

behavioral problems: providing a lens that magnifies the processes underlying these effects. In particular, researchers and clinicians have concerned themselves with the question of whether exposure to physical IPV increases aggression during childhood and adolescence, and later in young adulthood as offspring enter into romantic relationships. There is a substantial body of evidence that supports the association between IPV and aggression, both concurrently and prospectively. For example, Baldry [2003] found that exposure to IPV was associated with direct bullying of peers. Adolescent boys exposed to IPV have been found to hold beliefs that are congruent with the use of aggression in romantic relationships and engage in more aggressive behaviors with their partners [e.g., Kinsfogel and Grych, 2004]. Similarly, Chen and White [2004] found that parental fighting predicted future engagement in intimate partner violence in young men but not young women.

While several studies have examined sex differences in the effects of exposure to IPV [see Kitzmann et al., 2003 and Wolfe et al., 2003 for reviews], few have examined whether there are similar effects when IPV is perpetrated by mothers vs. fathers. One exception is a study by Fergusson and Horwood [1998] examining retrospective data from over 1,200 children born in Christchurch, New Zealand. Self-reports at age 18 of exposure to IPV during childhood were examined in relation to psychiatric diagnoses, substance use, and youth criminal offending between ages 16 and 18 years of age. Aggression by fathers toward their partners predicted criminal offending, among other problems, but mother-perpetrated IPV was not a significant factor in predicting maladjustment. Sex differences were not observed; however, the study failed to examine specific effects of exposure to maternal vs. paternal IPV on children's use of aggression and violence in their relationships.

A different pattern of finding emerged in Ulman and Straus's [2003] study of exposure to parental IPV and child-to-parent violence in over 2,000 families with children between the ages of 3 and 17 from the 1975 National Family Violence Survey. They found that violence between parents was strongly related to children hitting mothers but not fathers. Interestingly, however, children who observed *only* their mothers engaging in violence toward their father were more aggressive toward mothers than were children who observed only their fathers aggress toward their mothers or violence between both parents. In another study, Jankowski et al. [1999] found evidence of a "same-sex modeling

effect": young adults who observed only their same-sex parent engage in physical aggression toward their marital partner were at higher risk of being physically aggressive with their romantic partners while those who observed only their opposite-sex parent engage in physical aggression were not. However, due to sample limitations, they did not complete analyses of sex differences in these effects and therefore it is difficult to conclude that girls and boys were influenced differently by witnessing mother vs. father violence. Although these studies have a considerable advantage over the present study in that they involved large community samples and some were longitudinal, the incongruence across findings leaves the question of differential effects of paternal and maternal IPV on adolescents' aggression open.

Social learning theory [Bandura, 1973] suggests that parental modeling of aggressive behaviors underlies the relations between exposure to IPV and aggressive behavior in children. This effect may be general; for example, engagement in IPV by either parent may increase aggressive behavior in both boys and girls. Alternatively, IPV may have partial or full effects which are sex-specific; that is, maternal perpetration of IPV may have stronger effects on daughters than sons and paternal perpetration of IPV may have stronger effects on sons vs. daughters. The current study extends previous research by testing for unique relations between exposure to physical IPV perpetrated by mothers vs. fathers and interpersonal aggression in adolescent daughters vs. sons. In light of Kitzmann et al.'s [2003] finding that exposure to physical aggression and violence by parents has more profound negative consequences than exposure to verbal aggression, we specifically focused on witnessing physical aggression and violence by parents and its relation to adolescents' perpetration of similar behavior. This study also extends the examination of adolescents' involvement in aggression across multiple relationships (mothers, fathers, friends, and romantic partners) that have been investigated separately in previous studies. This strategy allowed us to identify the relations between witnessing a specific form of serious aggression, namely physical IPV perpetrated by either mothers or fathers, and the likelihood of adolescents engaging in comparable behaviors. In addition, we were able to isolate the extent to which the relations between mother vs. father IPV and sons' and daughters' aggression generalized across relationship contexts.

Recent studies have also pointed to the fact that some psychological processes may mediate or

moderate the relation between exposure to IPV and aggressive behavior. Of particular interest is the potentially mediating or moderating role of post-traumatic stress disorder (PTSD) on the relation between exposure to IPV and aggression. Research shows that children exposed to IPV are at higher risk for PTSD [Kitzmann et al., 2003; Margolin and Gordis, 2000; Wolfe et al., 2003]. PTSD symptoms, such as intrusive memories and hypervigilance, may alter responses to parental IPV or associated cues by increasing maladaptive and chronic cognitive and behavioral reactions [Meiser-Stedman, 2002]. Recent studies provide evidence of the significance of PTSD in mediating the relation between maltreatment and aggression: Wekerle et al. [2001] found that PTSD mediated the relation between maltreatment experiences and dating violence (both as a perpetrator and victim) in girls but not boys. In a subsequent study, prospectively examining dating violence over a 1-year period, trauma symptoms were found to mediate the relation between child maltreatment and dating violence for both girls and boys [Wolfe et al., 2004].

The current study extends previous research by examining the role of PTSD in the relation between exposure to physical IPV perpetrated by mothers vs. fathers with youths' aggression within interpersonal relationships. In contrast to previous research however, we propose that PTSD moderates rather than mediates the relation between exposure to IPV and interpersonal aggression; that is, we predicted that relations between IPV and relationship violence would be stronger among youth diagnosed with PTSD than those not diagnosed. This prediction assumes that the symptoms of PTSD (e.g., re-experiencing, hyperarousal) intensify (i.e., moderate) emotional distress and behavioral dysregulation when youth encounter stressful events, such as exposure to IPV. Even in the absence of PTSD symptoms, however, exposure to IPV may still be related to youth aggression as a function of other processes such as modeling and deficits in emotion regulation and social skills.

Prior evidence [e.g., Kilpatrick et al., 2003] suggests that the prevalence of PTSD is higher among girls than it is among boys. As such, we expected that a higher percentage of girls than boys would be diagnosed with PTSD. As previously summarized, research on sex differences in the impact of PTSD on the relation between parental IPV and aggression has produced inconsistent findings. We know of no strong theoretical reason to believe that sex differences should exist in this

domain, and in light of equivocal findings of past work, we made no predictions of sex differences.

To summarize, the current study extends previous research by examining the specificity of relations between exposure to maternal vs. paternal physical IPV and aggression in adolescent girls vs. boys. We assessed whether mothers' perpetration of IPV was more strongly related to girls' rather than boys' aggression, and fathers' perpetration of IPV was more strongly related to boys' rather than girls' aggression, or if parental modeling of violence was related to increased aggression in *both* adolescent girls and boys. Further, we examined interpersonal violence across four relationship domains: aggression toward mothers, fathers, friends, and romantic partner. Finally, we predicted that the relations between exposure to IPV and aggressive behavior for both girls and boys across relationships would be stronger among youth who met diagnostic criteria for PTSD.

METHOD

Participants

Participants were 112 (63 girls and 49 boys) adolescents drawn from consecutive referrals to a provincial center for assessment of severe behavior problems ($N = 51$) and admissions to youth correctional facilities ($N = 61$) in the greater Vancouver area.¹ Youths ranged in age from 13 to 18 years ($M = 15.4$ years, $SD = 1.4$). Preliminary analyses on all variables were completed to ensure comparability of results across referral sources. The sample was primarily Euro-Caucasian (67%); 22% were of Aboriginal descent, and one was African American. The remaining 13 participants identified with more than one ethnic group. Demographic data on living conditions revealed that the majority of girls (89%) and boys (92%) lived with two parental figures. On average, girls reported living with two parental figures for 7.8 years ($SD = 4.86$) while boys reported living with two parental figures for 9.1 years ($SD = 5.03$). This difference between boys and girls was not significantly different.

Procedure

Youths (with $IQ > 70$ as assessed by the WISC-III or WISC-IV; Wechsler, 1991 or 2003) were approached to participate in the study within 2 weeks of their referral or admission to each facility.

¹This research is part of a larger multi-site study of gender and aggression led by M. Moretti and funded by a Canadian Institute for Health Research (CIHR) New Emerging Team research grant. Results presented here include data from Wave I—Vancouver site.

Confidentiality was fully explained, and informed consent was obtained from youths and parents or alternative legal guardians. Participants completed interviews and questionnaire packages across several individual testing sessions to reduce fatigue and improve the validity of responses. All data were collected with the support of a trained graduate student research assistant. Participants received a \$30 honorarium or a gift certificate.

Measures

The *Family Background Questionnaire* [McGee et al., 1997] is an established measure [e.g., Melchert, 1998] of maltreatment experienced during childhood across five domains: exposure to IPV, emotional, physical and sexual abuse, and neglect. Youth completed each of the items based on their victimization experiences with a maternal and a paternal figure (subscales $\alpha = .73-.86$). Exposure to maternal and paternal violence was assessed using a four-item subscale (“Beat up his/her partner”, “Threw something at his/her partner”, “Threatened his/her partner with a gun”, and “Pushed, grabbed or shoved his/her partner”); maternal IPV subscale $\alpha = .76$ and paternal IPV subscale $\alpha = .81$). Each item was rated on a scale from 0 (it never happened) to 3 (it happened often or very often).

The *Conflict Tactics Scale* [CTS; Straus, 1979] is a broadly used questionnaire that assesses violence and aggression within relationships. In the current study, a modified version of the CTS [Pepler, 2004 personal communication; Straus, 1990] was used to assess youth perpetration of violence toward their mother, father, friend, and romantic partner within the past 6 months. The following six items were rated by youth on a four-point scale from 1 (never) to 4 (always) for each of the four relationship domains (subscales $\alpha = .82-.89$): “You destroyed or threatened to destroy something that was valued by a friend”, “You pushed, grabbed, or shoved a friend in an argument”, “You threw something at a friend”, “You slapped a friend”, and “You kicked, bit, or hit a friend”.

The *Diagnostic Interview for Children and Adolescents-IV* [DICA-IV, Adolescent version; Reich et al., 1997] was administered to youth by trained graduate research assistants. The DICA is a well-validated, structured, computer-assisted interview that assesses DSM-IV criteria for major psychiatric syndromes. Standard symptom criteria were applied in determining the presence of PTSD (DSM-IV-TR, APA, 1994) with the exception of requiring youth to confirm the impact of symptoms on functioning (i.e.,

criteria F) due to their limited capacity to do so. Comprehension of the questions was carefully assessed and all participants were considered competent to complete the diagnostic interview.

RESULTS

Level of IPV Exposure and Perpetration of Aggression by Girls and Boys

Mean levels and standard deviations of exposure to IPV and perpetration of violence across relationships are summarized separately for boys and girls in Table I. Although boys and girls did not differ in their reported exposure to IPV perpetrated by their fathers, girls reported higher levels of exposure to maternal perpetrated IPV ($t(101) = 2.68, P = .008$). The frequency with which girls and boys reported observing their parents engage in aggression toward their partners provides further illustration of these findings. For example, 36% of girls compared to 17% of boys reported that their mother “threw something at her partner” at least a few times, and 17% of girls but none of the boys reported that their mother has “beaten up her partner” at least a few times. In contrast, 42% of girls and 19% of boys reported that their father “threw something at his partner” at least a few times but 36% of girls and 19% of boys reported that their father “beat up his partner” at least a few times suggesting that a general trend toward greater maternal than paternal violence was only present for acts of lesser severity (Straus, 1990).

Boys and girls did not differ in their reports of physical aggression toward their mothers or fathers; however, boys reported engaging in significantly more physical aggression toward friends ($t(100) = 2.56, P = .012$), and girls reported engaging in significantly more physical aggression toward their romantic partners ($t(85) = 3.03, P = .003$). These sex differences were also reflected in the frequency with which boys and girls reported to engage in specific aggressive acts. For example, 73% of boys compared to 35% of girls reported to have “pushed, grabbed, or shoved a friend in an argument” at least once during the past 6 months. Similarly, 57% of boys compared to 38% of girls reported to have “kicked, bit, or hit a friend” at least once. We did not specifically ask participants about opposite-sex friends; however, it is likely that their answers reflect aggression in same-sex rather than opposite-sex relationships [Archer, 2004]. Our finding that boys report higher levels of aggression in their friendship than do girls is consistent with Archer’s [2004] recent meta-analysis of sex

TABLE I. Aggressive Behavior Variables: Summary Statistics and Inter-Correlations for Boys and Girls

		FBQ mother	FBQ father	CTS mother	CTS father	CTS friend	CTS romantic partner
Girls	Mean	1.76 _b	1.75 _a	8.04 _a	6.77 _a	8.00 _b	8.13 _b
	SD	2.84	2.90	3.60	1.49	2.10	2.99
	FBQ mother						
	FBQ father	.28*					
	CTS mother	.25	.26				
	CTS father	.19	.40**	.11			
	CTS friend	.35**	.27	.30*	.38**		
	CTS romantic partner	.30*	.15	.35**	.16	.23	
Boys	Mean	.11 _a	.29 _a	7.08 _a	7.03 _a	9.33 _a	6.72 _a
	SD	.28	.66	1.57	2.32	3.24	1.16
	FBQ mother						
	FBQ father	.48**					
	CTS mother	.07	-.07				
	CTS father	.06	.28	.67**			
	CTS friend	.01	.39**	.27	.29*		
	CTS romantic partner	.58**	.31	.03	.04	.11	

Note: FBQ = Family Background Questionnaire (scale from 0 to 3); CTS = Conflict Tactics Scale (sum of Physical Aggression scales, scale from 1 to 4), *N*'s range from 40 to 55. Means with different subscripts differ significantly at $P < .01$.

* $P < .05$.

** $P < .01$.

FBQ father—exposure to violence by father toward mother; FBQ mother—exposure to violence by mother toward father; CTS mother—aggression toward mother; CTS father—aggression toward father; CTS friend—aggression toward friend; CTS romantic partner—aggression toward romantic partner.

differences in this regard. On the other hand, girls not only reported a higher frequency of aggression toward romantic partners than did boys, but reported having engaged in more of the severe aggressive acts [Straus, 1990] against these partners. For example, 34% of girls as compared to 2.6% of boys reported to have “kicked, bitten, or hit a romantic partner” at least once. Similarly, 18.8% of girls but no boys reported having hit their romantic partner with an object.

Traumatic Events and PTSD

When probed in an interview for exposure to frightening and life-threatening events, 26% of all participants reported experiencing serious physical assault, 23% had witnessed someone die, and 18% had experienced sexual assault. Less common events included vehicle accidents (11%), feared or actual abandonment (7%), fearing for one's own life (5%), having been bitten by a dog, having been in a fire, and having badly hurt someone by accident (one person each). Girls ($n = 15$, 23%) were significantly more likely than boys ($n = 2$, 6%) to have experienced sexual assault, $\chi^2(1, N = 112) = 8.96$, $P = .001$. No other sex differences were found.

Approximately one third (35%) of our sample met full PTSD criteria, a proportion that is comparable to studies of comparable clinical adolescent samples [e.g., Steiner and Cauffman, 1998; Stewart et al.,

2004]. Consistent with predictions, higher percentage of girls (46%, $n = 29$) than boys (22%, $n = 11$) met criteria for PTSD ($\chi^2(1, N = 112) = 5.68$, $P = .017$).

SEM Analyses of Relations between IPV and Adolescent's Aggression

The predicted relations between exposure to IPV and aggression across relationships were tested within a structural equation modeling (SEM) framework. SEM provides a confirmatory approach to data analysis in which the expected set of structural relations among variables can be specified a priori and modeled simultaneously. SEM also allows for a direct and empirical comparison of model parameters across groups (e.g., across males and females) through multiple group modeling. This strategy is particularly useful when testing for moderation of effects. All models were fit to the data using Mplus Version 3.1 [Muthén and Muthén, 2004] and AMOS Version 5.0 [Arbuckle, 2003]. Missing data were handled through the use of Full Information Maximum Likelihood Estimation.² Bentler [1988] suggests that acceptable parameters can be obtained

²While this method does not actually impute any data, it uses all available data points to construct the best possible first- and second-order moment estimates. It produces a vector of means and a covariance matrix that are model dependent and is considered to be one of the most robust and advanced methods of dealing with missing data (Arbuckle, 2003).

with a ratio of subjects to estimated parameters of at least 5:1. With these guidelines in mind, we tested only highly constrained models.

Figure 1 illustrates the general structural model that was fit to the data. The relations between IPV by father and IPV by mother with aggression were fit simultaneously (Parameters A and B, respectively), while controlling for the relation between mother and father IPV (Parameter C). Two sets of models were fit within this general framework. The first set of models was set up as a multiple group analysis where the relation between exposure to IPV and aggression could be examined by sex. Within this framework, the relations of IPV by mother and IPV by father with adolescent's aggression toward specific targets (mother, father, friend, and romantic partner) were assessed independently in four separate models. Next, the question of whether sex of adolescent moderates the relations between father IPV (A) and mother IPV (B) and aggression was assessed in each of the models. A series of nested models were fit to the data in which parameters "A" and/or "B" were constrained to be equal across males and females. Evidence of moderation existed if there was a significant increase in χ^2 units per degrees of freedom when a parameter was constrained across sex.

Moderation of Exposure to Maternal vs. Paternal IPV on Aggression by Sex

For girls, there was a positive relation between witnessing maternal IPV—parameter "B" in Figure

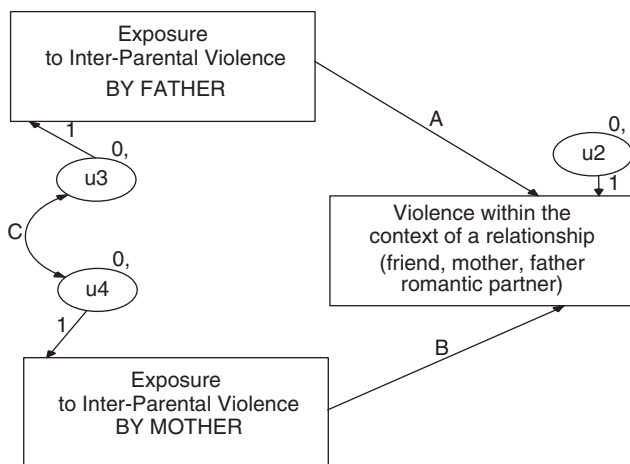


Fig. 1. SEM multi-group model illustrates the general structural model that was fit to the data. The relations between IPV by father and IPV by mother with aggression were modeled simultaneously (Parameters A and B, respectively), while controlling for the relations between mother and father IPV (Parameter C).

1—and levels of aggression toward friends ($\beta = .29$, $P = .03$) and romantic partners ($\beta = .26$, $P = .08$). However, there was no evidence that exposure to maternal IPV was related to aggression against fathers or mothers. Witnessing father's physical aggression toward his partner—parameter "A" in Figure 1—was strongly related to girls' aggression against fathers ($\beta = .35$, $P = .02$). However, witnessing father IPV was not related to girls' aggression toward mothers, friends, or romantic partners.

For boys, witnessing their mother's physical aggression toward her partner was related to aggression toward their romantic partner ($\beta = .53$, $P < .01$), but was not related to aggression toward friends or parents. Witnessing their father's violence toward his partner was associated with boys' aggression toward friends ($\beta = .50$, $P < .01$), but was not related to aggression toward fathers, mothers, or romantic partners.

In order to test whether the estimates of the relations between IPV and aggression for girls and boys were statistically different (i.e., moderated by sex), we fit a series of nested models. The results indicate that sex moderates the relation between IPV by father and aggression toward friends; that is, there was a significant loss in fit when we attempted to constrain the relation between paternal IPV and aggression toward friends to be equal across males and females ($\Delta\chi^2 = 4.7/\Delta df = 1$). This reflects our finding that paternal IPV was significantly related to aggression toward friends in boys but not girls. Evidence of moderation was not found, however, for any of the other estimates of IPV and aggression.

The Impact of PTSD on the Relation between Exposure to IPV and Aggression

In order to test whether a diagnosis of PTSD impacted the relations between IPV and aggression, we applied the same SEM procedure outlined above (and illustrated in Fig. 1). A series of SEM models were fit to the data in order to (1) estimate the parameters across PTSD and non-PTSD groups, and (2) statistically test whether the relations between exposure to IPV and aggression differed in PTSD vs. non-PTSD groups. Unfortunately, the low number of boys who met criteria for PTSD prevented us from statistically testing the impact of PTSD on the relation between exposure to IPV and aggression among boys. As such, results are presented first, for the entire sample and second, for girls only.

Results for the entire sample provide evidence that the relation between witnessing mothers engage in

violence toward their partners and engaging in aggression toward fathers was stronger for youth diagnosed with PTSD. Specifically, there was a strong positive relation between maternal IPV and aggression toward fathers for adolescents diagnosed with PTSD ($\beta = .51, P < .01$), while the relation for non-PTSD diagnosed youth was not significant ($\beta = -.07, P = \text{NS}$). There was a significant loss in fit between models ($\Delta\chi^2 = 5.3/\Delta df = 1$) when the relation between maternal IPV and aggression toward father was constrained to be equal across PTSD and non-PTSD diagnosed youth. However, PTSD did *not* impact any of the other relations between maternal or paternal IPV and aggression toward mothers, friends, or romantic partners for the entire sample.

Similarly, when we examined the results separately for girls, we found evidence that the relation between witnessing mothers engage in aggression toward their partners and engaging in aggression toward fathers was stronger for youth diagnosed with PTSD. Specifically, a positive relation between maternal IPV and aggression toward fathers was found among girls diagnosed with PTSD ($\beta = .47, P = .04$); however, the relation between maternal IPV and violence toward fathers among non-PTSD diagnosed girls was not significant ($\beta = -.11, P = \text{NS}$). Again, there was a significant loss in fit ($\Delta\chi^2 = 4.0/\Delta df = 1$) when we constrained this relation to be equal across PTSD and non-PTSD groups.

Results also indicated that, for girls, the relation between witnessing fathers engage in violence toward his partner and aggression toward friends was stronger among youth diagnosed with PTSD. Specifically, paternal IPV was strongly related to aggression toward friends for girls who were diagnosed with PTSD ($\beta = .52, P < .01$) while there was no relation found between witnessing fathers engage in violence toward their partners and aggression toward friends in non-PTSD diagnosed girls ($\beta = -.08, P = \text{NS}$). Again, there was a significant loss in fit between a model that constrained the relation between paternal IPV and aggression toward friends to be equal and the unconstrained model ($\Delta\chi^2 = 4.5/\Delta df = 1$).

To summarize, the relation between IPV and aggression toward friends and fathers was stronger for youth diagnosed with PTSD: for adolescents diagnosed with PTSD, a significant percentage of the variance in aggression toward fathers could be explained by witnessing mothers engage in aggression toward her partner. Interestingly, for girls diagnosed with PTSD (vs. those who did not have

a PTSD diagnosis), there was also a significant relation between witnessing IPV perpetrated by their fathers and aggression toward friends. Analyses were not conducted by sex or for boys separately due to the relatively small number of boys in the sample who met PTSD criteria.

DISCUSSION

To our knowledge, this is the first study that attempts to assess the *unique* relations between exposure to mothers' vs. fathers' physical IPV and physical aggression by adolescent girls and boys within multiple relationship contexts. In contrast to previous studies, our findings estimate the relations of one parent's perpetration of physical IPV while controlling for the exposure to the other parent's involvement in IPV. Results provide some evidence of sex-specific modeling effects: for boys, there was a significant relation between witnessing father IPV and their physical aggression toward friends; however, girls' physical aggression toward friends was unrelated to father IPV. These findings confirm previous findings that boys who witness their fathers' violence toward their mothers suffer from a range of negative psychological consequences, including increased externalizing problems [Kitzmann et al., 2003]. We also found a relation between maternal IPV and physical aggression toward friends for girls, but mother IPV was unrelated to boys' aggression toward their friends. Together, these results suggest that sons may learn from their fathers to aggress toward their friends while girls may learn from their mothers to do so. However, in this study we did not examine family factors, such as warmth or reward power, which according to social learning theory affects parental modeling on children. Further research examining these factors will elucidate the processes that underlie modeling effects.

Results also showed that fathers' IPV was related to physical aggression toward fathers for girls but not for boys. Interestingly, there were no other relations found between IPV and aggression toward parents. These results differ from those of Ulman and Straus [2003] who concluded that mothers' IPV was most significant in determining child aggression toward their parents. Ulman and Straus [2003] also found that mothers were more likely than fathers to be victimized by their children while our findings show that mothers and fathers are equally likely to be the targets of aggression by their sons and daughters. The difference between our findings

and those reported by Ulman and Straus [2003] may be due to age differences between our samples. Their findings were based on a sample of children between 3 and 18 years of age while our study focuses exclusively on adolescents. Adolescents may be more likely than younger children to become physically aggressive toward fathers whom they witness victimize their mothers. Differences in findings may also be due to the fact that our sample was selected to tap those youth most at risk for exposure to IPV, PTSD, and aggressive behavior.

We also examined the relation between exposure to IPV and aggression toward romantic partners. Using SEM we found that mothers' IPV was significantly related to the use of aggression by both boys and girls toward their romantic partners, but father IPV was unrelated. Similar findings have been reported by Kinsfogel and Grych [2004] for boys: mothers' aggression (verbal and physical) toward fathers was related to increased dating aggression in boys. However, Kinsfogel and Grych [2004] also found that exposure to fathers' aggression increased boys' dating aggression while no significant relations emerged between maternal or paternal aggression and girls' aggression in romantic relationships. Kinsfogel and Grych [2004] suggest that girls who are exposed to parental conflict may be more sensitive to the interpersonal harm that aggression may cause in relationships whereas boys may focus on the instrumental value of aggression in achieving desired goals. While socialization of girls may indeed increase their awareness of others' emotional states [Cross and Madson, 1997], it is not clear that this necessarily results in lower levels of aggression toward partners. If this were the case, research should find that women generally engage in less aggression toward their partners than men. Yet findings show that women engage in similar if not more aggression, although they are less likely to inflict serious injuries [e.g., Archer, 2000; Ehrensaft et al., 2004; Migliaccio, 2002].

Why might mothers' IPV be uniquely linked to the use of aggression in adolescents' romantic relationships? One possibility is that mothers are often more central attachment figures for their sons and daughters than are fathers [Doherty and Feeney, 2004] and consequently play a critical role in shaping their children's understanding of and strategies for negotiating conflict in close interpersonal relationships. Further research is necessary to replicate these findings, particularly in normative populations, and to better understand the factors that underlie the influence of mothers' vs. fathers'

IPV on adolescents' use of aggression in romantic and other relationships.

An alternative explanation for our findings is that they reflect parental physical abuse of youth rather than exposure to parental IPV. Researchers [e.g., Crick and Dodge, 1996; Nagin and Tremblay, 1999] report that parents who are aggressive toward their children are likely to experience increased aggression in return. Not surprisingly, parental physical abuse is correlated with parental IPV and parents who engage in partner violence are at risk for perpetration of child physical abuse. Saunders [1994], for example, reports that about 50% of men who batter are also perpetrators of child abuse. Others [e.g., Straus and Gelles, 1990] have found that mothers, especially those who are battered, perpetrate child physical abuse more often than fathers do.

In our study, approximately 60% of youth who were exposed to parental IPV also reported exposure to physical abuse by their mother and/or father. Additional analyses were completed to account for the role of mother or father physical abuse toward youth on the relation between exposure to IPV and youths' aggressive behavior.³ Results confirmed that even when parental physical abuse was controlled, all findings reported in this study on the relation between exposure to maternal and paternal IPV and youth aggression remained significant with only one exception: the relation between exposure to fathers' IPV and daughters' aggression toward their father was no longer significant once exposure to paternal physical abuse was controlled. It is possible that physical abuse is a key risk factor primarily for aggression within families while witnessing parental IPV has more pervasive relations with aggression in multiple interpersonal relationships. Similar findings are presented by Maxwell and Maxwell (2003) who suggest that exposure to IPV is an equally, if not more, important factor in explaining antisocial behavior, including aggression. Further research is warranted to disentangle the distinctive effects of IPV vs. child physical abuse.

Our research also examined whether the relation between exposure to parental IPV and adolescents' use of aggression in relationships differed depending on whether youth met criteria for PTSD. We assessed PTSD using an empirically validated diagnostic interview (DICA-IV). Approximately one third of adolescents in our sample, representing a higher percentage of girls (46%) than boys (22%),

³The relationship between exposure to IPV, physical abuse and aggression across relationships was tested via hierarchical regression analyses.

reached full diagnostic criteria. These findings are comparable to other studies of similar populations [e.g., Abram et al., 2004; Stewart et al., 2004]. Traumatic experiences in our sample included serious physical assault, sexual assault, and witnessing someone die.

Previous research using self-report measures of PTSD symptoms has indicated that these symptoms play a central role in determining the impact of maltreatment on child psychopathology [Wekerle et al., 2001; Wolfe et al., 2004]. According to our findings, PTSD influenced the relation between exposure to parental IPV and aggression in two ways: first, a significant relation between maternal IPV and aggression toward fathers was observed only for adolescents diagnosed with PTSD; second, looking specifically at girls, we found that the relation between exposure to paternal IPV and aggression toward friends was significant only for girls diagnosed with PTSD.

Our findings provide additional support for developmental traumatology models that identify PTSD as the key factor in determining the impact of maltreatment on child psychopathology. However, the impact of PTSD we detected was more limited than those reported in previous research [Wekerle et al., 2001; Wolfe et al., 2004]. In fact, PTSD moderated only two of the eight potential relations between exposure to maternal and paternal IPV and aggression. Given the previous findings reported by Wekerle and colleagues [Wekerle et al., 2001; Wolfe et al., 2004], we conducted supplementary analyses to assess mediation; however, no significant evidence emerged. There are, however, important differences between past studies and our own. First, we assessed PTSD through a structured diagnostic interview rather than through a self-report measure. Many previous studies have relied on Briere's Trauma Symptom Checklist [1996] or similar measures that assess a wide range of symptoms including anxiety (e.g., "feeling tense all the time"), depression (e.g., "sadness"), and anger (e.g., "desire to physically hurt somebody"). Such measures pose a risk of redundancy between predictor variables (i.e., PTSD symptoms) and the outcomes. This seems most obvious in the case of anger symptoms. In addition, the broad array of symptoms tapped by self-report measures of PTSD leaves open the possibility that findings are due to general distress rather than PTSD per se. Research combining diagnostic and self-report measures would best disentangle these measurement issues from the effects of trauma on the relation between exposure to maltreatment and psychopathology.

Second, diagnostic measures such as the DICA-IV can be insensitive to sub-clinical symptoms of PTSD and dichotomous rather than continuous analysis of the relation of trauma symptoms to outcomes may underestimate relations. Finally, our sample was highly selective: the majority of youth reported experiencing one or more forms of serious child maltreatment. Findings from our study may not generalize to normative populations nor to understanding the role of sub-clinical PTSD symptoms. Continued research with normative and clinical samples is necessary to develop a comprehensive model of how sub-clinical symptoms of PTSD and the full syndrome influence the relation between maltreatment and aggression.

It is important to point out the limitations of our study which temper the conclusions we can draw from our findings. First, our data were limited to concurrent rather than longitudinal assessment of parental IPV, adolescent aggression, and adolescent PTSD. As a result, we are limited in drawing causal inferences from our analyses and cannot rule out alternative models that may explain our findings. For example, it is possible that our findings reflect a genetic predisposition for aggression which similarly affects parents and their offspring. Alternatively, aggressive behavior in children may trigger parental IPV which in turn escalates child aggression. Our findings related to the role of PTSD in the relation between exposure to IPV and adolescent aggression are also limited. There is good reason to believe that exposure to parental IPV contributes to the development of PTSD and without longitudinal data we cannot be certain of whether PTSD moderates or mediates the relation between exposure to IPV and child aggression. The relations between exposure to IPV, PTSD, and child aggression are most likely transactional and complex requiring careful longitudinal mapping of causal sequences. This type of research is not only time consuming, but it also presents significant ethical challenges.

In addition to these limitations, we wish to point out that although our sample size was sufficient to conduct SEM on our overall model according to Bentler's [1988] suggestion of a minimum 5:1 ratio of subjects to estimated parameters, we were constrained in the examination of sex-specific patterns in the results. Specifically, the low number of boys with PTSD diagnosis precluded examination of sex differences in the influence of PTSD on the relation between exposure to parental IPV and aggression. As well, our sample included only adolescents with moderate to severe behavioral difficulties. It is not clear that the pattern of

associations reported here will generalize to normative populations.

Despite the limitations, our findings contribute to the understanding of girls' and boys' aggression across relationship contexts. There is much to be gained by increasing the specificity in our measurement and modeling of the relations between exposures to maternal vs. paternal physical IPV and aggressive behavior in children and adolescents. By understanding which parent or parents serve as models for daughters and sons, and how they influence their children's use of aggression in different relationships, we are in a better position to develop interventions that reduce risk for intergenerational patterns of violence and aggression. At the same time, it is equally important to recognize that IPV does not typically occur in isolation from other forms of child maltreatment. In this case, advanced statistical modeling procedures help us to disentangle the specific relations between various forms of maltreatment and child adjustment. The use of these techniques in future research will significantly improve our understanding of the complex relations between exposure to risk contexts and child development.

REFERENCES

- Abram KM, Teplin LA, Charles DR, Longworth SL, McClelland GM, Dulcan MK. 2004. Posttraumatic stress disorder and trauma in youth in juvenile detention. *Arch Gen Psychiatry* 61: 403–410.
- American Psychiatric Association. 1994. "Diagnostic and Statistical Manual of Mental Disorders," 4th edition. Washington, DC: American Psychiatric Press.
- Arbuckle JL. 2003. "Amos 5.0 Update to the Amos User's Guide," Chicago, IL: Smallwaters Corporation.
- Archer J. 2000. Sex differences in aggression between heterosexual partners: A meta-analytic review. *Psychol Bull* 126:651–680.
- Archer J. 2004. Sex differences in aggression in real-world settings: A meta-analytic review. *Rev Gen Psychol* 8:291–322.
- Baldry AC. 2003. Bullying in schools and exposure to domestic violence. *Child Abuse Neglect* 27:713–732.
- Bandura A. 1973. "Aggression: A Social Learning Analysis," Englewood Cliffs, NJ: Prentice-Hall.
- Bentler PM. 1988. Comparative fit indexes in structural models. *Psychol Bull* 107:238–246.
- Briere J. 1996. Psychometric review of the Trauma Symptom Checklist-40. In: Stamm BH (ed): "Measurement of Stress, Trauma, and Adaptation," Lutherville, MD: Sidran Press.
- Chen PH, White HR. 2004. Interparental conflict and adolescent dating relationships: Integrating cognitive, emotional, and peer influences. *Violence Against Women* 10:1283–1301.
- Crick NR, Dodge KA. 1996. Social information-processing mechanisms on reactive and proactive aggression. *Child Dev* 67: 993–1002.
- Cross SE, Madson L. 1997. Models of the self: Self-construals and gender. *Psychol Bull* 122:5–37.
- Doherty NA, Feeney JA. 2004. The composition of attachment networks throughout the adult years. *Pers Relat* 11:469–488.
- Ehrensaft MK, Moffitt TE, Caspi A. 2004. Clinically abusive relationships in an unselected birth cohort: Men's and women's participation and developmental antecedents. *J Abnorm Psychol* 113:258–271.
- Fergusson DM, Horwood LJ. 1998. Exposure to interparental violence in childhood and psychosocial adjustment in young adulthood. *Child Abuse Neglect* 22:339–357.
- Jankowski MK, Leitenberg H, Henning K. 1999. Intergenerational transmission of dating aggression as a function of witnessing only same sex parents vs. opposite sex parents vs. both parents as perpetrators of domestic violence. *J Fam Violence* 14:267–279.
- Kilpatrick DG, Ruggiero KJ, Acierno R, Saunders BE, Resnick HS, Best CL. 2003. Violence and risk of PTSD, major depression, substance abuse/dependence, and comorbidity: Results from the National Survey of Adolescents. *J Consult Clin Psychol* 71: 692–700.
- Kinsfogel KM, Grych JH. 2004. Interparental conflict and adolescent dating relationships: Integrating cognitive, emotional, and peer influences. *J Fam Psychol* 18:505–515.
- Kitzmann KM, Gaylord NK, Holt AR, Kenny ED. 2003. Child witnesses to domestic violence: A meta-analytic review. *J Consult Clin Psychol* 71:339–352.
- Margolin G, Gordis EB. 2000. The effects of family and community violence on children. *Annu Rev Psychol* 51:445–479.
- Maxwell CD, Maxwell SR. 2003. Experiencing and witnessing familial aggression and their relationship to physically aggressive behaviors among Filipino Adolescents. *J Interpers Violence* 18: 1432–1451.
- McGee RA, Wolfe DA, Wilson SK. 1997. Multiple maltreatment experiences and adolescent behavior problems: Adolescents' perspectives. *Dev Psychopathol* 9:131–149.
- Meiser-Stedman R. 2002. Towards a cognitive-behavioral model of PTSD in children and adolescents. *Clin Child Fam Psychol* 5: 217–232.
- Melchert TP. 1998. Testing the validity of an instrument for assessing family of origin history. *J Clin Psychol* 54:863–875.
- Migliaccio TA. 2002. Abused husbands. A narrative analysis. *J Fam Issues* 23:26–52.
- Muthén M, Muthén LK. 2004. "Mplus Version 3.1," Los Angeles, CA: Muthén & Muthén.
- Nagin D, Tremblay RE. 1999. Trajectories of boys' physical aggression, opposition, and hyperactivity on the path to physically violent and nonviolent juvenile delinquency. *Child Dev* 70:1181–1196.
- Reich W, Welner Z, Herjanic B, MHS Staff. 1997. "User's Manual for the Child/Adolescent and Parent Version," Toronto, ON: Multi-Health Systems Inc.
- Saunders DG. 1994. Child custody decisions in families experiencing woman abuse. *Social Work* 39:51–59.
- Steiner H, Cauffman E. 1998. Juvenile justice, delinquency, and psychiatry. *Child Adol Psychol* 7:653–672.
- Stewart AJ, Steinman M, Cause AM. 2004. Victimization and posttraumatic stress disorder among homeless adolescents. *J Am Acad Child Psychol* 43:325–331.
- Straus MA. 1979. Measuring intrafamily conflict and violence: The Conflict Tactics (CT) Scales. *J Marriage Fam* 41:75–88.
- Straus MA. 1990. The Conflict Tactics Scales and its critics: An evaluation and new data on validity and reliability. In: Straus MA, Gelles RJ (eds): "Physical Violence in American Families: Risk Factors and Adaptations to

- Violence in 8, 145 Families," New Brunswick, NJ: Transaction, pp 49–73.
- Straus MA, Gelles RJ. 1990. "Physical Violence in American Families," Somerset, NJ: Transaction.
- Ulman A, Straus MA. 2003. Violence by children against mothers in relation to violence between parents and corporal punishment by parents. *J Comp Fam Stud, Spec Issue: Violence Women Fam* 34:41–60.
- Wechsler D. 1991. "Wechsler intelligence scale for children, 3rd edition," New York: Psychological Corporation.
- Wechsler D. 2003. "WISC-IV Technical and Interpretive Manual," San Antonio, TX: Psychological Corporation.
- Wekerle C, Wolfe DA, Hawkins DL, Pittman AL, Glickman A, Lovald BE. 2001. Childhood maltreatment, posttraumatic stress symptomatology, and adolescent dating violence: Considering the value of adolescent perceptions of abuse and a trauma mediational model. *Dev Psychopathol* 13:847–871.
- Wolfe DA, Crooks CV, Lee V, McIntyre-Smith A, Jaffe PG. 2003. The effects of children's exposure to domestic violence: A meta-analysis and critique. *Clin Child Fam Psychol Rev* 6:171–187.
- Wolfe DA, Wekerle C, Scott K. 2004. Predicting abuse in adolescent dating relationships over 1 year: The role of child maltreatment and trauma. *J Abnorm Psychol* 113:406–415.