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The Co-Development of Relational Aggression and Disruptive Behavior Symptoms from Late Childhood through Adolescence

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Abstract

Researchers have debated whether relational aggression is a developmentally-normative behavior or a sign of some underlying psychopathology. However, due to the dearth of longitudinal studies, we know little about how relational aggression and more severe forms of disruptive behavior co-develop. The present study examined bidirectional associations between relational aggression and two psychiatric disorders, Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD), using data from a longitudinal study of 674 Mexican-origin youth followed from age 10 to 16. Results showed that individuals who engaged in relational aggression tended to increase over time in ODD and CD symptoms, and conversely, individuals exhibiting symptoms of ODD and CD tended to increase in relational aggression. These findings held for boys and girls, for youth born in Mexico and the U.S., and after controlling for physical aggression. Thus, relational aggression seems to be *both* a developmentally-normative behavior *and* a predictor of future mental health problems.

Keywords

relational aggression; ODD; CD; longitudinal

Relational aggression refers to behaviors intended to harm others through the use of exclusion or intentional manipulation in the context of peer relationships, often to disparage a peer's social status (Crick & Grotpeter, 1995). Relationally aggressive behaviors include spreading rumors or telling lies about a peer or purposely ostracizing peers from activities or social groups. Although relationally aggressive behaviors are often indirect and subtle in nature, they can also be direct such as making fun of the way a peer looks or "name calling". Relational aggression can have harmful consequences for the perpetrator as well as the victim, including poorer friendship quality, academic failure, suicidal ideation, and delinquency (Card et al., 2008; Crick, Ostrov, & Werner, 2006; Espelage & Holt, 2013; Tackett & Ostrov, 2010). A current debate concerns whether relational aggression should be considered *typical* or *atypical* behavior (Voulgaridou & Kokkinos, 2015). Some researchers consider relational aggression a normative, and sometimes adaptive, response to new developmental milestones (e.g. Tackett et al., 2014), while others believe that relational

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aggression is a mental health concern that should be included in the DSM (Keenan, Coyne, & Lahey, 2008).

Is Relational Aggression Developmentally Normative?

Recent studies support the claim that relational aggression is a normative behavior because the developmental challenges youth experience during adolescence promote and facilitate relationally aggressive behavior (e.g., Crick et al., 2007; Tackett et al., 2014; Zimmer-Gembeck et al., 2014). These challenges include increasingly intimate social relationships (Yoon, Barton & Taiariol, 2004), a heightened need to be accepted by peers and attempts to gain status (Moretti, Holland & McKay, 2001), and increasingly complex cognitive, emotional, and social skills (Prinstein, Boergers & Vernberg 2001). Moreover, physical forms of aggression are less accepted by adults and peers, which may lead adolescents to use more subtle forms of aggression to achieve their goals (Card et al., 2008). Taken together, these developmental milestones underscore how increasingly sophisticated peer relations become during the transition into adolescence, and how relational aggression may be one way in which adolescents adapt to their complex new social environment.

Is Relational Aggression Indicative of Mental Health Problems?

As a counterpoint to research and theory suggesting that some degree of relational aggression is normative during the transition from late childhood to adolescence, several studies suggest that relational aggression may be a manifestation of more serious externalizing problems and should be included as atypical symptoms in the DSM (Keenan, Coyne, & Lahey, 2008; Voulgaridou & Kokkinos, 2015). Consistent with this position, elevated rates of relational aggression are associated with increased levels of Attention-Deficit/Hyperactivity Disorder (ADHD), Oppositional Defiant Disorder (ODD), and Conduct Disorder (CD; Prinstein, Boergers & Vernberg, 2001; Zalecki & Hinshaw, 2004). ODD and CD are of particular interest due to their increasing prevalence in late childhood and early adolescence, when relationally aggressive behaviors typically first emerge (Murray-Close et al., 2016). ODD symptoms include defiant, disobedient, and hostile behaviors directed toward adults or authority figures. CD symptoms include behaviors that violate a person's rights or disregard age-specific social rules and norms, and include physically aggressing against other people, destroying property, and stealing. Although relational aggression, ODD, and CD all encompass some form of other-directed aggression, relational aggression involves a distinct subset of other-directed aggressive behaviors that occur exclusively in a peer context with the specific goal of reducing others', or increasing one's own, social status. More specifically, youth with ODD often direct their hostile and defiant behaviors towards adults or authority figures (rather than peers), and youth with CD primarily engage in physical (rather than relational) aggression.

Bidirectional Transactions among Relational Aggression and ODD and CD Symptoms

Relational aggression is moderately correlated with ODD and CD symptoms (Keenan et al., 2008; Prinstein et al., 2001). However, concurrent associations provide little insight into

whether relational aggression is a precursor or consequence of ODD and CD symptoms, or whether all three behavioral problems develop from a common underlying cause. Longitudinal research is needed to examine bidirectional influences between these constructs over time.

The present study used data from a longitudinal study of Mexican-origin youth, in which relational aggression and ODD/CD symptoms were assessed from age 10 to 16. If relational aggression is solely a developmentally-normative behavior, with no clinical implications, we would not expect to find bidirectional, longitudinal influences between relational aggression and ODD/CD. In other words, relational aggression and ODD/CD would each develop separately over time, as a response to certain adolescent "milestones", but they would not predict changes in each other. In contrast, if relational aggression is indicative of mental health problems, we would expect relational aggression to have a prospective influence on change over time in ODD/CD symptoms (i.e., *precursor model*). Likewise, ODD/CD symptoms would predict change over time in relational aggression (i.e., *scar model*).

Furthermore, it is possible that the bidirectional associations between relational aggression and ODD/CD vary as a function of socio-demographic characteristics such as the child's gender or generational status. Relationally aggressive behaviors were initially thought to be displayed mainly by girls, but current research suggests that both sexes frequently engage in relational aggression (Archer & Coyne, 2005; Tackett & Ostrov, 2010). In contrast, disruptive behavioral disorders are frequently found to be more prevalent among boys (Berkout, Young, & Gross, 2011; Chaplin, Cole, & Zahn-Waxler, 2005), even though girls are often understudied and under-identified when it comes to externalizing symptomatology (Fontaine et al., 2009). One possibility is that girls manifest externalizing disorders via relationally aggressive behaviors whereas boys display externalizing disorders via conduct problems (Keenan et al., 2008), but there is little longitudinal research that addresses how the link between relational aggression and externalizing problems varies by gender.

Given that we are investigating these processes in an ethnic minority population, it is important to examine whether cultural factors influence the co-development of relational aggression and ODD/CD symptoms. The *Immigrant Paradox* suggests that first-generation and later-generation youth may follow distinct developmental pathways, with more acculturated (i.e., later-generation) individuals experiencing *more* behavioral and mental health problems (Garcia-Coll & Marks, 2011). Specific to relational aggression, it is possible that *first-generation*, Mexican-origin youth, who engender more of their heritage cultural values (e.g., interdependent and collectivistic beliefs), will display *fewer* relationally aggressive behaviors because they place more importance on relational connectedness and harmony (Buhs, McGinley, & Toland, 2010). Combined with the idea that first-generation youth are also at decreased risk of mental health problems, compared to later-generation youth, we hypothesize that the reciprocal pathways between relational aggression and externalizing problems may differ depending on generational status, which can serve as a proxy for level of acculturation.

The Present Study

The current study extends previous research in several ways. First, although several studies have examined association between relational aggression and externalizing problems, to our knowledge, no studies have investigated how these constructs mutually influence each other over time. Longitudinal data can provide increase understanding of the factors that contribute to changes in relational aggression and externalizing symptoms from late childhood to adolescence, a time when these behaviors become especially pronounced. Second, there is ongoing debate about whether relational aggression is developmentally-normative or indicative of mental health problems. By examining the influence of relational aggression on changes in externalizing symptoms (and vice versa), we can parse apart whether relational aggression is a precursor to, or a result of, externalizing symptoms. Third, there is also debate about whether relational aggression is exhibited primarily by girls. Given that ODD and CD symptoms are more typically experienced by boys, examining how the reciprocal relations between relational aggression and ODD/CD vary by gender is a critical issue. Finally, although minority youth are at a higher risk for mental health problems in comparison to other ethnic groups, we know little about the developmental processes that lead to externalizing disorders among Mexican-origin youth.

Method

Participants and Procedure

Data come from the California Families Project, a longitudinal study of 674 Mexican-origin youth and their parents. To be included in the study, the child had to be of Mexican origin, in the 5th grade, and living with his or her biological mother. Both children and parents were interviewed in their homes in Spanish or English (depending on their preference). 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 current study uses data from when the children were 10, 12, 14, and 16 years old. Retention rates (relative to the original sample of 674), were 86% at age 12, 91% at age 14, and 90% at age 16. To test for selective attrition, we compared participants who did and did not participate at age 16 on variables measured at age 10. No significant differences were found in gender, generational status, relational aggression, ODD symptoms, or CD symptoms (all *p*s>.10).

Measures

Relational aggression—The child completed a 9-item scale that assessed whether he/she had relationally aggressed against his/her peers during the previous three months (items adapted from Kokkinos & Panayiotou, 2004; Neary & Joseph, 1994; Prinstein, Boergers, & Vernberg, 2001). Appendix S1 lists all the items, which closely resemble the item content found on Crick & Grotpeter's (1995) widely-used measure of relational aggression. Sample items include, "*You told mean stories or lies about a kid your age*." and "*You left a kid your age out of what you were doing on purpose."* Responses ranged from 1 (*almost never or never*) to 4 (*almost always or always*). We created latent factors to represent 'relational aggression' at ages 10, 12, 14, and 16 (average ω=.82). Each latent factor had three indicators, with each indicator comprised of a randomly selected parcel of three items.

Externalizing symptoms—ODD and CD symptoms were assessed via the Diagnostic Interview Schedule for Children-IV, a comprehensive, DSM-IV based psychiatric interview designed for children and adolescents (Shaffer et al., 2000). Responses were recorded dichotomously, indicating the presence ("1") or absence ("0") of each symptom during the previous year. Recent research suggests that ODD includes symptoms related to two conceptually distinct facets: emotion dysregulation (irritability) and defiance (oppositionality) (Herzhoff & Tackett, 2016; Rowe et al., 2010; Stringaris & Goodman, 2009). Therefore, we examine overall ODD symptoms (12 items), as well as emotion dysregulation (4 items – "*[Did you] lose your temper*?") and defiance (8 items – "*[Did you] do things on purpose that caretakers said not to do?*") symptoms separately. CD was measured using 27 items (e.g., *"[Did you] break/damage someone else's things on purpose?"*). ODD and CD symptom counts were computed at ages 10, 12, 14, and 16. Concurrent associations between ODD and CD ranged from .37 to .44 across ages.

Generational status—Participants were categorized as 1st generation if their birth country was Mexico (29%); as 2nd generation if their birth country was the U.S., and only one of their parents was born in the U.S. (62%); and as 3rd generation if their birth country and both parents were born in the U.S. (9%). Because of the low percentage of 3rd generation youth, we created a dichotomous variable comparing 1st to 2nd + generation youth.

Statistical Analyses

To address our research questions, we conducted cross-lagged regression models using Mplus Version 6. We used full information maximum likelihood (FIML) to account for missing data and a robust maximum likelihood estimator (MLR) to account for non-normal distributions of observed variables. In all models, relational aggression was a latent variable and ODD and CD symptom counts were observed variables. We assessed adequate model fit by change in comparative fit index (ΔCFI) less than or equal to .01, change in McDonald's non-centrality index (ΔNCI) less than or equal to .02 (Meade, Johnson, & Braddy, 2008; Cheung & Rensvold, 2002), CFI values equal to or greater than .95, and RMSEA values smaller than .06 (Hu & Bentler, 1999).

To evaluate measurement invariance for relational aggression, we compared three measurement models: (1) freely estimating the factor loadings for the latent factors at each assessment (i.e., configural invariance); (2) constraining the factor loadings to be equal across assessments (i.e., weak invariance); and (3) constraining the factor loadings and intercepts to be equal across assessments (i.e., strong invariance). If the difference in fit between the more vs. less constrained models is not significant, then relational aggression is measured similarly across time (i.e., measurement invariance).

After establishing measurement invariance, we can assess the structural relations. In cross-lagged models, the lagged paths indicate the prospective effect of one variable on the other, after controlling for their concurrent relations and their stability over time, as well as competing reciprocal influences. We tested the fit of three structural models: (1) a model in which all structural coefficients (cross-lagged and stability paths) are freely estimated; (2) a

model where the respective stability paths were constrained to be equal over time; and (3) a model where both the respective cross-lagged and stability paths were constrained to be equal over time. If the difference in fit between these models is not significant, then we choose the more parsimonious model and retain the structural constraints.

We conducted multi-group analyses to test for differences between boys and girls, and 1st vs. 2nd generation youth. First, we tested measurement invariance across groups by comparing configural, weak, and strong invariance models for relational aggression. After confirming that relational aggression was assessed similarly across groups, we tested whether the cross-lagged paths vary by group. Specifically, we compared the fit of a model in which the lagged pathways were allowed to differ across groups, with the fit of a model in which the lagged pathways were constrained to be the same. If the constrained model does not fit significantly worse than the less constrained model, we can conclude that the structural parameters are similar for boys and girls and 1st vs 2nd+ generation youth.

Results

Table S1 (supplemental material) shows descriptive statistics for relational aggression, ODD, and CD at each age. Tests of measurement invariance provided support for strong invariance (see Table S2), indicating that relational aggression was assessed similarly across assessments. Tests of the structural parameters showed that constraining the stability and lagged pathways to be equal across assessments did not significantly reduce fit relative to the freely estimated model (see Table S2). Thus, we report results from models in which the stabilities and cross-lagged effects were constrained to be equal across the different age intervals (10–12, 12–14, and 14–16).

Figures 1 and 2 show the cross-lagged models for relational aggression with ODD and CD, respectively. The stability coefficients were moderate in magnitude, ranging from .40 to 47 for relational aggression, .32 to .44 for ODD symptoms, and .26 to .32 for CD symptoms. Concurrent associations ranged from .25 to .40 for relational aggression and ODD, and from .20 to .40 for relational aggression and CD.

Relational Aggression Predicts Changes in ODD and CD Symptoms

As shown in Figures 1 and 2, higher levels of relation aggression lead to increases over time in ODD and CD, even after controlling for prior levels of both variables, their concurrent associations, and the reciprocal, lagged pathway (i.e., the effect of ODD or CD on subsequent relational aggression). The prospective effects of relational aggression on ODD symptoms ranged in magnitude from .09 to .11 (95% CIs range=.04–.17), with significant effects for both facets, but slightly stronger effects for defiance (βs=.10–.13) in comparison to emotion dysregulation (βs=.08–.10). The prospective effects of relational aggression on CD symptoms ranged in magnitude from .09 to .20 (95% CIs range=.06–.27).

ODD and CD Symptoms Predict Change in Relational Aggression

As shown in Figures 1 and 2, higher levels of ODD and CD symptoms lead to increases over time in relational aggression. The prospective effects of ODD symptoms on relational aggression ranged in magnitude from .09 to .15 (95% CIs range=.05–.21), with significant

effects for both facets, but stronger effects for defiance (βs=.11–.17) than emotion dysregulation (βs=.05–.08). The prospective effects of CD symptoms on relational aggression ranged from .04 to .09 (95% CIs range=.01–.17).

We conducted two follow-up analyses to test the robustness of the cross-lagged effects. First, there were two items that captured "relationally aggressive" behaviors on the ODD and CD symptom scales (i.e., *"Have you gotten even with people by messing up their things/hurting them/telling lies about them?"* and *"Have you ever bullied someone smaller who wouldn't fight back?"*, respectively*).* We removed these items from the ODD/CD symptom counts, and all cross-lagged effects remained significant. Second, we entered physical aggression (a composite of: *"You pushed a kid your age around, or hit him/her"* and *"You broke or destroyed things belonging to a kid your age."*) as a covariate in the model, and all cross-lagged associations between relational aggression and ODD/CD remained the same, except the effect of CD symptoms on relational aggression became marginally significant (see Figures S1–S2). Taken together, these follow-up analyses suggest that the associations between relational aggression and ODD and CD symptoms are independent of: 1) overlapping relationally aggressive behaviors on the ODD/CD symptom scales, and 2) physical aggression, which also provides support for the discriminant validity of our relational aggression construct.

Reciprocal Associations Do Not Vary by Gender or Generational Status

Tests of measurement invariance showed that the weak invariance model was the best fit for both gender and generational status. With regard to the structural parameters, models constraining these parameters to be the same across groups did not fit significantly worse than models allowing the parameters to vary across groups. Thus, the reciprocal associations between relational aggression and ODD/CD symptoms do not differ for boys and girls, or for individuals born in Mexico vs. the U.S (see Table S3).

Discussion

The present study examined reciprocal (i.e., bidirectional) pathways between relational aggression and externalizing symptoms using a longitudinal, community-based sample of 674 Mexican-origin youth. Overall, we found that higher levels of relational aggression were associated with relative increases in ODD and CD symptoms and, conversely, higher ODD and CD symptoms were associated with relative increases in relational aggression. These effects held for both emotion dysregulation and defiance facets of ODD, boys and girls, youth born in the U.S. and in Mexico, and after controlling for physical aggression. We discuss the theoretical and applied implications of these findings below.

Relational Aggression as a Developmentally-Normative Behavior vs. Mental Health Concern

Our findings demonstrated that relational aggression served as a *precursor* to ODD and CD symptoms, in that youth who engaged in more relationally aggressive behavior against their peers were more likely to exhibit relative *increases* in ODD and CD symptoms from late childhood (age 10) to adolescence (age 16). Moreover, our results also showed that ODD

and CD symptoms *scarred* youths' interpersonal functioning and behavior, in that youth who experienced higher levels of ODD and CD symptoms earlier in development were more likely to relationally victimize their peers later in adolescence. When considering the modest magnitude of these effects, it is important to note that many other possible pathways linking the two variables are controlled for (e.g., their stability over time, their concurrent associations, and the reciprocal cross-lagged effect), so one would expect the remaining variance explained to be relatively small. Given this, the cross-lagged effects observed in the present study are far from trivial, at least in comparison to other studies of complex, multiply-determined outcomes. Moreover, the magnitude of the effect sizes suggests that there are individual differences in *who* is at risk when engaging in relationally aggressive behavior. In other words, some adolescents normatively display this behavior during this developmental period but then mature out of the externalizing pathway, whereas other adolescents engaging in relational aggression go on to develop more severe forms of behavioral problems in adolescence. More practically, these results imply that future research should focus on *how* and *why* relational aggression and ODD and CD symptoms are related over time for some individuals but not for others. It is possible that differences in the developmental progression of aggressive behavior is due to other individual, familial, and socio-cultural risk factors that exacerbate (i.e., moderate) and/or explain (i.e., mediate) the reciprocal relations between relational aggression and ODD and CD symptoms. For example, given the link between parenting practices and the development of relational aggression (Clark, Dahlen, & Nicholson, 2015), it is reasonable to hypothesize that youth who experience harsh treatment from their parents may have stronger co-developmental pathways between relational aggression and ODD and CD symptoms than youth who have warm and supportive parents. Additionally, youth who engage in relationally aggressive behaviors may have underlying impulsive and callous-unemotional traits that explain the developmental progression from relational aggression to ODD and CD symptoms (White, Gordon, & Guerra, 2015). Future research should aim to understand the nuances of individuals' co-development of relational aggression and externalizing problems from late childhood through adolescence.

Bidirectional Pathways Do Not Vary by Gender or Generational Status

Researchers have long debated whether boys engage in relational aggression to the same extent as girls, and little is known about whether the *link* between relational aggression and externalizing problems is equally strong for boys and girls. Given that externalizing symptomatology is generally more prevalent in boys (Berkout, Young, & Gross, 2011; Chaplin, Cole, & Zahn-Waxler, 2005), it is possible that the higher incidence of, and perhaps greater variance in, ODD and CD symptoms contributes to a stronger association between relational aggression and externalizing problems. However, we did not find a gender difference in relational aggression, ODD, or CD symptoms, or a difference in the degree to which relational aggression and disruptive behaviors co-develop over time. That is, the reciprocal associations between relational aggression and externalizing problems were similar for boys and girls. Future research should investigate these gender patterns in a clinical sample of youth diagnosed with ODD or CD, which may show more profound variation by gender.

We also found no differences between 1st and 2nd+ generation youth, contrary to the *Immigrant Paradox* (Garcia-Coll & Marks, 2011). Future research should investigate more in-depth cultural values (e.g., individualistic/collectivistic values) to gain more insight into the extent to which Mexican-origin adolescents endorse values associated with their heritage culture. Clearly, being born in Mexico versus the U.S. does not fully capture the cultural factors that might play a role in increasing or decreasing the incidence of, and longitudinal associations between, relational aggression and ODD and CD symptoms.

Limitations

The current investigation has several limitations that merit attention. First, as in most prior studies, relational aggression was assessed by self-reports. Although self-reports are no less biased than other methods, relational aggression is a dyadic transaction, and future research should incorporate the perspective of both sides of the interaction by including informant-reports by potential victims of relational aggression. Second, although our results held when controlling for physical aggression, our measure included only two items, which may overestimate the incremental validity of relational aggression relative to physical aggression. Therefore, future research should use more comprehensive measures of physical aggression when investigating these associations. Third, as noted above, it is important to examine specific Mexican cultural values that may help explain within-culture variability in these reciprocal pathways. Fourth, although we documented bidirectional associations between relational aggression and externalizing problems, we know little about *how* and *why* these associations hold for *some* individuals but not others. Future research should investigate the moderating and mediating processes that explain the association between relational aggression and externalizing problems.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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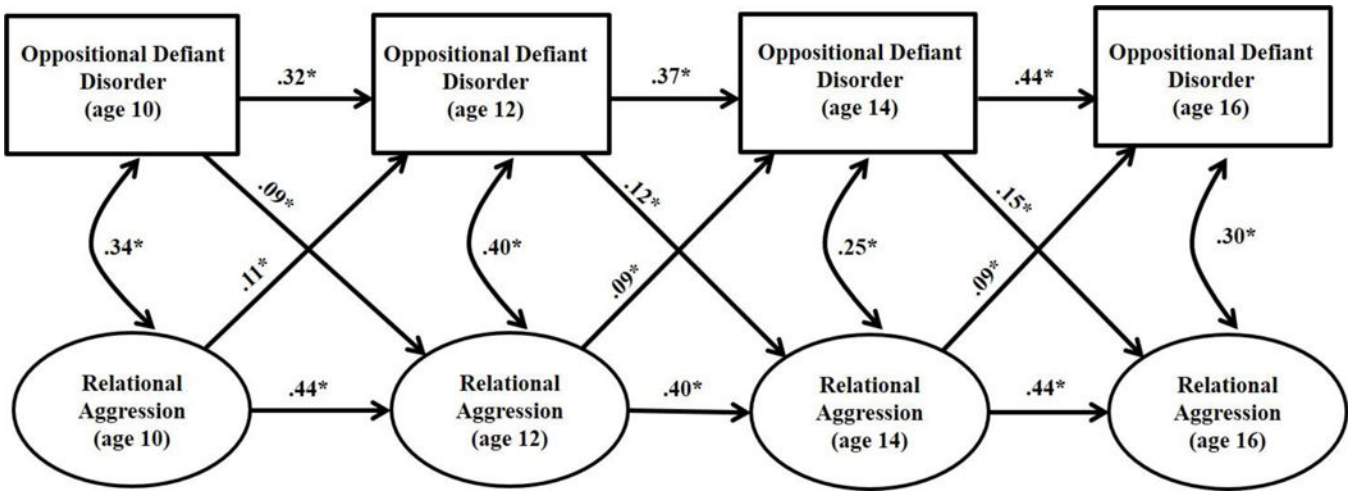

Figure 1.

Cross-lagged model of reciprocal relations between ODD and relational aggression from age 10 to 16

Note. Values in the figure indicate the standardized regression coefficients in the overall sample. Asterisk (*) denote values significant at $p < .05$.

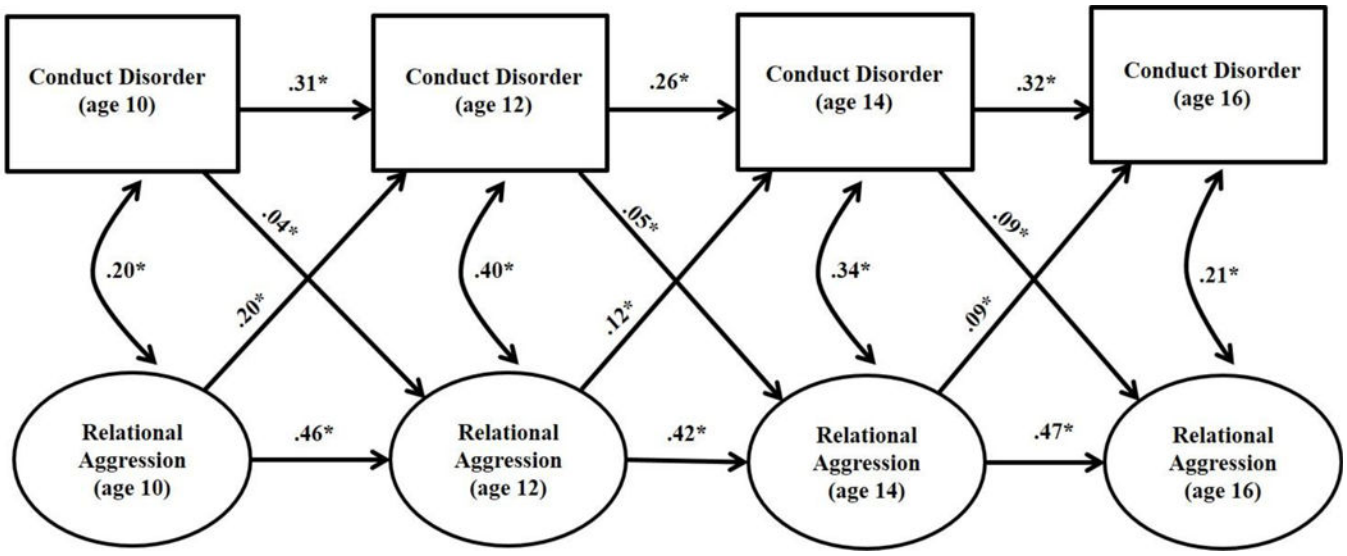

Figure 2.

Cross-lagged model of reciprocal relations between CD and relational aggression from age 10 to 16

Note. Values in the figure indicate the standardized regression coefficients in the overall sample. Asterisk (*) denote values significant at $p < .05$.