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Social Cognitive and Emotional Mediators Link Violence Exposure and Parental Nurturance to Adolescent Aggression

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Abstract

This study examined aggressive fantasies, violence-approving attitudes, and empathy as mediators of the effects of violence exposure and parental nurturance on aggression. A total of 603 early adolescents participated in a two-wave study, reporting on violence exposure and parental nurturance at Wave 1 and the three mediators and aggression at Wave 2. Violence-approving attitudes mediated the effects of both violence exposure and low parental nurturance on aggression. Aggressive fantasies also mediated the effects of violence exposure and empathy mediated the effects of parental nurturance. The mediation pathways via which parental nurturance was linked to aggression differed across levels of violence exposure. In the context of high violence exposure, parental nurturance was related to lower aggression through higher social emotional empathy, but under low violence exposure, the effect was mediated by greater disapproval of violence.

A number of studies have documented that adolescents' aggressive behavior is influenced by violence exposure in the community (Gorman-Smith, Henry, & Tolan, 2004), family (Margolin & Gordis, 2004), school (Janosz et al., 2008), and media (Bartholow, Sestir, & Davis, 2005). By contrast, much less is known about the mechanisms explaining these effects. Children's social cognitions and emotional functioning are well-known correlates of children's aggressive behavior (Marsee & Frick, 2007) and have been proposed as mediators linking violence exposure to aggression (Allwood & Bell, 2008). Furthermore, positive parenting practices, such as nurturance, protect children from aggressive behavior (Mrug, Elliott, et al., 2008), possibly by fostering prosocial cognitions (Dodge, 2002) and positive emotional functioning (Tisot, 2004). Although violence exposure also moderates the effects of parenting on aggression, the direction of these interactive effects varies across studies and parenting constructs (Gorman-Smith & Tolan, 1998; Li, Nussbaum, & Richards, 2007), and it is not clear whether violence exposure also modifies the mediating pathways of parenting on outcomes. This study evaluates social cognitions and empathy as mediators of the effects of violence exposure and parental nurturance on adolescent aggression, and tests whether violence exposure moderates the mediated links of parental nurturance on aggression.

Social Cognitions, Aggression, and Violence Exposure

According to social learning theory (Bandura, 1976), exposure to violence may increase aggression directly through modeling and imitation, or indirectly through changes in social cognitions. Children repeatedly exposed to violence tend to acquire schemas, beliefs, and information-processing patterns that promote aggressive behavior (Dodge, Bates, & Pettit, 1990). Social cognitions can be classified as more distal (e.g., aggressive schemas, attitudes,

and scripts) or proximal (e.g., hostile attributions, self-efficacy, and positive outcome expectations) determinants of aggressive behavior (Crick & Dodge, 1994). Although aggressive children report more hostile attributions, higher self-efficacy for aggressive behavior, and higher expectations of positive outcomes of aggression than non-aggressive children (Crick & Dodge, 1996; Marsee & Frick, 2007), these proximal cognitions do not appear to mediate the effects of violence exposure on aggression (Musher-Eizenman et al., 2004).

By contrast, distal aggressive schemas, such as normative beliefs and positive attitudes towards violence or aggressive scripts or fantasies, are associated with both violence exposure and aggressive behavior (Henry et al., 2000; Mrug, Loosier, & Windle, 2008). The mediating roles of these cognitions have been supported by studies of violence exposure in different settings (Gorman-Smith et al., 2004; Musher-Eizenman et al., 2004). However, one important limitation of this literature is the lack of distinction between proactive and reactive physical aggression. Proactive aggression can be characterized as goal-oriented, self-initiated non-impulsive aggressive behavior, whereas reactive aggression is impulsive and is typically triggered by a perceived threat or provocation. Although patterns of social information processing vary across proactive and reactive aggression (Crick & Dodge, 1996; Marsee & Frick, 2007), differences in cognitive schemas between these forms of aggression have not been evaluated. Likewise, it is not clear whether violence exposure increases the risk of both forms of aggression, and whether these relationships would be mediated by the same cognitive factors.

Emotional Functioning, Aggression, and Violence Exposure

Marsee and Frick (2007) distinguished between two aspects of emotional functioning in aggressive children: emotional coldness, characterized by low levels of emotional responsiveness and empathy, and emotional dysregulation, involving impulsivity and low frustration tolerance. Emotional dysregulation has been shown to mediate the association between violence exposure in childhood and later aggression (Dankoski et al., 2006). In contrast, the mediating role of empathy in violence exposure effects on aggression has been less addressed. It is important to note that although empathy represents an aspect of emotional functioning, it also incorporates social cognitions (e.g., perspective taking) (Eisenberg, 2000). Both the emotional and cognitive aspects of empathy can be affected by experience. Specifically, children repeatedly exposed to violence may become emotionally and cognitively desensitized to the impact of violence on others (i.e., become less empathic), and as a result be less restrained to behave aggressively (Funk, Baldacci, Pasold, & Baumgardner, 2004). Consistent with this theory, lack of empathy has been linked with violence exposure (Funk et al., 2004) and aggression (Eisenberg, 2000), especially with proactive aggression (Marsee & Frick, 2007). Furthermore, Bartholow et al. (2005) found that low empathy mediated the effects of exposure to video game violence on aggressive behavior. However, empathy has not been evaluated as a mediator of real-life violence exposure effects on aggressive behavior.

Parental Nurturance, Aggression, and Violence Exposure

A number of studies have linked aspects of positive parenting, including parental nurturance or warmth, with low levels of aggression in children (Chen, Wu, Chen, Wang, & Cen, 2001). These direct effects can be explained by parental nurturance fostering prosocial social cognitions in children, which in turn decrease the likelihood of aggressive behavior (Dodge, 2002). Consistent with the social learning perspective, children are also more likely to learn prosocial emotions (e.g., empathy) and emotion regulation skills from warm, nurturant parents (Robinson, 2007; Zhou et al., 2002). Although emotion regulation has been

supported as a mediator of parental warmth's effect on externalizing problems (Eisenberg et al., 2001), the mediating effects of emotional empathy have not been addressed.

In contrast to these direct, also termed "promotive" (Stouthamer-Loeber et al., 2002) effects on aggression, parental nurturance may also interact with violence exposure following one of two distinct patterns. It may follow the "protective-stabilizing" pattern by attenuating the negative impact of a risk factor (violence exposure) on adjustment, or the "protective-reactive" pattern, where it would be protective at low levels of risk but become "overwhelmed" at high levels of risk (Luthar, Cicchetti, & Becker, 2000). Both types of interactions have been reported for different parenting practices in face of violence exposure (Gorman-Smith & Tolan, 1998; Hammack, Richards, Luo, Edlynn, & Roy, 2004; Li et al., 2007). However, no studies evaluated such protective effects specifically for parental nurturance. In addition, no studies have examined whether the mediators of parental nurturance vary at different levels of violence exposure. Yet, to the extent that violence exposure affects children's emotions and cognitions, such mediating difference may exist.

Goals of the Present Study

In summary, previous studies have demonstrated that aggression-related cognitive schemas mediate the impact of context-specific violence exposure on aggression. In contrast, fewer studies have examined the role of emotional variables, especially empathy, in explaining the effects of violence exposure on aggression. Additionally, the distinction between reactive and proactive aggression has received little attention in relation to violence exposure. Finally, few studies have systematically examined social cognitions and empathy as mediators of parenting effects on aggression, and whether the mediating effects are affected by levels of violence exposure. This study addresses these gaps in research by examining cognitive schemas (violence-approving attitudes and aggressive fantasies) and emotional functioning (empathy) as mediators of the effects of parental nurturance and violence exposure on proactive and reactive aggression (see Figure 1). Additionally, we examine whether violence exposure moderates the mediated effects of parental nurturance on aggression. Specifically, we propose the following hypotheses:

1. Direct effects of violence exposure and parental nurturance. Higher levels of violence exposure and lower levels of parental nurturance will be directly associated with higher levels of proactive and reactive aggression.
2. Mediating effects. Violence-approving attitudes, aggressive fantasies, and low empathy will mediate the effects of violence exposure and low parental nurturance on aggression. Based on previous studies, we hypothesize that empathy will be more strongly associated with proactive than reactive aggression, and accordingly its mediating effects would be stronger for proactive aggression. In the absence of relevant literature, no hypotheses are made regarding differential associations of violence-approving attitudes and aggressive fantasies with proactive and reactive aggression.
3. Moderating effects of violence exposure and parental nurturance. Parental nurturance will exhibit either the protective-stabilizing or protective-reactive effects at high levels of exposure to violence. Mediating pathways of parental nurturance on aggression (via cognitive schemas and empathy) will differ across low vs. high levels of violence exposure.

Method

Participants

Eight-hundred-twenty-six 5th grade students were recruited from 17 Birmingham, AL area schools selected through a school-based probability sampling procedure. These students provided information during the initial in-school screening assessment (Wave 0). Of those, 704 children and their parents completed individual interviews at Wave 1 about 5 months later, and 603 families returned for Wave 2 individual interviews approximately 17 months after Wave 1. Only the 603 adolescents participating in all three waves were included in the current study. The average age of the participants was 11.8 years (*SD*=0.8) at Wave 1 and 13.2 years (*SD*=0.9) at Wave 2. The sample included 52% males and 20% Caucasians, 78% African Americans, and 2% other races/ethnicities. Family income ranged from below $5,000 to over $90,000, with a median of $25,000–30,000. Participants lost through attrition did not differ significantly from the retained participants in age or gender but included more Caucasian participants and families with higher income.

Procedures

At Wave 0, students completed self-report questionnaires in a group format at school, with trained staff available to answer questions and provide assistance as needed. At Wave 1 and 2, data were collected through individual interviews conducted by trained staff separately with children and caregivers, with sensitive questions answered privately through computer-assisted technology. The study was approved by the Institutional Review Board of the University of Alabama at Birmingham. Primary caregivers and children provided informed consent and assent prior to participation and were compensated financially for their time.

Measures

Proactive and reactive aggression—At Wave 2, adolescents responded to a measure of aggression adapted from Little, Jones, Henrich, and Hawley (2003). For this report, only the subscales of instrumental (proactive) and reactive overt (physical) aggression were used. The instrumental overt aggression scale contains 6 items asking whether adolescents often initiates physically aggressive behavior for personal gain (e.g., “You often start fights to get what you want”), whereas the reactive overt aggression scale includes 6 items assessing aggression in response to provocation (e.g., “When you are hurt by someone, you often fight back”). All items were rated on a 4-point scale ranging from ‘Not at all true’ (1) to ‘Completely true’ (4) and summed (α=.80 for proactive and .82 for reactive aggression). Although this measure was not used at Wave 1, Wave 0 included the instrumental overt aggression subscale, which was used to control for initial levels of aggressive behavior. The 6 items rated on a 3-point scale ranging from ‘Almost never’ (1) to ‘Very often’ (3) were summed (α=.86).

Violence exposure—Violence exposure was assessed with the Birmingham Youth Violence Study Violence Exposure measure (Mrug, Loosier, et al., 2008). At Wave 1, adolescents reported whether they witnessed or were a victim of 1) a threat of physical violence, 2) actual physical violence, or 3) a threat or actual violence involving a weapon during the past 12 months. Endorsement of any of these items was followed with three contextual probes, asking whether such an incident occurred at school, in the neighborhood, or at home. The responses were recoded into 18 indicator variables for each combination of type of violence (threat, actual violence, or weapon related), level of exposure (witnessing or victimization), and context (school, home, or neighborhood) (i.e., 3 types × 2 levels × 3 contexts). Examples of these indicators include ‘witnessing physical violence at school’ and ‘victim of a threat at home’. All these indicators were coded as 1 if the combination was endorsed and 0 if it was not endorsed. Because the focus of this study was on overall levels

of exposure to violence rather than differences by violence type or setting, total violence exposure was computed as the sum of all 18 indicators (α=.68). Validity of the scale was supported by positive correlations of violence exposure with adolescent internalizing and externalizing problems (Mrug, Loosier, et al., 2008).

Parental nurturance—At Wave 1, adolescents reported their perceptions of supportive and warm parenting behavior using a 5-item measure (e.g., "How often do your parents give you praise or encouragement?") (Barnes & Windle, 1987). Items were rated on a 3-point scale ranging from 'Almost never' (1) to 'Almost always' (3) and summed (α=.66). Previous studies reported higher internal reliability on this measure (α=.76 –.80; Barnes, Reifman, Farrell, & Dintcheff, 2000; Windle et al., 2010). Validity of the scale has been supported by positive correlations with other positive parenting practices (e.g., inductive control) and negative correlations with adolescent substance use and other problem behaviors (Barnes, Farrell, & Windle, 1987; Barnes & Windle, 1987).

Violence-approving attitudes—During Wave 2 interviews, adolescents responded to the Beliefs Supportive of Violence Scale (Bosworth & Espelage, 1999). Five items (e.g., "It's okay to hit someone who hits you first") were rated on a 5-point scale ranging from 'Strongly disagree' (1) to 'Strongly agree' (5) and summed (α=.61). In previous research, internal reliability of the scale was .71; validity was supported by positive correlations with bullying (Bosworth & Espelage, 1999).

Aggressive fantasies—An adaptation of the Aggressive Fantasy Scale of the Children's Fantasy Inventory (Huesmann & Eron, 1986; Rosenfeld, Huesmann, Eron, & Torney-Purta, 1982) was used at Wave 2 to assess adolescents' aggressive fantasies in the past 12 month. Six items (e.g., "When you get mad, do you sometimes imagine hitting or hurting other people?") were rated on a 3-point scale ranging from 'Never' (1) to 'A lot' (3) and summed (α=.75).

Social emotional empathy—At Wave 2, adolescents responded to 9 items of the Social-Emotional Competence-Empathy scale (Gresham & Elliott, 1990). Items measured the extent to which adolescents cared and showed respect for others' feelings (e.g., "How often do you feel sorry for others when bad things happen to them?"). A 3-point scale ranging from 'Never' (1) to 'Very often' (3) was used. The items were summed (α=.71). In previous research, this scale had acceptable internal reliability (α=.74 – .77) and a four-week test-retest reliability (*r*=.66). Validity of the scale was supported by positive correlations with self-concept (Gresham & Elliott, 1990).

Demographics—Demographic controls were assessed at Wave 1 and included gender, age in years, ethnicity, and family income. Gender and age information was provided by adolescents, and ethnicity and family income were reported by caregivers. Ethnicity was recoded into a dichotomous variable as Caucasian versus non-Caucasian, because there were too few participants in the "other" category to be analyzed separately. Family income was reported on an ordinal scale with 13 categories, ranging from below $5,000 to above $90,000. Higher values indicated female, racial/ethnic minority, and higher income.

Results

Missing Data Imputation

Sixty-six (11%) out of the 603 participants had missing data on one or more variables, but only 1% of total data points were missing. Little's MCAR test suggested no systematic pattern of missingness [$\chi^2(54) = 49.17$, *ns*]. In order to retain as much information as

possible for the main analyses and thus maximize power, we imputed missing values using the Expectation-Maximization algorithm in the SPSS Missing Value Analysis module. Examination of the imputed data set showed that 6 observations on baseline proactive aggression had imputed values less than the scale minimum of 6; these were recoded to 6. All other imputed values were within the appropriate ranges. The imputation allowed us to include all 603 participants in analyses.

Descriptive and Bivariate Correlations

Table 1 presents descriptive information and bivariate correlations for all study variables. Higher levels of exposure to violence and lower parental nurturance at Wave 1 were associated with higher levels of both proactive and reactive aggression at Wave 2. Consistent with our hypotheses, lower social emotional empathy and higher violence-approving attitudes and aggressive fantasies were linked with lower nurturance, higher violence exposure, and higher levels of both proactive and reactive aggression.

Direct Effects of Violence Exposure and Parental Nurturance on Aggression

As a prerequisite for mediation (Baron & Kenny, 1986), we first examined the direct effects of violence exposure and parental nurturance on aggression without mediators. After adjusting for demographic characteristics (children's age, gender, ethnicity, and family income) and baseline proactive aggression, violence exposure significantly predicted both proactive aggression ($\beta = .23$, $p < .001$) and reactive aggression ($\beta = .16$, $p < .001$). Higher parental nurturance was associated with lower levels of reactive aggression ($\beta = -.09$, $p < .05$), but not proactive aggression ($\beta = -.07$, *ns*).

Testing the Mediation Model

Next, structural equation modeling (SEM) was employed to test whether social emotional empathy, violence approving attitude, and aggressive fantasies mediate the associations of violence exposure and parental nurturance with aggression. All analyses were performed in Mplus version 5.2 (Muthén & Muthén, 1998–2010) using maximum likelihood estimation. All causal paths in the model were adjusted for the covariates (children's age, gender, ethnicity, family income, and baseline proactive aggression). Statistical significance of mediation effects was evaluated with the Model Indirect statement in Mplus.

First, we tested a full model in which violence exposure and parental nurturance were linked with the two aggression outcomes indirectly through all three mediators (see Figure 1), as well as directly (not depicted in Figure 1). In this and all following models, violence exposure and parental nurturance were allowed to covary with each other and all control variables, and proactive and reactive aggression could also covary. Additionally, covariations among the three mediators were included. This full model was just-identified (df = 0) so model fit indices indicated perfect fit. Of the three significant direct effects (violence exposure on proactive aggression and reactive aggression, and parental nurturance on reactive aggression), only one linking violence exposure to proactive aggression remained significant in this mediation model ($\beta = .18$, $p < .01$), suggesting full mediation of the other two direct effects. All other paths presented in Figure 1 were significant except the path linking violence exposure to social emotional empathy and path linking parental nurturance to aggressive fantasies. Although several modification indices were suggested, they were not conceptually meaningful and thus were not implemented in the revised model.

A reduced model was formulated by eliminating all nonsignificant paths. Model fit indices suggested a good fit of the reduced model [$\chi^2(5) = 5.00$, *ns*; CFI = 1.00; RMSEA = 0.00; SRMR = 0.01]. The reduced model with all standardized path coefficients is depicted in Figure 2. Higher levels of violence exposure were associated with more aggressive fantasies

and more approving attitudes toward violence, whereas lower parental nurturance was associated with more approving attitudes and lower social emotional empathy. All three mediators were in turn related to both types of aggression. Because the reduced model fit the data well and was more parsimonious than the full model, all following analyses were based on the reduced model.

Analyses of indirect effects indicated statistically significant mediation between violence exposure and proactive aggression via aggressive fantasies (β= 0.05, $z = 3.48$, $p < 0.001$) and via violence-approving attitudes (β= 0.02, $z = 2.31$, $p < 0.05$). These two indirect paths accounted for 21% and 8%, respectively, of the total effect of violence exposure on children's proactive aggression, with the remaining 71% being accounted by the direct path. The effect of violence exposure on reactive aggression was fully mediated by aggressive fantasies (β= 0.06, $z = 4.81$, $p < 0.001$) and violence-approving attitudes (β= 0.05, $z = 3.47$, $p < 0.01$), accounting for 54% and 46% of the total effect, respectively. As expected, children exposed to higher levels of violence reported more aggressive fantasies and more positive attitudes toward using violence, which in turn were related to more aggressive behavior.

The association between parental nurturance and reactive aggression was also fully mediated by violence-approving attitudes (β= −0.05, $z = -3.42$, $p < 0.01$) and social emotional empathy (β= −0.02, $z = -2.21$, $p < 0.05$), accounting for 70% and 30% of the total effect, respectively. Although the direct link between parental nurturance and proactive aggression was not significant, we found significant indirect effects via violence-approving attitudes (β= −0.02, $z = -2.30$, $p < 0.05$) and social emotional empathy (β= −0.04, $z = -3.18$, $p < 0.01$), accounting for 32% and 68% of the total effect, respectively. Higher nurturance was associated with lower approval of violence and more social emotional empathy that in turn predicted less proactive and reactive aggression. As hypothesized, social emotional empathy was associated more strongly with proactive aggression than with reactive aggression and the corresponding mediation effect was stronger.

Testing Moderating Effects of Violence Exposure

To examine whether violence exposure moderates the mediation pathways of parental nurturance on children's aggressive behavior, the total sample was divided into two subgroups: Low Violence Exposure group (below the mean on violence exposure, $n = 351$) and High Violence Exposure group (above the mean on violence exposure, $n = 248$). Only the part of the mediation model that dealt with the effects of parental nurturance on aggressive behavior was tested for moderation. That is, violence exposure was excluded because it was the moderating variable, and aggressive fantasies variable was excluded because it was not related to parental nurturance (see Figure 3 for the moderation model). The moderation hypothesis was evaluated with multigroup modeling by testing equivalence of the model across the two violence exposure groups. Specifically, we compared the fit of a constrained model (all paths fixed to be equal for both groups) with the fit of an unconstrained model (all paths were allowed to vary across the groups). As indicated by a significant chi-square difference [$\Delta\chi^2(33) = 93.55$, $p < 0.001$], the unconstrained model showed a better fit, suggesting that the effects of parental nurturance on aggressive behavior differed across the high and low violence exposure groups.

Standardized path coefficients for both groups are depicted in Figure 3. Follow-up tests of invariance for individual path estimates across groups were conducted by freeing one path at a time and comparing the model with the fully constrained model. Four paths were found unequal across the two violence exposure groups, and were indicated by bold lines in Figure 3. Parental nurturance predicted social emotional empathy more strongly in the low violence exposure group than in the high violence exposure group [$\Delta\chi^2$ (1) = 4.84, $p < 0.05$]. Additionally, proactive aggression was more strongly associated with violence-approving

attitudes [$\Delta\chi^2$ (1) = 6.65, $p < 0.01$], but less strongly associated with social emotional empathy [$\Delta\chi^2$ (1) = 16.09, $p < 0.001$] and reactive aggression [$\Delta\chi^2$ (1) = 21.63, $p < 0.001$] in the low violence exposure group.

Additionally, analyses of indirect effects suggested that the pathways via which parental nurturance affected children's aggressive behavior differed across the two groups. In the low violence exposure group, the effects of parental nurturance on both proactive and reactive aggression were mediated by violence-approving attitudes (β= −0.04, $z = -2.75$, $p < 0.05$, and β= −0.10, $z = -3.53$, $p < 0.01$, respectively). By contrast, in the high violence exposure group, the effects of parental nurturance on both proactive aggression and reactive aggression were mediated by empathy (β= −0.05, $z = -2.54$, $p < 0.05$, and β= −0.03, $z = -2.15$, $p < 0.05$).

Additional Analyses

All main analyses described in this paper were repeated using listwise deletion of cases with missing data, as well as full information maximum likelihood (FIML) handling of missing data in Mplus. In both cases, the results were almost identical to those reported above with missing data imputed. Additionally, because students were clustered within schools which may violate the assumption of independence, we reanalyzed the data accounting for such clustering using the complex sampling option in Mplus. Again, the pattern of results remained unchanged.

Discussion

Consistent with existing literature, high violence exposure and low parental nurturance were associated with higher levels of subsequent aggression. Although violence exposure predicted both proactive and reactive aggression, parental nurturance directly served as a promotive factor only for reactive, but not proactive aggression. Additionally, different patterns of mediation emerged for each predictor. Violence exposure was related to aggression through violence-approving attitudes and aggressive fantasies, whereas parental nurturance effects were mediated by violence-approving attitudes and social emotional empathy. Consistent with predictions, empathy was associated more strongly with proactive than reactive aggression. Finally, the promotive effects of parental nurturance through violence-approving attitudes and empathy were moderated by violence exposure. Under high levels of violence exposure, parental nurturance was related to lower aggression through emotional empathy, but the effects were mediated by disapproval of violence under low levels of violence exposure.

The lack of a direct link between parental nurturance and proactive aggression was inconsistent with previous literature. This unexpected finding could be explained by low levels and restricted variability of proactive aggression in our sample [M (SD) = 6.59 (1.59) for proactive vs. 11.16 (4.20) for reactive aggression, with scale minimum of 6]. The low level of endorsement and variability of proactive aggression may be due to a generally lower level of proactive than reactive aggression among children this age (Salmivalli & Nieminen, 2002). The use of self-report to measure aggression may have also contributed to the restricted range and/or lack of association with parental nurturance, as self-report typically generates lower scores than parent or teacher reports of aggression (McAuliffe, Hubbard, Rubin, Morrow, & Dearing, 2006). Alternatively, it is possible that other parenting practices, such as harsh discipline or indulgent parenting, are more predictive of proactive aggression than low parental nurturance (Xu, Farver, & Zhang, 2009).

Violence-approving attitudes served as a common mediator for the effects of both violence exposure and parental nurturance on aggression. Being chronically exposed to violence may

desensitize children to its negative consequences and teach them to accept violence as normative (Dodge et al., 1990). However, nurturant parents are more likely to detect and "correct" such beliefs through interaction with children and a good parent-child relationship (Chen et al., 2001). By contrast, aggressive fantasies only mediated the effects of violence exposure, but not parental nurturance, on aggression. Children who encounter violence are more likely to produce aggressive scripts and to mentally rehearse them (which may manifest as fantasies), compared with children exposed less to violence (Musher-Eizenman et al., 2004). By contrast, low parental nurturance does not necessarily involve aggressive behavior of the parents. It is likely that parenting behaviors involving aggression, such as harsh discipline or parental conflict, would be related to children's development of aggressive behavior through the acquisition of aggressive scripts.

Our study found no association between self-reported violence exposure and emotional empathy, consistent with findings of a previous study (Funk et al., 2004). Funk et al. speculated that levels of real-life violence exposure in their sample were not high enough to reach a critical threshold for diminishing empathy. However, despite relatively high rates of violence exposure in our sample (about 80% participants witnessed violence and 38% were victimized last year), we also failed to find an association between violence exposure and low empathy. It is possible that diminished empathy is the result of high severity of the encountered violence rather than the incidence or frequency of violence exposure. This is suggested by studies linking more severe forms of violence exposure, such as victimization via community violence, with higher levels of posttraumatic stress disorder symptoms, including deficits in empathy (Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009). Compared with these studies, our sample likely experienced lower severity of victimization, and combining victimization with witnessing into a single measure of violence exposure may have further diminished any possible association of victimization with decreased empathy. Additionally, it is possible that violence exposure may diminish some aspects of empathy but not others. For instance, some cruel criminals are characterized by being talented in perspective taking (a cognitive aspect of empathy) but having no sympathy (i.e., emotional empathy) for their victims (Goleman, 2006). Future studies that link different types of violence exposure (witnessing, victimization) with different aspects of empathy (cognitive and emotional) may shed light on these discrepancies regarding the effects of violence exposure on empathy.

In terms of moderating effects of violence exposure, we found that parental nurturance was differentially related to social cognitions and empathy, and subsequently aggression, under low and high levels of violence exposure. Within the context of high violence exposure, parental nurturance was not associated with negative attitudes toward violence, and its association with emotional empathy was significantly lower in comparison to the low violence exposure group. This suggests that parental nurturance may be less able to protect adolescents against the adverse consequences of violence exposure when encountering high levels of violence exposure, an instance of the protective-reactive effect (Luthar et al., 2000). However, as the direct moderating effect of parental nurturance on the link of violence exposure and aggression was not tested (i.e., we only tested moderation of the mediated effect), it is possible that parental nurturance may buffer against aggressive behavior in children exposed to violence, albeit through different mediators than those included in this study.

Another interesting result was that the promotive effects of parental nurturance were explained by empathy under high violence exposure, but by violence-approving attitudes under low violence exposure. At low levels of violence exposure, emotional empathy was not associated with either form of aggression. This may be due to lower levels and less variability of aggression in the low violence exposure group than in the high violence

exposure group [reactive aggression: $M(SD)$=10.30 (3.73) vs. 12.38 (4.54); $t(468)= -5.96$, $p < .001$; proactive aggression: $M(SD)$=6.34 (0.99) vs. 6.94 (2.12); $t(327) = -4.14$, $p < .001$].

Despite the strengths of this study, such as prospective design and testing of novel questions, several limitations need to be noted. First, this study only included physical aggression, because it was more conceptually similar and empirically related to violence exposure as measured in this and most other studies. However, relational aggression (hurting others through spreading rumors or social exclusion) has been also associated with violence exposure, approval of violence, aggressive fantasies, low empathy, and impulsivity (Marsee & Frick, 2007; Musher-Eizenman et al., 2004). Future studies should also examine the role of cognitive and emotional mediators in violence exposure's effects on relational aggression. In addition, our measurement of violence exposure did not incorporate many important dimensions of exposure, such as frequency or severity of the violence. For instance, it is likely that being a victim of physical violence has stronger effects than witnessing a threat of violence, but both types of incidents contributed equally to the overall score on our measure. Future studies may benefit from taking into account multiple important dimensions of violence exposure, such as frequency, severity, context, or relationship with the perpetrator, and examining their role in children's aggression and mediating processes. .

Second, all measures used in this study relied on adolescents' self-report. This may have resulted in underestimates of the frequency of aggressive behavior, inflation of some of the obtained relationships due to shared-method variance, and bias in some of the measured constructs. Future studies would benefit from including multiple informants, especially to measure children's aggression. Additionally, several measures had relatively low reliability which may have attenuated the results.

Third, although the study utilized longitudinal data and controlled for baseline levels of proactive aggression, we were not able to control for baseline levels of reactive aggression because this form of aggression was not measured before Wave 2. Moreover, only two waves of data were available for this study, so a time lag between the mediators and outcomes could not be incorporated. To provide stronger base for causal inference, it would be helpful in future studies to model the predictors, mediators, and outcomes across three sequential time points.

Fourth, other potentially important mediators were not included, such as emotion dysregulation and other relevant social cognitions, such as online information-processing, attributions, and outcome expectations. In addition, parental nurturance may not only moderate the effects of violence exposure, but could also serve as a mediator of its effects. For instance, maternal depression mediated the effects of community violence exposure on children's behavior problems (Aisenberg, Trickett, Mennen, Saltzman, & Zayas, 2007). Children's violence exposure was negatively correlated with parental nurturance in the present study, consistent with a possible mediating relationship. Future studies may benefit from examining parental nurturance as a mediator of violence exposure effects on aggression.

Finally, we did not address potential gender or ethnic differences in the studied relationships. Some research suggests that the negative effects of violence exposure on physical aggression (Cullerton-Sen et al., 2008), as well as the buffering effects of positive parenting (Aceves & Cookston, 2007) are stronger for males. Similarly, some parenting practices, such as harsh discipline, have been more strongly linked with externalizing problems in Caucasian than African American youth (Lansford, Deater-Deckard, Dodge, Bates, & Pettit, 2004). However, other studies found no ethnic differences in the effects of multiple parenting practices (e.g., monitoring, norms, nurturance) on externalizing problems

(Vazsonyi & Pickering, 2003; Windle et al., 2010). In light of possible gender and ethnic differences, it would be valuable for future studies to examine gender and ethnicity as moderators of violence exposure effects on aggression. Additionally, the present results may not generalize to other populations than those included in this study (i.e., primarily low income, African American families).

Implications for Research, Policy, and Practice

This study found several interesting mediating and moderating mechanisms that may help explain the detrimental effects of violence exposure and the protective effects of parental nurturance on adolescents' aggressive behavior. However, as we only addressed parental nurturance, other facets of positive parenting such as monitoring, communication, and discipline or limit setting need to be studied in relation to exposure to violence, social cognitions, and emotional functioning. Also, negative aspects of parenting such as neglect, harsh discipline, and family conflict may amplify the negative effects of violence exposure. Because it is not uncommon for positive and negative parental practices to co-occur within the same family, further research should include more diverse parenting behaviors to provide a complete insight on the roles of parenting and violence exposure children's aggressive behavior.

This study revealed several mediational mechanisms through which violence exposure and parental nurturance may affect aggression, including aggressive fantasies, violence-approving attitudes, and emotional empathy. Clinicians who work with children exposed to violence or low parental nurturance may need to address those cognitive and emotional components in interventions to reduce or prevent the development of aggressive behavior. Another strategy is to work directly with parents to improve their parenting behaviors, such as nurturance. The results also indicate that parental nurturance may not be enough to compensate for the negative effects of violence exposure, and additional interventions and social supports may be needed. Finally, this study adds to a large body of literature identifying violence exposure as a key risk factor for adolescent aggression. Preventing exposure to violence in children's schools, homes, and communities needs to remain an important priority for policy makers, educators, other professionals, and families and communities.

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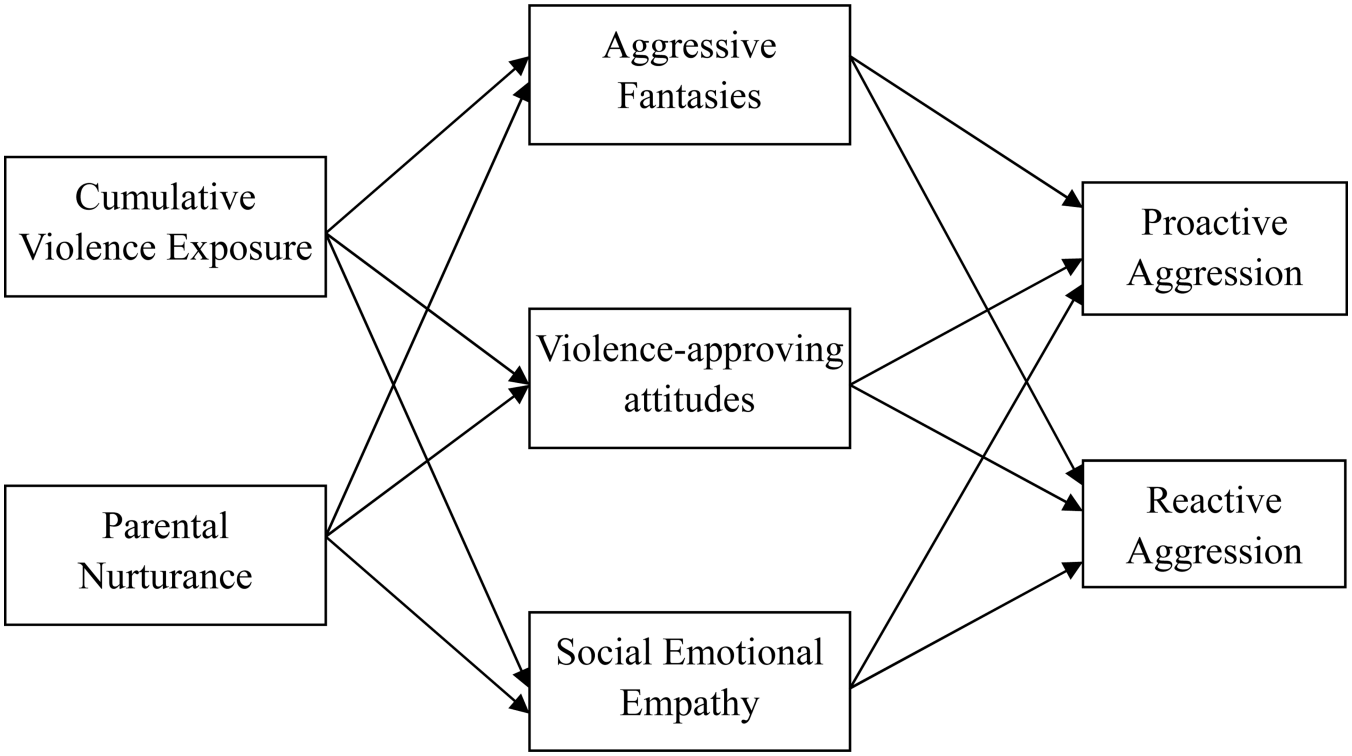

Figure 1.
Hypothesized mediation model linking violence exposure and parental nurturance with children's aggressive behavior. Direct links from violence exposure and parental nurturance to aggressions are not depicted for simplicity.

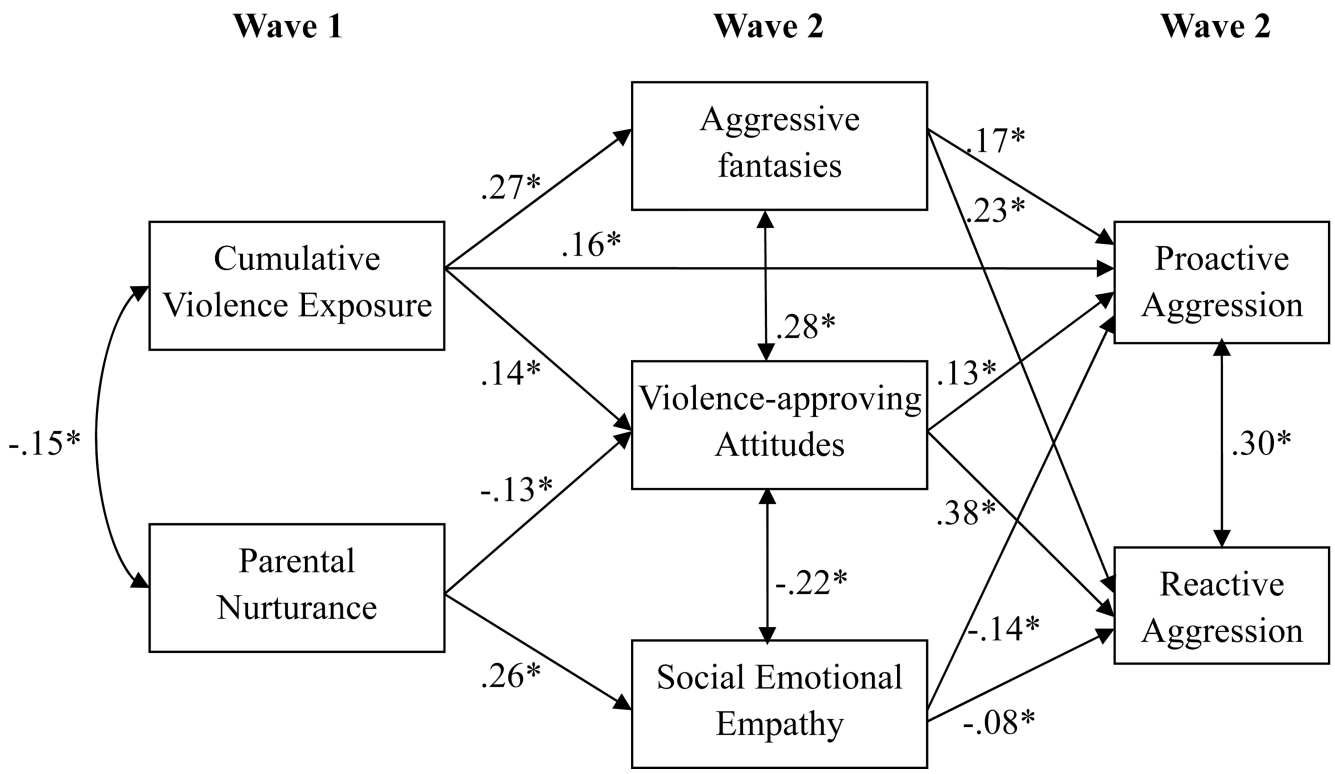

Figure 2.
Reduced mediation model linking violence exposure and parental nurturance with children's aggressive behavior. All paths were adjusted for children's age, gender, ethnicity, family income, and baseline level of proactive aggression.* $p < .05$.

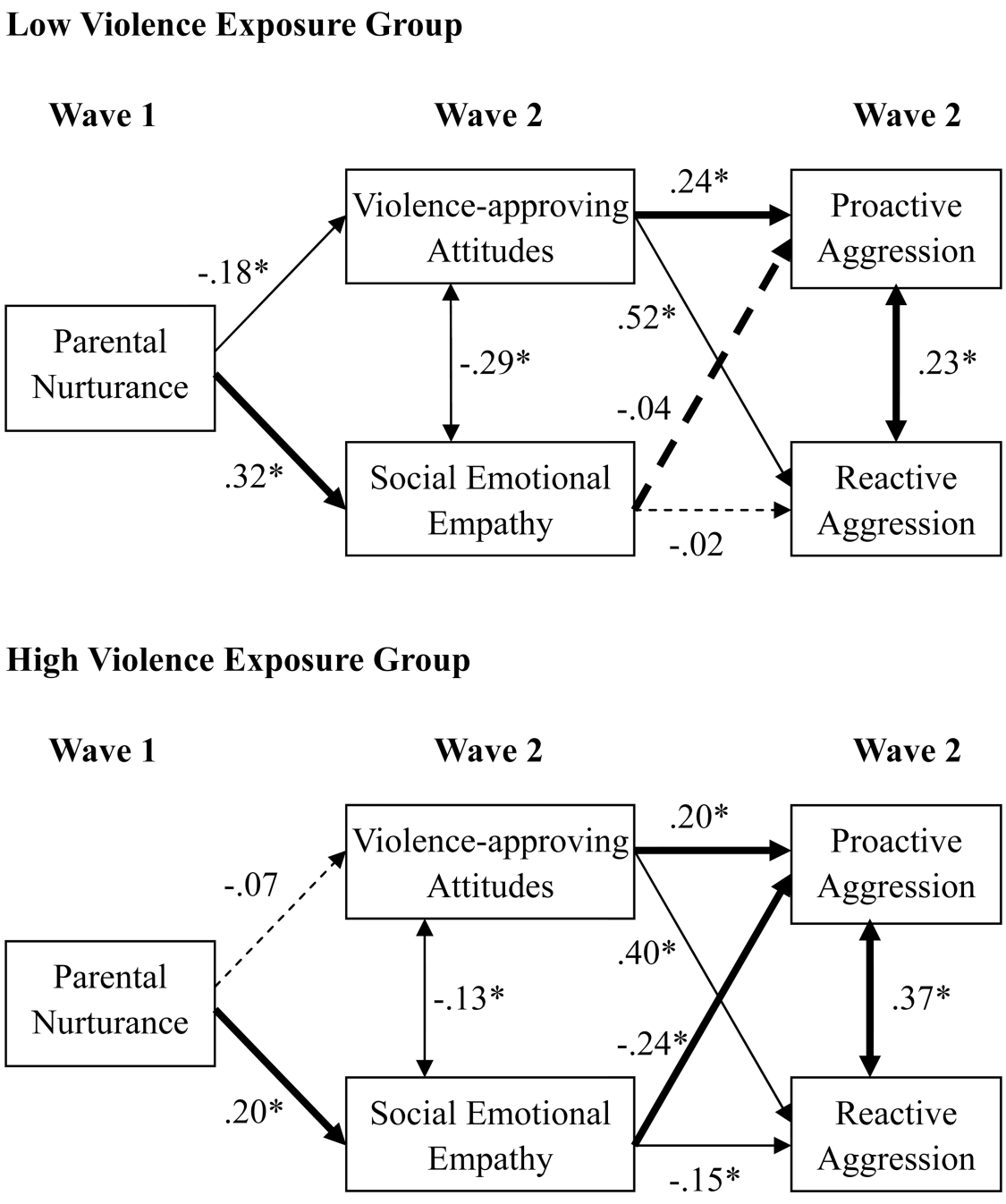

Figure 3.
Indirect effects of parental nurturance on adolescent aggression were moderated by violence exposure. Bold lines represent paths which differ significantly across low vs. high violence exposure groups. Dashed lines are not statistically significant. * $p < .05$.

Table 1

Descriptive Statistics and Correlations of All Variables

	Mean (SD)	Range	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
Wave 1													
1. Age	11.77 (0.76)	9–15	1.00										
2. Female gender (%)	48.1%	0–1	−.07	1.00									
3. Racial/Ethnic minority (%)	79.6%	0–1	.19*	.11*	1.00								
4. Family income	6.39 (3.77)	1–13	−.27*	−.11*	−.35*	1.00							
5. Proactive aggression	7.30 (2.33)	6–18	.20*	−.07	.10*	−.07	1.00						
6. Violence exposure	2.48 (2.18)	0–13	.13*	−.11*	.18*	−.18*	.23*	1.00					
7. Parental nurturance	12.75 (1.98)	6–15	−.07	.05	−.06	.10*	−.16*	−.20*	1.00				
Wave 2													
8. Social emotional empathy	23.24 (2.69)	11–27	−.14*	.12*	−.14*	.19*	−.20*	−.10*	.31*	1.00			
9. Violence-approving attitudes	13.07 (4.64)	5–25	.12*	.00	.23*	−.19*	.21*	.23*	−.20*	−.30*	1.00		
10. Aggressive fantasies	9.38 (2.75)	6–18	.18*	−.04	.20*	−.19*	.19*	.34*	−.10*	−.14*	.37*	1.00	
11. Reactive aggression	11.16 (4.21)	6–24	.21*	−.11*	.23*	−.15*	.29*	.28*	−.18*	−.28*	.54*	.44*	1.00
12. Proactive aggression	6.59 (1.60)	6–24	.09*	−.01	.05	−.07	.24*	.28*	−.14*	−.22*	.27*	.29*	.44*

Note: Gender was coded 0 for male and 1 for female. Ethnicity was coded 0 for Caucasians and 1 for African Americans and others. Family income was rated on a 13-point scale, with higher values indicating higher income. $N = 603$.

* $p < .05$ or lower.