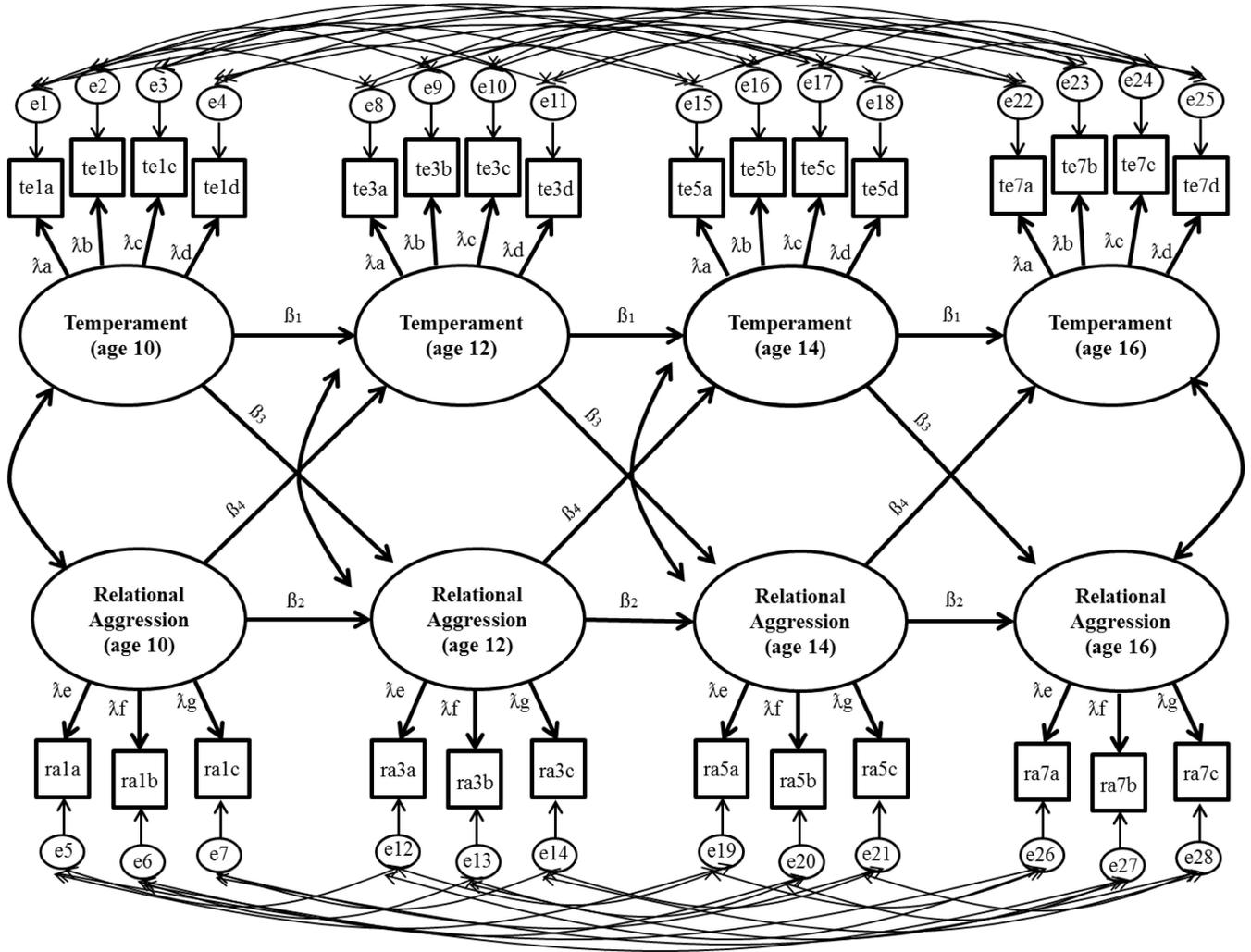


Figure 1. Conceptual representation of cross-lagged regression model for temperament and relational aggression.

Table 1

Means, Standard Deviations, and Omega Reliabilities of Measures

	<u>5th grade (age 10)</u>		<u>7th grade (age 12)</u>		<u>9th grade (age 14)</u>		<u>11th grade (age 16)</u>					
	M	SD	ω	M	SD	ω	M	SD	ω			
Effortful Control	2.96	.34	.82	2.94	.32	.85	2.87	.32	.87	2.87	.29	.75
Negative Emotionality	2.61	.38	.79	2.35	.37	.80	2.20	.37	.80	2.14	.37	.76
Surgency	2.59	.50	--	2.52	.49	.76	2.57	.45	.77	2.53	.45	.78
Victim Relational Aggression	1.42	.51	.89	1.15	.26	.85	1.12	.23	.86	1.10	.20	.82
Perpetrator Relational Aggression	1.17	.28	.79	1.09	.19	.86	1.09	.19	.84	1.07	.16	.77

Note. Means and standard deviations are descriptive information from observed variables. ω = omega coefficients (an estimate of reliability) of the latent factors. There is only one indicator (and two phantom indicators) loading onto the Surgency factor at age 10, which does not allow us to compute an omega coefficient.

Table 2

Fit Indices of Measurement Models

	CFI (Δ CFI)	NCI	RMSEA	90% CI of RMSEA
Effortful Control	1.00 (.001)	.004	.014	.000 – .026
<i>Activation Control</i>	.89 (.002)	.003	.074	.067 – .081
<i>Attention</i>	.87 (.002)	.003	.078	.070 – .085
<i>Inhibitory Control</i>	.96 (.000)	.000	.034	.025 – .043
Negative Emotionality	.99 (.003)	.010	.021	.006 – .031
<i>Fear</i>	.82 (.012)	.018	.096	.089 – .103
<i>Frustration</i>	.81 (.001)	.000	.118	.111 – .125
Surgency (age 12 to 16)	.99 (.000)	.000	.043	.025 – .061
Victim Relational Aggression	.99 (.008)	.022	.041	.028 – .054
Perpetrator Relational Aggression	.97 (.012)	.023	.056	.044 – .068

Note. For all models we retained the longitudinal constraints on loadings (factorial invariance). Values in the table indicate the fit indices for the model with constraints. Values in parentheses indicate the change in CFI from the model with freely estimated loadings to the model with longitudinal constraints. For Surgency, we were only able to test for measurement invariance at ages 12, 14 and 16 because of the specification of phantom indicators on the latent factor at age 10. NCI = McDonald's non-centrality index; CFI = comparative fit index; RMSEA = root-mean-square error of approximation; CI = confidence interval.

Table 3

Fit Indices of Structural Models

	CFI (Δ CFI)	NCI	RMSEA	90% CI of RMSEA
Victim Relational Aggression				
Effortful Control	.99 (.001)	.001	.022	.016 – .027
<i>Activation Control</i>	.93 (.000)	.000	.046	.042 – .050
<i>Attention</i>	.92 (.001)	.003	.049	.045 – .053
<i>Inhibitory Control</i>	.96 (.002)	.009	.030	.026 – .035
Negative Emotionality	.98 (.002)	.007	.028	.023 – .033
<i>Fear</i>	.91 (.003)	.007	.054	.050 – .058
<i>Frustration</i>	.88 (.001)	.002	.066	.062 – .070
Surgency	.98 (.001)	.004	.034	.028 – .040
Perpetrator Relational Aggression				
Effortful Control	.97 (.000)	.000	.033	.028 – .037
<i>Activation Control</i>	.90 (.000)	.000	.051	.047 – .055
<i>Attention</i>	.90 (.000)	.001	.051	.047 – .055
<i>Inhibitory Control</i>	.94 (.002)	.005	.035	.031 – .040
Negative Emotionality	.97 (.000)	.000	.034	.030 – .039
<i>Fear</i>	.88 (.000)	.001	.056	.052 – .060
<i>Frustration</i>	.87 (.000)	.001	.066	.063 – .070
Surgency	.95 (.000)	.001	.043	.037 – .049

Note. For all models we retained the longitudinal constraints for the respective structural paths. Values in the table indicate the fit indices for the model with constraints. Values in parentheses indicate the change in CFI from the model with freely estimated structural paths to the model with longitudinal constraints. NCI = McDonald's non-centrality index; CFI = comparative fit index; RMSEA = root-mean-square error of approximation; CI = confidence interval.

Table 4

Structural Coefficients for Cross-Lagged Regression Models

	EATQ →RA-V	EATQ →RA-P	RA-V → EATQ	RA-P →EATQ
<i>Effortful Control</i>				
Age 10 to 12	<i>-.04 (.02)</i>	-.06 (.02)	<i>-.06 (.03)</i>	-.03 (.03)
Age 12 to 14	<i>-.05 (.03)</i>	-.08 (.03)	<i>-.03 (.02)</i>	-.03 (.02)
Age 14 to 16	<i>-.06 (.03)</i>	-.09 (.03)	<i>-.03 (.01)</i>	-.03 (.02)
<i>Activation Control</i>				
Age 10 to 12	-.04 (.02)	-.05 (.02)	-.06 (.03)	-.05 (.02)
Age 12 to 14	-.06 (.03)	-.07 (.02)	-.03 (.02)	-.05 (.02)
Age 14 to 16	-.07 (.03)	-.09 (.04)	-.03 (.02)	-.04 (.02)
<i>Attention</i>				
Age 10 to 12	-.10 (.03)	-.09 (.03)	-.04 (.04)	-.01 (.04)
Age 12 to 14	-.14 (.03)	-.12 (.03)	-.02 (.02)	-.01 (.03)
Age 14 to 16	-.18 (.04)	-.16 (.04)	-.02 (.02)	-.00 (.03)
<i>Inhibitory Control</i>				
Age 10 to 12	-.00 (.03)	-.07 (.03)	.01 (.04)	-.01 (.04)
Age 12 to 14	-.00 (.04)	-.08 (.04)	.01 (.02)	-.01 (.04)
Age 14 to 16	-.00 (.04)	-.11 (.05)	.00 (.02)	-.01 (.03)
<i>Negative Emotionality</i>				
Age 10 to 12	<i>.04 (.02)</i>	.03 (.02)	.07 (.03)	.06 (.03)
Age 12 to 14	<i>.06 (.03)</i>	.03 (.03)	.04 (.02)	.05 (.02)
Age 14 to 16	<i>.07 (.03)</i>	.04 (.03)	.03 (.02)	.05 (.02)
<i>Fear</i>				
Age 10 to 12	.08 (.02)	.02 (.02)	<i>.08 (.04)</i>	.05 (.03)
Age 12 to 14	.11 (.03)	.02 (.03)	<i>.04 (.02)</i>	.04 (.03)
Age 14 to 16	.12 (.04)	.02 (.04)	<i>.04 (.02)</i>	.04 (.03)
<i>Frustration</i>				
Age 10 to 12	.02 (.02)	.05 (.02)	.06 (.04)	.12 (.03)
Age 12 to 14	.03 (.03)	.05 (.03)	.03 (.02)	.09 (.03)
Age 14 to 16	.04 (.04)	.07 (.04)	.03 (.02)	.09 (.02)
<i>Surgency</i>				
Age 10 to 12	-.00 (.02)	.01 (.02)	.05 (.04)	.09 (.03)
Age 12 to 14	-.00 (.03)	.02 (.03)	.03 (.02)	.07 (.03)
Age 14 to 16	-.00 (.04)	.03 (.04)	.02 (.02)	.06 (.02)

Note. EATQ = Early Adolescent Temperament Questionnaire; RA-V = Victim Relational Aggression; RA-P = Perpetrator Relational Aggression. Values in the table are standardized regression coefficients. Values in parentheses are their standard errors. **Bolded** values indicate results where $p < .03$. Values in **bold** and *italics* are $p = .03-.05$. All other values are greater than .05.