

Gender and the Transmission of Risk: A Prospective Study of Adolescent Girls Exposed to Maternal Versus Paternal Interparental Violence

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Violence perpetrated by young women typically occurs in close relationships. This study assessed the impact of exposure to interparental violence (IPV) on girls' perpetration of violence within romantic relationships and examined whether this relationship was mediated through sensitivity to interpersonal rejection (RS). Exposure to maternal IPV predicted girls' romantic partner aggression in adolescence and 5 years later in young adulthood. Additionally, girls high on RS were at increased risk of aggression in romantic relationships in adolescence and young adulthood. RS mediated the relationship between IPV and levels of romantic partner aggression in adolescence, but not into young adulthood. These effects remained stable even when paternal IPV and other forms of parental abuse were controlled.

Aggressive behavior in girls has received relatively little attention, perhaps due to assumptions that such problems are almost exclusively found in boys and men. Counter to this view, studies show that females perpetrate aggression in intimate relationships at least as frequently as do males. For example, Straus and Ramirez (2007) found almost identical rates of involvement in severe physical attacks toward romantic partners for women (11.6%) and men (11.0%). Archer's (2000) meta-analytic review of 82 studies revealed similar results: women were slightly more likely than men to engage in violence toward their partners, but they were also slightly more likely to be injured in violent partner altercations. Although the involvement of girls and women in aggressive behavior toward their intimate partners is increasingly recognized, relatively little is known about the factors that place girls at risk of perpetrating such acts. This study examined two factors that are important in this regard: exposure to maternal versus pater-

nal interparental violence (IPV) and sensitivity to interpersonal rejection. We examined whether girls who witnessed IPV were more likely to perpetrate aggression in their romantic relationships. We also assessed the role of sensitivity to interpersonal rejection as both a risk factor for aggression and a mediator of the impact of IPV. This study is unique in that it focuses on a subgroup of young women at elevated risk for aggression and includes repeated assessments of relationship violence in adolescence and in early adulthood.

Exposure to Parental Partner Violence

Children who witness IPV are at risk for a broad range of psychological, social, and physical health problems including depression and anxiety (Kerig, 1998; Wolfe, Crooks, Lee, McIntyre-Smith, & Jaffe, 2003); post-traumatic stress disorder (McCloskey & Walker, 2000); poor school performance (Huth-Bocks, Levendosky, & Semel, 2001; Peek-Asa et al., 2007); poor health and disturbances of sleep and physical growth (El-Sheikh, 2005; El-Sheikh, Buckhalt, Cummings, & Keller, 2007; Graham-Bermann et al., 2008; McFarlane, Groff, O'Brien, & Watson, 2003). Not surprisingly, aggressive behavior is higher among children who have witnessed IPV versus those who have not (Hazen, Connelly, Kelleher, Barth, & Landsverk, 2006; Jaffe, Wolfe, Wilson, & Zak, 1986). Of particular importance to the current study is research showing that a his-

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tory of childhood exposure to IPV predicts heightened risk for partner violence (Stith et al., 2000). This association has been established in well-designed prospective studies (e.g., Ehrensaft et al., 2003), with effect sizes typically falling in the small to medium range (Stith et al., 2000). Importantly, exposure to IPV remains significant even when other types of co-occurring maltreatment, such as physical abuse, are controlled suggesting that it is uniquely important in risk prediction (Jouriles, Mueller, Rosenfield, McDonald, & Dodson, 2012; Moretti, Osbuth, Odgers, & Reebye, 2006).

The modest effect sizes noted above indicate that not all children exposed to IPV go on to perpetrate aggression in their romantic relationships. Gender may influence transmission of risk; however, research findings are contradictory: some studies show associations between exposure to parental IPV and aggression in romantic relationships only for daughters; other studies show associations only for sons (Mihalic & Elliott, 1997; O'Leary, Malone, & Tyree, 1994); and some report few (Smith, Ireland, Park, Elwyn, & Thornberry, 2011) or no gender effects (Ehrensaft et al., 2003; Fite et al., 2008). Few studies have examined the influence of the gender of the IPV perpetrator on child outcomes. In one of the few studies to assess the differential impact of maternal versus paternal IPV, Ulman and Straus (2003) found that children who observed *only* their mothers' perpetration of IPV were more aggressive than children who observed *only* their fathers' perpetration. It should be noted, however, that this study did not examine differential effects of maternal versus paternal IPV on risk in daughters versus sons.

Gender-linked transmission can only be examined if *both* the gender of the perpetrator and the gender of the child witness are jointly considered; however, this has been explored in few studies. In a retrospective study, Jankowski, Leitenberg, Henning, and Coffey (1999) found that young adults who observed their same-sex parent perpetrate IPV were at higher risk of being physically aggressive toward their romantic partners while those who observed their opposite-sex parent perpetrate IPV were not. These findings suggest "same-sex modeling"; however, gender differences in these relationships were not statistically tested due to sample size limitations. In a more recent study, we examined gender-linked associations between exposure to maternal versus paternal IPV and daughters' and sons' aggression in peer and romantic relationships (Moretti et al., 2006). Counter to social learn-

ing models that would predict that girls' exposure to maternal IPV and boys' exposure to paternal IPV would result in heightened risk, we found that girls' and boys' perpetration of aggression in romantic relationships was related to maternal IPV. Paternal IPV was unrelated to girls' use of aggression in romantic relationships although a weak relationship was evident for boys. Similar findings were reported by Verlaan and Schwartzman (2002), but with respect to transmission of risk for externalizing behavior problems: maternal antisocial behavior had a significant relationship with daughters' and sons' risk of externalizing behaviors, but paternal antisocial behavior was related only to sons' problem behavior.

These preliminary findings suggest that exposure to maternal IPV may play an especially important role in determining children's risk of perpetration of relationship violence. Several reasons may account for such a relationship. First, mothers more frequently than fathers serve as primary caregivers and thus provide more frequent modeling to their children. This view was proposed by Hendy et al. (2003) who found that risk in daughters was associated with witnessing maternal but not paternal IPV. She concluded that "the power of the mother as a model of violence may derive less from her gender and more from her role as primary caregiver and more frequent model" (p. 658). Second, based on research showing that mothers are more frequently identified by their children as primary attachment figures (e.g., Rosenthal & Kobak, 2010), children may be particularly influenced by how their mothers navigate interpersonal interactions that are emotionally provocative. Such reasoning does not preclude the significance of father-perpetrated IPV in risk transmission, but simply proposes that maternal-perpetrated IPV may exert a powerful influence due to frequency of exposure and emotional salience.

Previous findings are also limited as they examine only the concurrent but not prospective relationships between maternal and paternal IPV and adolescents' aggression in romantic relationships. Hendy et al.'s (2003) study was also limited as it relied on adults' reports of aggression in their current relationships and retrospective accounts of exposure to IPV in childhood. The current study extends past research by examining the relationship of daughters' reports of exposure to maternal versus paternal IPV in adolescence and their perpetration of aggression in relationships concurrently (in adolescence) and prospectively (in early adulthood).

Rejection Sensitivity

Children who witness IPV are often the victims of multiple forms of maltreatment (Banks, Landsverk, & Wang, 2008). Poly-victimization has significant and broad effects on children's development, among them the development of biases or distortions in interpreting and responding to social information (Lee & Hoaken, 2007). Downey, Irwin, Ramsay, and Ayduk (2004) propose that exposure to child maltreatment and early rejection leads children to be vigilant to rejection from others. As a result, ambiguous or minimal cues of rejection may be perceived as threatening, leading to activation of a "defensive motivational system," which in turn triggers damaging interpersonal responses (Downey, Mougios, Ayduk, London, & Shoda, 2004; Romero-Canyas, Downey, Berenson, Ayduk, & Kang, 2010). "Rejection sensitivity" (RS), as coined by Downey and colleagues, can provoke two different but not mutually exclusive responses—*anxiety and anger*. Anxious expectations of rejection result in internalizing symptoms such as depression and social withdrawal (London, Downey, Bonica, & Paltin, 2007). Of particular importance to the current study, however, are angry expectations that have been associated with hostile thoughts and aggressive interpersonal behavior (Ayduk, Downey, Testa, Yen, & Shoda, 1999; Ayduk, Gyurak, & Luerseen, 2008; Downey, Irwin, et al., 2004). Such thoughts and interpersonal behaviors create a vicious cycle, effectively perpetuating aggressively toned expectations and interpersonal behaviors (Downey, Irwin, et al., 2004; Purdie & Downey, 2000).

Studies have confirmed that exposure to family violence, parental emotional neglect, and conditional love by parents during childhood are associated with expectations of rejection in adolescence and young adulthood (Downey, Bonica, & Rincón, 1999; Downey, Feldman, Khouri, & Friedman, 1994; Downey, Khouri, & Feldman, 1997). Rejection in the form of harsh parenting practices has also been associated with increased expectations of rejection in school-aged children over time (Purdie & Downey, 2000).

The association between RS anger (RSA) and aggression has been found in both females and males; however, research has shown this relationship is stronger and observed more consistently in young women (Downey, Irwin, et al., 2004). In addition, women and men with high levels of RS show different types of behaviors in intimate relationships: young women display unsupportive

behavior toward their partners, while young men show controlling and jealous behaviors (Downey & Feldman, 1996).

In sum, this research suggests that girls exposed to parental IPV are likely at risk of developing RSA, and in turn RSA may mediate whether girls perpetrate aggression in their own romantic relationships. In particular, girls who are sensitive to interpersonal rejection and who also observe their mothers' aggression toward their partners may be at highest risk for romantic relationship aggression.

The Current Study

The current study investigated the influence of exposure to maternal- and paternal-perpetrated IPV and RSA on girls' risk of perpetrating aggression in romantic relationships. We recruited a sample of adolescent girls known to be at high risk for aggressive and antisocial behavior for two reasons: (1) the base rate and distribution of aggressive behavior were anticipated to be adequate to detect meaningful relationships and (2) this sample represents a vulnerable population for whom intergenerational transmission of risk could potentially benefit from risk-reduction interventions.

Based on prior research, we expected that maternal more than paternal IPV would predict higher levels of girls' aggression in romantic relationships in adolescence and prospectively in early adulthood. Thus, we compared the predictive relationships of maternal versus paternal IPV on girls' aggression in romantic relationships in adolescence and early adulthood. We also expected exposure to IPV to be related to RSA and, in turn, for RSA to be predictive of higher levels of girls' aggression in romantic relationships. Further, we predicted that RSA would mediate the relationship between exposure to IPV and girls' aggression in romantic relationships in adolescence and early adulthood. Finally, we tested whether the predictive effects of IPV were unique after controlling for exposure to physical and psychological child maltreatment.

METHOD

Participants

Participants for this study were drawn from a larger longitudinal project investigating risk and protective factors among girls at high risk for aggressive and antisocial behavior. Girls ($N = 139$)

were recruited during a 14-month enrollment period at a large south-eastern custody center. Approximately 93% of the girls who were invited to participate in the study agreed to do so. Active voluntary consent was obtained from all girls; active parental consent was obtained for those under the age of 18. Confidentiality was assured to all participants. Protocols were approved by the Institutional Review Boards at the participating university as well as by the Department of Juvenile Justice.

At the time of enrollment, girls ranged in age from 13 to 19 years of age ($M = 16.26$, $SD = 1.25$). Five years following the initial assessment, 120 of the study participants were reassessed in the community at a mean age of 21 years ($SD = 1.43$). The sample was primarily African American (50.0%), with 38.4% self-identifying as Caucasian; 2.2% as Native American; 1.4% as Hispanic; and 8.0% as "other" ethnicity.

With respect to family configuration, most girls (83.7%) identified their biological mother as their primary maternal figure. Of those who did not identify their biological mother as their primary maternal figure, most (76.1%) identified their adoptive mother, grandmother, or stepmother in this role. The remainder (23.9%) of girls identified other figures (e.g., foster mother, aunt or other relative) as their primary maternal figure. The majority (65.6%) of girls identified their biological father as their primary paternal figure. Of those who did not identify their biological father as their primary paternal figure, most (73.2%) identified their adoptive father, grandfather, or stepfather in this role. For 26.8% of girls, other figures (e.g., foster father, uncle, mother's boyfriend, or boyfriend's father) were identified as primary paternal figures.

To gain an understanding of family environment issues that are often related to family violence, girls were asked to identify to the best of their knowledge whether their mother or father had ever been arrested or convicted of a crime or had ever had a problem with alcohol use or drug use. Results showed that maternal and paternal criminal involvement and substance use were elevated in this sample. Over one-third (36.8%) of girls reported their mother had been arrested or convicted of a criminal offense, and approximately one quarter reported that their mother had alcohol (24.2%) or drug (27.8%) use problems. Almost two-thirds (63.9%) of girls reported their father had been arrested or convicted of a criminal offense, and approximately half reported that their father had alcohol (47.1%) or drug (45.4%) use problems.

With respect to girls' criminal offense histories, at admission to the study, girls had been arrested for an average of 13.3 past offenses ($SD = 7.2$); 91.4% of girls had been arrested for five or more offenses; and 80.7% of girls had been arrested for at least one violent offense. Additional information on girls' lifetime engagement in delinquent and violent acts was assessed using an adapted version of the Self-Report of Delinquency (SRD; Elliott & Huizinga, 1989), a well-established and frequently used measure in similar populations (Piquero & Chung, 2001; Piquero, MacIntosh, & Hickman, 2002). Full results are reported in Odgers et al. (2007). With respect to lifetime history of violent acts, 93.9% of girls indicated they had been in a fistfight; 45.1% indicated they had used a weapon while fighting; 40.6% attacked someone with the idea of seriously hurting or killing that person; and 26.5% shot at someone.

Procedure

Girls were assessed using an extensive battery of measures at enrollment and at 2- and 5-year follow-up. Data for this study were drawn only from our first and third waves of data collection as these waves contained the measures required for the current analyses. In the current article, we refer to assessment at entry to the study as Time 1 and assessment 5 years later as Time 2. At Time 1, girls completed a research protocol including a clinical interview, computerized diagnostic assessment, and a battery of self-report measures including those described below. Five years following the initial assessment (Time 2), girls again completed this research protocol from which the measures described below were extracted.

Measures

IPV and maltreatment. The Family Background Questionnaire (FBQ; McGee, Wolfe, & Wilson, 1997) was used at Time 1 in this study to measure both IPV and maltreatment. The FBQ is a self-report version of the Record of Maltreatment Experiences-Revised (ROME; McGee, Wolfe, Yuen, & Wilson, 1995; Wolfe & McGee, 1994) that was developed to measure lifetime experiences of maltreatment by mothers and fathers. In the current study, FBQ items were used to measure three types of child maltreatment: exposure to IPV perpetrated between caregivers and their partners, and exposure to physical and psychological abuse perpetrated toward the child by their caregivers. Girls rated the frequency of exposure to each

maltreatment experience perpetrated by mothers and fathers separately on a 4-point scale ranging from 1 (*never*) to 4 (*happened often or very often*). The IPV scale was assessed with four items, including the following: “pushed, grabbed, or shoved his/her partner”; “threw something at his/her partner”; “beat up her/his partner”; and “threatened her/his partner with a gun” ($\alpha = .82$ and $.89$ for mothers and fathers, respectively). Exposure to physical abuse perpetrated by the caregiver toward the child was measured using three items, including the following: “spanked you very strongly”; “hit, kicked or punched you”; and “threw you against something” ($\alpha = .73$ and $.82$ for mothers and fathers, respectively). Exposure to psychological abuse perpetrated by the caregiver toward the child was assessed with eight items. Sample items were as follows: “threatened to abandon you or have you taken away”; “insulted you (for example, called you stupid, lazy, worthless)”; “destroyed or threatened to destroy something you valued”; and “called you names (for example, slut or bastard)” ($\alpha = .83$ and $.87$ for mothers and fathers, respectively). Two latent variables were calculated for maternal and paternal abuse. These latent variables consisted of the calculated maternal/paternal physical abuse and psychological abuse scales to assess the unique contribution of IPV versus other forms of maltreatment in determining outcomes.

Rejection sensitivity. Rejection sensitivity was assessed at Time 1 and Time 2 using the Rejection Sensitivity Questionnaire-Revised (RSQ-R). This measure was closely adapted from the Children’s RS Questionnaire (Downey, Lebolt, Rincón, & Freitas, 1998) to be developmentally salient for adolescents. The RSQ-R consists of six hypothetical situations in which rejection by a close friend and romantic partner is possible (e.g., “Your close friend has plans to go out with another group of people but you would rather go out alone with him/her”). For each situation, participants are asked to indicate both their degree of *anger* and *anxiousness* about a possible negative outcome (e.g., “How angry would you be imagining that he or she would not be willing choose to stay with you?”), on a 4-point scale ranging from 1 (*not at all*) to 4 (*extremely*). Items are summed to create *angry rejection sensitivity* and an *anxious rejection sensitivity* subscale score. The angry rejection sensitivity (RSA) subscale score was used in this study ($\alpha = .71$ and $.81$ at Time 1 and Time 2, respectively).

Romantic partner aggression. Aggression perpetrated toward romantic partners was measured

using both the Conflict Tactics Scale (CTS; Straus, 1979) and the Conflict Tactics Scale-Revised (CTS2; Straus, Hamby, Boney-McCoy, & Sugarman, 1996). The CTS is a broadly used questionnaire that assesses violence and aggression within relationships. A modified version of the CTS (D. Pepler, personal communication, March 15, 2004) was used at Time 1 to assess youth perpetration of violence across several relationships including mother, father, peer and romantic partner relationships. The current study utilized data on girls’ aggression toward their romantic partners measured by items such as “you destroyed or threatened to destroy something that was valued by a romantic partner” and “you pushed, grabbed, or shoved your romantic partner in an argument.” Participants were asked to rate seven items on a 4-point scale ranging from 1 (*never*) to 4 (*always*) to indicate to what extent they had engaged in violence within the previous 6 months. Acceptable internal consistency was demonstrated at Time 1 ($\alpha = .92$).

The CTS2 measures victimization and perpetration of physical assault and psychological aggression in dating, cohabiting or married relationships. In this study, the physical assault and psychological aggression subscales were used to assess violence toward romantic partners in early adulthood (Time 2). The 12-item physical assault scale included items such as “twisted your partner’s arm or hair” and “pushed or shoved your partner”; the eight-item psychological aggression scale included items such as “called your partner fat or ugly” and “did something to spite the other.” Participants were asked to indicate the frequency of perpetrating such acts within the past 6 months on a 7-point scale ranging from 1 (*never*) to 7 (*more than 20 times*). Internal consistencies for the physical assault and psychological aggression subscales were $\alpha = .78$ and $\alpha = .79$, respectively.

RESULTS

Missing Data and Imputation

The percentage of missingness across all 139 participants and all variables included in the study was 18.7%. Patterns of missing data were examined using the Little MCAR test in SPSS version 19.0. Our analyses suggested that missing data in this study was missing completely at random (MCAR). Using the Multiple Imputation module in LISREL 8.7 (Jöreskog & Sörbom, 2004), we imputed values for all variables with missing values. Data were imputed using the EM algorithm, with number of iterations and convergence criterion set to 200 and

0.00001, respectively. We were able to impute missing values for all but one variable for which there was no variability in the response on the nonmissing data. For this variable, we replaced all missing values with the same nonvariable response. All subsequent analyses were conducted on the fully imputed data set.

Statistical Analysis

Means and standard deviations for all variables, as well as correlations between age, exposure to maternal and paternal IPV, RSA in adolescence and in early adulthood, and dependent variables, are presented in Table 1. Age was not significantly related to any of the predictor or dependent variables, and its further treatment in analyses is discussed below.

Prospective and mediated relationships were tested within a structural equation model (SEM) framework using AMOS version 19.0 (Arbuckle, 2006). SEM uses a confirmatory approach to data analysis in which the expected set of relationships between latent and/or observed variables can be specified a priori and modeled simultaneously. Models were evaluated according to the most commonly used critical values for the fit indices. Chi-square is a discrepancy function and represents the differences between the observed covariance matrix and the predicted covariance matrix. A nonsignificant chi-square is regarded as an acceptable model for samples under 200, such that the observed covariance matrix is similar to the predicted matrix. If the chi-square statistic is significant

(indicating a poor fitting model), other fit indices are not interpreted. The chi-square statistic was also used in this study to compare nested models in order to assess whether the addition of relationships within a parsimonious model significantly changed the model fit (Kenny, 2012). The root mean square error of approximation (RMSEA) is a parsimony-adjusted index that favors a parsimonious model. A RMSEA below .05 indicates a close fit to the data and is acceptable if it is below .06 (Hu & Bentler, 1999). The Tucker-Lewis Index (TLI) is one of the most commonly used incremental fit indices and is less influenced by large sample sizes (i.e., over 200) than the chi-square. The TLI attempts to assess the improvement of the proposed model to the null model, where all relationships are assumed to be 0. A value of over .9 is assumed to reflect a good fit to the data (Hu & Bentler, 1999).

Where possible, latent variables were created by taking the means of two or more items starting with the highest- and the lowest-loading items and moving inward (Little, Cunningham, Shahar, & Windaman, 2002). Item parcels provide better estimates of constructs with low sample sizes as they allow for measurement error to be accounted for while minimizing the impact on power (Little et al., 2002). Item parcel parameters were set to be equal, so that each parcel loaded equally onto the latent variable. This means that parcel parameters were not estimated, reducing the impact of latent variables on power. These procedures are appropriate when sample size is limited and primary hypotheses concern the relationships among latent

TABLE 1
Correlations, Means, and Standard Deviations for Maternal and Paternal Maltreatment, RSA, and Girls' Perpetration of Romantic Partner Aggression

	1	2	3	4	5	6	7	8	9	10	11
1. Maternal IPV											
2. Paternal IPV	.58***										
3. Maternal psych abuse	.44***	.30***									
4. Paternal psych abuse	.42***	.64***	.39***								
5. Maternal physical abuse	.33***	.19*	.69***	.24**							
6. Paternal physical abuse	.34***	.59***	.30**	.78***	.32***						
7. Time 1 RSA	.20*	.07	.14	.06	.10	.04					
8. Time 2 RSA	-.01	.02	.02	.03	-.01	.05	.25**				
9. Time 1 RP aggression	.23**	.10	.28**	.23*	.11	.19*	.31**	.04			
10. Time 2 RP physical assault	.27**	.22*	.07	.22*	.03	.06	.11	.17*	.20*		
11. Time 2 RP psych aggression	.21*	.16	.04	.26**	-.10	.03	.05	.13	.17*	.67**	
<i>M</i>	1.37	1.50	1.63	1.72	1.54	1.61	2.31	2.33	12.40	27.66	51.28
<i>SD</i>	0.64	0.82	0.65	0.78	0.73	0.89	0.57	0.63	5.42	23.24	35.84

Note. IPV, interparental violence; psych, psychological; RSA, rejection sensitivity anger; RP, romantic partner.

* $p < .05$; ** $p < .01$; *** $p < .001$.

variables rather than a measurement model (Kenny, 2012). This procedure was used to create latent variables with the exception of maternal and paternal IPV, as these scales consist of four items each and therefore consist of too few items to be parceled. In this case, item parceling was not used and items were loaded onto the latent construct without constraining the parameters to be equal.

Age at entry into the study was included as a covariate in all path models to control for potential age effects. However, because age was uncorrelated with all the variables in the model, this was adjusted for in the models and the regression weight was set to zero.

Is Maternal IPV Related to RSA and Partner Aggression Concurrently and Prospectively?

To test whether rejection sensitivity anger (RSA) mediated the relationship between maternal IPV and perpetration of romantic partner aggression in adolescence (Time 1), a concurrent mediation model was developed (see Figure 1). This model fit the data well ($\chi^2(46) = 56.39$, $p = .12$; TLI = .98; RMSEA = .04). Paths between maternal IPV and RSA ($\beta = .26$, $p = .01$) and RSA and perpetration of romantic partner aggression ($\beta = .35$, $p < .001$) were both significant, confirming our predictions that exposure to IPV is associated with higher sensitivity to rejection and in turn to increased risk of aggression toward romantic partners. Importantly, despite a significant zero-order correlation between maternal IPV and romantic partner aggression ($r = .23$), the path between these two variables was not significant ($\beta = .14$, $p = .15$) with RSA included in the model. These findings suggest that as predicted, the relationship of maternal IPV with aggression toward romantic partners was mediated through RSA, which we confirmed with a Sobel test ($z_{\text{sobel}} = 2.03$, $p = .05$).

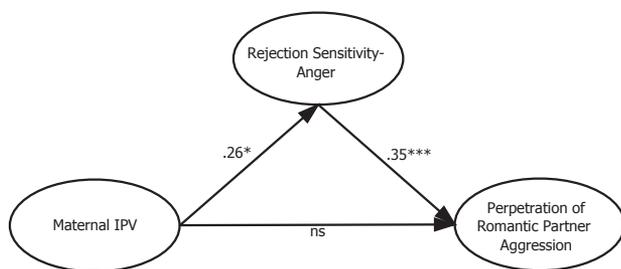


FIGURE 1 Time 1 maternal IPV, RSA, and perpetration of romantic partner aggression in adolescence. ns = non significant, * $p < .05$, *** $p < .001$

To assess relationships longitudinally, a SEM was created in which the effects of maternal IPV on aggression toward partners were carried from RSA at Time 1 to RSA at Time 2. When predicting perpetration of romantic partner physical assault in early adulthood, this model fit the data well ($\chi^2(79) = 100.16$, $p = .06$; TLI = .97; RMSEA = .04; see Figure 2). Maternal IPV was related to RSA at Time 1 ($\beta = .25$, $p = .01$), which in turn was related to RSA at Time 2 ($\beta = .30$, $p = .002$). Further, there was a trend for RSA at Time 2 to increase risk of perpetration of romantic partner physical assault at Time 2 ($\beta = .17$, $p = .06$). However, the relationship between maternal IPV and perpetration of romantic partner physical assault did not appear to be mediated through RSA at Time 1 and Time 2, as the direct relationship between maternal IPV and romantic partner physical assault remained significant ($\beta = .29$, $p = .001$). To further test for mediation, we compared the regression weights between IPV and romantic partner physical assault before and after we included RSA at Time 1 and Time 2 in the model. No change was noted, once again suggesting that the model is not mediated by RSA. Consistent with this conclusion, we also found that model fit was significantly better when the relationship between maternal IPV and perpetration of romantic partner physical assault at Time 2 was included versus omitted from the model ($\Delta\chi^2(1) = 10$, $p < .01$).

The same longitudinal model was applied to predicting perpetration of romantic partner psychological aggression at Time 2 (see Figure 3). This model fit the data well ($\chi^2(82) = 93.58$, $p = .18$; TLI = .98; RMSEA = .03) and confirmed the same set of relationships between maternal IPV and RSA as found and noted above with respect to physical assault. Specifically, maternal IPV was significantly related to RSA at Time 1 ($\beta = .25$, $p = .02$), which in turn was related to RSA at Time 2 ($\beta = .33$, $p = .002$). A trend emerged indicating that RSA at Time 2 was related to psychological aggression toward romantic partners ($\beta = .17$, $p = .09$). Maternal IPV remained directly related to romantic partner psychological aggression at Time 2 ($\beta = .27$, $p = .005$). To test for mediation, we compared the regression weights between maternal IPV and romantic partner psychological aggression before and after we included RSA at Time 1 and Time 2 in the model. No change was noted, suggesting that the model is not mediated by RSA. Consistent with this conclusion, significantly better fit was observed when the relationship between maternal IPV and perpetration of romantic partner psycho-

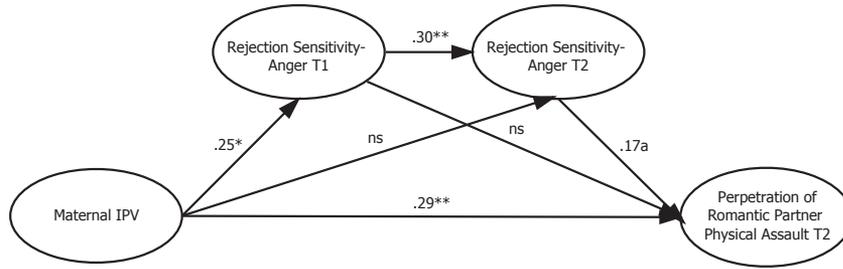


FIGURE 2 Time 2 maternal IPV, RSA, and perpetration of romantic partner physical assault. $ap = .09$, $*p < .05$, $**p < .01$

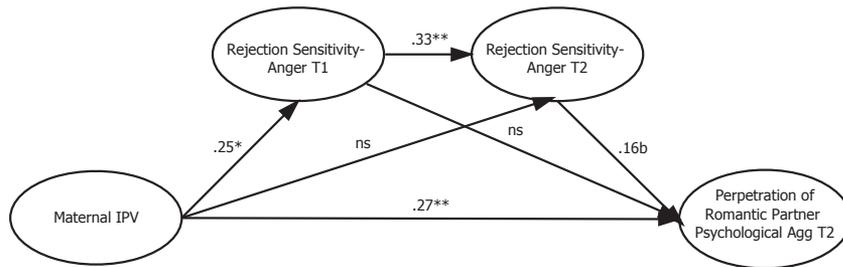


FIGURE 3 Time 2 maternal IPV, RSA, and perpetration of romantic partner psychological aggression. $bp = .09$, $*p < .05$, $**p < .01$

logical aggression was included versus excluded from the model ($\Delta\chi^2(1) = 7.7$, $p = .01$).

Is Paternal IPV Related to RSA and Partner Aggression Concurrently and Prospectively?

A comparable model tested the relationship between paternal IPV and perpetration of romantic partner aggression at Time 1 and Time 2. The model indices did not indicate a uniformly good fit for Time 1 ($\chi^2(32) = 52.0$, $p < .05$, $TLI = .97$, $RMSEA = .06$) or Time 2 perpetration of physical assault ($\chi^2(79) = 109.17$, $p = .01$, $TLI = .96$, $RMSEA = .05$). More importantly, paternal IPV was not significantly related to RSA at Time 1 ($\beta = .06$, $p = .51$), RSA at Time 2 ($\beta = -.05$, $p = .62$), perpetration of romantic partner aggression at Time 1 ($\beta = .03$, $p = .73$), and perpetration of romantic partner physical assault at Time 2 ($\beta = .15$, $p = .10$).

In contrast, the longitudinal mediation model for paternal IPV on perpetration of romantic partner psychological aggression had an acceptable fit ($\chi^2(81) = 87.93$, $p = .28$; $TLI = .99$; $RMSEA = .03$). Paternal IPV was related to perpetration of romantic partner psychological aggression ($\beta = .20$, $p = .03$). However, paternal IPV was not related to RSA at Time 1 ($\beta = .06$, $p = .51$) or RSA at Time 2 ($\beta = -.05$, $p = .62$), suggesting that the impact of paternal IPV was direct rather than mediated through RSA and restricted to perpetration of psy-

chological aggression toward romantic partners in young adulthood.

Are the Effects of Maternal IPV Due to Co-occurring Paternal IPV?

To assess whether our findings on the impact of maternal IPV were due to concurrent paternal IPV, we added paternal IPV as a covariate to the maternal IPV model in a nested model. These additional analyses concluded that the effect of maternal IPV on RSA and perpetration of romantic partner aggression was not due to co-occurring paternal IPV (Time 1 $\Delta\chi^2(2) = 3.38$, $p = .19$). These findings were replicated across our longitudinal models as well, for both Time 2 perpetration of physical assault ($\Delta\chi^2(2) = 2.09$, $p = .35$) and Time 2 perpetration of psychological aggression ($\Delta\chi^2(2) = 1.51$, $p = .47$). Furthermore, maternal IPV regression weights did not significantly change across any of the three models including paternal IPV as a predictor of partner aggression, and path coefficients for paternal IPV were not predictive of RSA or aggression toward romantic partners in any of the models we evaluated. Lastly, the significant relationship originally observed between paternal IPV and romantic partner psychological aggression at Time 2 in our longitudinal model testing paternal IPV alone was no longer significant ($p = .92$) when maternal

IPV was accounted for. These results rule out the possibility that effects noted for exposure to maternal IPV in this study are due to co-occurring paternal IPV.

Are the Effects of Maternal IPV Due to Other Forms of Maternal and Paternal Maltreatment?

An important question to address is whether the effects we observed for exposure to maternal IPV were due to the unique impact of IPV versus other frequently co-occurring forms of maternal or paternal maltreatment. To conserve power, maternal and paternal latent variables were created based on the physical and psychological abuse scales and used to determine the unique contributions of maternal IPV in the models. Similar to analyses for co-occurring paternal IPV, nested models were used to examine this question. Results showed that while accounting for the correlation with other forms of maltreatment, the effect of maternal IPV on RSA and perpetration of romantic partner aggression was not the result of other forms of maltreatment. This was observed both concurrently and longitudinally (Time 1 romantic partner aggression model [$\Delta\chi^2(4) = 6.53, p = .16$]; Time 2 romantic partner physical assault model [$\Delta\chi^2(6) = 2.72, p = .84$]; and Time 2 perpetration of romantic partner psychological aggression model [$\Delta\chi^2(6) = 6.95, p = .33$]). Maternal and paternal other maltreatment was only significantly correlated with maternal IPV and was not significantly related to RSA at Time 1 or 2 and perpetration of romantic partner aggression at Time 1 and physical assault or psychological assault at Time 2. Thus, the inclusion of other forms of maltreatment did not significantly affect the regression weights from maternal IPV to RSA or romantic partner aggression in both concurrent and longitudinal models. These results suggest that the effects of maternal IPV on risk of romantic partner aggression may be unique.

DISCUSSION

The current study examined the concurrent and prospective relationships between IPV exposure, RSA, and girls' aggression in romantic relationships. Building on previous studies, we explored a mediation model, reasoning that exposure to IPV would increase RSA, which in turn may predict partner violence. We compared the fit of this model for maternal versus paternal IPV and we also assessed whether the effects of exposure to IPV

were unique and separate from other forms of child maltreatment, most notably physical and psychological abuse.

Consistent with past research, we found that maternal IPV was significantly related to concurrent levels of RSA and aggression toward romantic partners during adolescence. In addition, we confirmed that RSA mediated the concurrent relationship between maternal IPV and romantic partner aggression. In other words, girls who witnessed their mothers' aggression toward her romantic partner experienced greater RS, and this tendency to perceive threat and to respond with angry feelings within interpersonal relationships increased their concurrent risk of romantic partner aggression.

The prospective impact of maternal IPV appeared more complex. We confirmed that maternal IPV exerted a significant direct effect on risk for both physical assault and psychological aggression toward romantic partners in early adulthood; however, this effect was not mediated through RSA. Instead, maternal IPV also exerted an indirect effect through RSA in adolescence and RSA in young adulthood. That is, witnessing maternal IPV was significantly associated with RSA in adolescence, which was in turn significantly associated with RSA in young adulthood. RSA in young adulthood was marginally related to both physical assault and psychological aggression toward romantic partners.

When we tested our mediation model for paternal IPV, we did not find comparable results concurrently or prospectively. The only significant relationship to emerge was a prospective association between paternal IPV and girls' psychological aggression toward their romantic partners in early adulthood. When we considered whether paternal IPV might account for the effects of maternal IPV by considering these jointly in our model, no further effects were noted for paternal IPV beyond its correlation with maternal IPV, with effects of maternal IPV on girls' romantic partner aggression remaining constant and significant. In fact, the association of paternal IPV with girls' psychological aggression toward partners that emerged when examining paternal IPV alone was no longer significant once maternal IPV and paternal IPV were jointly considered.

The effects of exposure to maternal IPV also appeared to be relatively distinct from the effects of other forms of maltreatment. When we added maternal and paternal physical and psychological maltreatment to our model, we did not find that

this altered the associations between maternal IPV and romantic partner aggression concurrently or prospectively.

These results add to growing evidence that maternal IPV plays an important role in shaping daughters' use of aggression in intimate relationships. Such findings are consistent with Hendy et al. (2003) who concluded that maternal IPV is a potent factor in determining child aggressiveness because mothers more frequently serve as primary caregivers and role models for their children. It is also possible that the impact of maternal IPV is associated with attachment-related processes. Mothers are identified as primary attachment figures more frequently than fathers, and this preference extends from early childhood to early adulthood (Rosenthal & Kobak, 2010). As primary attachment figures, mothers play an important role in their children's acquisition of affect regulation skills, abilities that are critical in modulating feelings of anger in close relationships (Mikulincer, Shaver, & Pereg, 2003). Children exposed to family violence, particularly to maternal IPV, may learn implicit lessons on the use of aggression in attachment relationships, and they may also lag in the acquisition of self-regulatory skills that are essential to navigating conflict in close relationships (Moretti & Osbuth, 2011).

Our findings also support prior research demonstrating that exposure to IPV is associated with RSA. Specifically, girls' reports of exposure to maternal IPV were associated with RSA in adolescence, and, as predicted, RSA mediated the relationship between maternal IPV and romantic partner aggression. However, we did not find that RSA mediated aggression toward romantic partners in early adulthood; rather, maternal IPV exerted a direct effect on romantic partner aggression in early adulthood and a modest indirect effect through RSA in adolescence and to RSA subsequently in early adulthood. In other words, girls who observed their mothers' perpetration of aggression toward her romantic partner were at greater risk of developing expectations of rejection and associated feelings of anger in adolescence, and these beliefs predicted similar expectations and feelings in adulthood that in turn increased their risk of aggression toward their romantic partners.

Our findings did not reveal significant associations between paternal IPV and girls' aggression in romantic relationships, concurrently or prospectively. Although we predicted that maternal IPV might exert a stronger role than paternal IPV in this regard, we were surprised by the lack of significant associations between paternal IPV and

outcomes for girls. It is possible that our failure to detect such effects was due to the higher frequency with which girls nominated their biological mothers as their primary maternal figures (83.7%) versus their biological fathers as primary paternal figures (65.6%), yet estimates indicate that the majority of girls nominated their biological mother or father as primary figures. Furthermore, the vast majority of other paternal caregivers nominated by girls reflected relatively stable caregivers, including adoptive fathers, grandfathers, or stepfathers. Nonetheless, it is possible that the effects of maternal and paternal IPV vary depending on the stability of the relationship of children to their caregivers.

It is also likely that the effects of maternal and paternal IPV are complex and not easily understood in studies such as ours where attempts are made to parse variance between perpetrators. IPV typically involves both partners and is frequently accompanied by other forms of child maltreatment. Although we demonstrated that the effects of maternal IPV remained unique and unchanged while considering other forms of child maltreatment, notably maternal and paternal physical and psychological maltreatment, we were hampered in examining the complex interactions between various forms of child maltreatment over time. Continued efforts are required to understand the complex interactions that determine the impact of maltreatment on children's development.

Additional caveats must be kept in mind. First and foremost, the current study examined only the perpetration of aggression in romantic relationships but not experiences of victimization. Perpetration and victimization often go hand-in-hand, thus examining one side of the coin without looking at the other is inherently limited. Unquestionably, children learn about both perpetration and victimization when they are exposed to IPV. More specifically, girls in the current study who were exposed to maternal IPV learned not only about using aggression toward romantic partners, they also learned about victimization within romantic relationships (Hendy et al., 2003). Future research examining both aspects of risk transmission is essential in clarifying the full impact of maternal and paternal IPV on girls' risk of perpetration and victimization.

Second, the current study examined gender-linked transmission only with respect to the effects of exposure to maternal versus paternal IPV on daughters. This constitutes only a partial test of a gender-linked transmission model as boys were not included in the current study. As we noted earlier,

previous research (Fritz, Slep, & O'Leary, 2012; Hendy et al., 2003; Moretti et al., 2006) shows that maternal aggression may be linked to daughters' and sons' perpetration of aggression in romantic relationships and our current results offer no evidence to the contrary.

Third, the current study relied on girls' self-reports in measuring exposure to parental IPV and girls' perpetration of aggression in romantic relationships. One may argue that self-reports access privileged information about these factors that may not be available through reports from family members, romantic partners, or observers' ratings. However, alternative sources of information should be included in future research to determine whether this is indeed the case.

Fourth, our sample size limited our use of advanced statistical techniques such that we maximized power using item parcels rather than including measurement models. This method is considered statistically sound when researchers are interested in the relationship between latent variables rather than the factor analysis of each latent variable (Kenny, 2012; Little et al., 2002); however, a larger sample size would allow for proper measurement models in addition to the examination of the relationships between latent variables. In addition, the use of item parcels in a SEM model is considered superior to path analysis models in that it takes into account measurement error of psychological self-report measures. Due to our use of multiple imputation for missing data, we were limited to the use of a Sobel test to test for mediation. The Sobel test uses a normal approximation falsely assuming a symmetric distribution, which means it is a very conservative test of mediation and therefore has a low power to detect indirect effects.

Finally, girls in the current study were drawn from a juvenile detention center. This sample was selected as it represents a population where girls are at highly elevated risk for aggression toward their partners. Studies using similar populations reveal that girls involved in the juvenile justice system suffer from far greater rates of mental health problems and exposure to maltreatment and other forms of trauma (Cauffman, Lexcen, Goldweber, Shulman, & Grisso, 2007; Dixon, Howie, & Starling, 2004; Moretti, Odgers, Reppucci, The Gender and Aggression Project Team, & Catherine, 2011) than community samples. Further research using other populations is needed to better understand the relationship between exposure to maternal versus paternal IPV and girls' risk for aggression in romantic relationships.

Notwithstanding these limitations, the current findings point to important prevention and risk-reduction targets. As we have argued elsewhere (Moretti, Jackson, & Osbuth, 2010), it is painfully obvious that preventing childhood maltreatment, such as exposure to family violence, is critical in the prevention of aggression in children and adults. Yet, even the best prevention programs will not result in the complete eradication of family violence and its deleterious effects on child development. Our results suggest two important targets for risk reduction. First, supporting mothers in the context of IPV may very well offer important benefits for their daughters. Family therapy and/or individual therapy for parents may have trickle-down effects including diminution in risk transmission from parents to offspring. Girls' RSA is also an important risk-reduction target through interventions such as cognitive behavioral or dialectical behavior therapy that may help girls to become aware of how their family experiences may drive interpretations of interpersonal experiences and behavior in intimate relationships and to provide support in enhancing affect regulation and interpersonal functioning. Finally, girls who have experienced family violence in their family of origin will likely benefit from preventative interventions that increase their awareness of relationship violence and healthy relationship alternatives. Such interventions offer promise of reducing risk for their children and ultimately breaking the cycle of abuse.

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