

The Associations Between Community Violence, Television Violence, Intimate Partner Violence, Parent–Child Aggression, and Aggression in Sibling Relationships of a Sample of Preschoolers

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Objective: High levels of aggression between siblings have been associated with deleterious short- and long-term effects. The objective of the current study was to examine how different types of violence exposure may be related to this form of aggressive behavior in children. **Methods:** This study examined 213 mother–child dyads that were exposed to varying levels of community violence and disorder, intimate partner violence, father–child physical aggression, and television (TV) violence. Families were from several Head Start Programs in the Midwest. **Results:** Main effects of hierarchical linear regression analyses indicated that higher maternal depression and children’s greater exposure to violent TV were significantly associated with more aggressive behavior toward a sibling. Further, father–child physical aggression interacted with community violence or disorder exposure to predict to aggression between siblings; that is, community violence was associated with sibling aggression only for children experiencing high levels of aggression from their fathers. **Conclusions:** These findings illuminate the multiple contextual factors that may be related to aggression between preschool-age children and their siblings in the home. Notably, viewing violent TV programming was significantly associated with sibling aggression even after accounting for family and community violence. This suggests the importance of reducing children’s exposure to violence across all domains, rather than solely focusing on one particular mode of violence exposure.

Keywords: sibling aggression, violence exposure, maternal depression, child abuse

Although children’s aggressive behavior can occur in a number of contexts, relatively little research has examined aggressive behavior in the sibling relationship, which has been identified as one of the most violent dyadic relationships in the family (Finkelhor, Omrod, Turner, & Hamby, 2005; Straus & Gelles, 1990). The study of aggression in sibling relationships is especially important because siblings are young

children’s most frequent companions (McHale & Crouter, 1996), and therefore, may be the most convenient target when a child acts out aggressively. Childhood sibling aggression can take the form of physical, verbal, or psychological maltreatment and is at its highest level in early childhood (Finkelhor et al., 2005; Kiselica & Morrill-Richards, 2007). The purpose of the current study was to examine how various types of violence exposure may relate to aggression in sibling relationships.

A national survey of U.S. family violence indicated that sibling aggression is the most prevalent type of violence in the family, with 80% of children between the ages of 3 and 17 having physically assaulted a sibling at least once (Straus & Gelles, 1990). The daily frequency of sibling aggression has been found to be quite high, with an average of 7 to 12 mild and severe violent events occurring between siblings across just 3 hr of in-home observation (Martin & Ross, 2005). Psychological maltreat-

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ment by a sibling is also common, with reports indicating that 80% of siblings experience repeated belittling, provocation, and scorn, and 30% experience persistent bullying by a sibling (Duncan, 1999; Weihe, 1990). As many as 53% of children experience regular hitting or pushing by a sibling and 8% of college students reported ongoing physical abuse by a sibling during childhood (Duncan, 1999; Graham-Bermann & Cutler, 1994). Unfortunately, relatively few studies make a clear distinction between aggressive behavior toward a sibling and chronic abuse (Kiselica & Morrill-Richards, 2007). However, data from large national studies indicates that up to 14% of siblings between the ages of 3 to 17 report severe forms of violence, such a beating up or using a gun or knife during a sibling conflict (Eriksen & Jensen, 2009).

Studies of gender differences in sibling aggression report mixed results. One large-scale study found neither gender differences in maternal reports of sibling aggression nor differences in sibling aggression based on the gender composition of the sibling dyad (Natsuaki, Ge, Reiss, & Neiderhiser, 2009). However, studies of older children have shown that males report higher rates of perpetrating sibling violence and females report higher rates of victimization by a sibling (Button & Gealt, 2010; Graham-Bermann, Cutler, Litzenberger, & Schwartz, 1994; Noland, Liller, McDermott, Coulter, & Seraphine, 2004). Males also have reported higher levels of the perceived acceptability of sibling aggression than females (Hardy, Beers, Burgess, & Taylor, 2010).

Aggression between siblings may be discounted by some parents as a normative part of child development, but recent research indicates that the negative impacts of sibling aggression are equal to that of experiencing peer violence (Finkelhor, Turner, Ormrod, & Hamby, 2009). Sibling aggression predicts greater levels of emotional disturbances, behavior problems, delinquency, and future aggressive behavior in dating and intimate partner relationships (e.g., Bank, Burraston, & Snyder, 2004; Deater-Deckard, Dunn, & Lussier, 2002; Graham-Bermann et al., 1994; Noland et al., 2004). Button and Gealt (2010) found that both psychological and physical aggression between siblings increased the odds of children's future aggression (e.g., hitting with the intent to hurt)

and delinquent behavior. Thus, the sibling relationship may be a critical factor in children's developing attitudes and behaviors associated with interpersonal violence.

Identifying potential contributors to sibling aggression may provide important avenues for possible prevention. Previous research has shown that sibling aggression is related to the presence of a number of other kinds of violence, including child maltreatment, intimate partner violence (IPV), peer violence, and dating violence (Button & Gealt, 2010; Rothman, Johnson, Azrael, Hall, & Weinberg, 2010). However, many of these studies have focused on older children or only one form of violence. Given that rates of sibling aggression are highest when children are young (Finkelhor et al., 2005; Kiselica & Morrill-Richards, 2007), the current study attempts to enhance the understanding of sibling aggression by examining its association with multiple forms of violence exposure in a sample of preschool-aged children.

IPV and Sibling Aggression

More than 15 million children are exposed to IPV each year (McDonald, Jouriles, Ramisetty-Mikler, Caetano, & Green, 2006). Not all IPV occurs while children are present in the home, but when children are at home, national studies have found that 95% of children have some kind of sensory exposure to the violence, with at least 60% being direct eye-witnesses to the violence (Fusco & Fantuzzo, 2009). Similarly, in examinations of chronically violent families, mothers report that children are eye-witnesses to ~80–90% of the abuse (Kulkarni, Graham-Bermann, Rauch, & Seng, 2011). Witnessing this violence may place children at increased risk for a number of detrimental outcomes, including concurrent and future aggressive behavior (Salzinger, Rosario, Feldman, & Ng-Mak, 2008). In addition, studies have confirmed that IPV is associated with greater levels of aggression between siblings (Eriksen & Jensen, 2009; Graham-Bermann et al., 1994).

Parent–Child Aggression and Sibling Aggression

Physical aggression by parents is consistently linked to aggressive behavior in children (Ger-

shoff & Bitensky, 2007; Teicher, Gers Samson, Polcari, & McGreenery, 2006) via harsh and coercive parenting styles as well as through biological mechanisms such as neuroendocrine functioning (Cicchetti & Rogosch, 2001) and stress-related changes in structural brain development (Watts-English, Fortson, Gibler, Hooper, & De Bellis, 2006). Some researchers have found that an aggressive father-child relationship is especially predictive of later adjustment problems, more so than is mother-child aggression (Chang, Schwartz, Dodge, & McBride-Chang, 2003). Increased verbal aggression in parent-child dyads has also been positively related to the frequency of arguments between siblings (Hoffman, Kiecolt, & Edwards, 2005).

Community Violence and Sibling Aggression

Researchers have also linked exposure to community violence with aggressive behavior in children. National studies report that 19% of children have witnessed a community assault in the last year, with 29–38% as the childhood lifetime rate (Finkelhor et al., 2009; Zinzow et al., 2009). Exposure to community violence has been associated with externalizing problems, such as current attention deficit-hyperactivity disorder and future aggressive behavior (Malik, 2008; Margolin & Gordis, 2000; Salzinger et al., 2008). However, to the best of our knowledge, research has not addressed whether community violence also impacts the sibling relationship.

Exposure to Violence in the Media and Sibling Aggression

Recent national studies have found that the majority of preschool-aged children watch over 3 hr of television (TV) each day (Zimmerman & Christakis, 2005). While much of this programming is considered educational, preschool-aged children also watch, on average, one half hour of violent TV programming each day (Christakis & Zimmerman, 2007). In the Panel Study for Income Dynamics overseen by the National Science Foundation, children's TV viewing was reported by their parents in time diaries and later coded by researchers (Christa-

kis & Zimmerman, 2007). Criteria used to evaluate violent TV programming in this study were as follows:

if violence was a central and integral part of the plot or of the main characters' occupations, if the lead characters' main purpose was to fight or flee from violence, or if there was more violence in the program than would be expected in the everyday life of a child . . . it should be understood that the definition [of violence] includes hostile language, threatening behavior, and cartoon violence as well as realistic violence.

Aside from exposure to violent content, increased TV viewing is associated with a number of health risks for children, including obesity, social behavior problems, and unhealthy sleep behavior (Mendoza, Zimmerman, & Christakis, 2007; Sisson, Broyles, Newton, Baker, & Chernausek, 2011). Further, the link between children's viewing of violence in the media and aggression has been robust in the literature for decades, with researchers reporting both greater immediate and long-term aggression for those exposed to violent media content (Bushman & Anderson, 2001; Comstock, 2008; Huesmann, Moise-Titus, Podolski, & Eron, 2003). Studies have consistently found this link across age groups with effect sizes ranging from $r = .15$ – $.31$ (Bushman & Anderson, 2001; Bushman & Huesmann, 2001; Huesmann, 2007). This short-term increase in aggressive behavior may be especially relevant for the sibling relationship because of siblings' likely proximity after viewing aggressive TV together in the home.

Complex Violence Exposure

In a nationally representative sample of children, almost 40% of children reported experiencing direct victimizations in the past year (Finkelhor et al., 2009). Further, up to 60% of children in a smaller community sample reported exposure to multiple types of violence each year (e.g., parent-child maltreatment and community violence; Margolin et al., 2009). Researchers report that children and adolescents exposed to multiple forms of violence are significantly more negatively impacted than are children exposed to only one kind of violence (e.g., Pelcovitz, Kaplan, DeRosa, & Mandel, 2001; Sternberg, Baradan, Abbot, Lamb, & Guterman, 2006; Wolfe, Crooks, Lee, McIntyre-Smith, & Jaffe, 2003). For example, children exposed to both IPV and child maltreat-

ment had approximately twice the risk of having internalizing problems and 1.5 times the risk for aggression problems compared with children exposed to either form of violence alone (Sternberg et al., 2006). Retrospective studies have associated multiple adverse childhood experiences (ACEs) with poorer physical and mental health in adulthood (including substance abuse, obesity, suicide, and death), with greater risky-health behaviors, and less satisfactory relationships (Dube et al., 2005; Felitti et al., 1998). Others studies suggest that the aggregated effects are driven by the presence of physical abuse (Levendosky et al., 2002). An advantage of the current study is that it includes the assessment of both acute and broad risk factors for aggressive behavior, including parent-child physical aggression, allowing analyses that parse out individual and additive effects of a number of risk factors on sibling aggression.

Hypotheses

It was hypothesized that IPV, father-child physical aggression, community violence and disorder, and TV violence would be significantly associated with preschoolers' level of sibling aggression. It was also hypothesized that there would be a main effect of child sex, such that boys would show overall greater levels of aggression toward a sibling than would girls. The effects on sibling aggression of environmental violence (i.e., IPV, father-child physical aggression, TV, and community violence and disorder) were also tested by gender. It was hypothesized that boys with greater exposure to any form of violence, specifically TV violence, IPV, father-child physical aggression, and community violence and disorder, would exhibit higher levels of aggressive behavior toward a sibling than would girls exposed to these forms of violence. The model also controlled for children's total TV viewing per day, family income, and maternal depression.

Method

Procedure

Following institutional review board approval for meeting current standards for ethical research practice, participants were recruited using flyers with assistance from the Head Start

Community Action Agency offices in two Michigan counties; the current study was part of a Head-Start University Partnership Program aimed at better understanding the social and emotional development in 3- to 4-year-old children from low-income families (Graham-Bermann, Bermann, & Huesmann, 1999–2003). Responding mothers and their preschool-aged child were interviewed either in their homes or at a location based on the mother's preference by female research assistants trained in clinical research and ethics. Mothers were asked to give consent to have family case workers provide additional information about their family. All family case managers who were contacted completed the forms and were paid \$10. Mothers received \$30 for their participation.

Participants

Data were collected on 213 children enrolled in two Michigan Head Start programs, 150 of whom had at least one sibling. Children ranged in age from 3–5.5 years ($M = 3.64$, $SD = 0.36$). There were 105 boys and 108 girls. Child ethnicity was diverse, with 54% White, 23% Black, 21% Biracial, 2% Latino/a, and one Native American child. Mothers' age ranged from 18 to 43 years ($M = 27.73$, $SD = 5.40$ years). Mothers' self-reported ethnicity was White (67%), Black (24%), Latina (5%), and bi-racial (4%). Most (63%) of the mothers were working at least part time outside of the home, but the range was considerable, from 0 to 65 hr per week ($M = 22.12$, $SD = 19.10$). The majority of mothers completed high school (79%), while 38% had some additional training or college, and 2% obtained a college degree. More than one third of the mothers were currently married (35%), and 12% were separated or divorced, 27% were single, and 25% were living with a partner. Monthly income ranged from 0 to \$6,900 ($M = \$1,438$, $SD = \$876$).

Of the 150 children with a sibling, 28% ($n = 60$) had only one other sibling, 25% ($n = 53$) had two, 12% ($n = 26$) had three, 4% ($n = 8$) had four, 1% ($n = 2$) had five, and one child had six siblings ($M = 1.95$, $SD = 1.01$). Boys had more siblings than did girls, $t = 2.03$, $p < .04$. The number of siblings was not related to ethnicity, income, mother's education, or hours worked per week. Of the sibling who was clos-

est in age to the target child, 49% ($n = 73$) were boys and 51% ($n = 77$) were girls. There were 40 (27%) brother-brother sibling dyads, 39 (26%) sister-sister dyads, and 71 (47%) mixed gender dyads. The mean age of the sibling closest to the target child was 5.34 years ($SD = 3.51$) and the mean difference in age between the target child and closest age sibling was 1.67 years ($SD = 3.34$). Siblings ranged in age from 9 months to 17 years.

Measures

Demographics. Mothers completed a demographics questionnaire concerning monthly family income, relationship status, her age and race or ethnicity, the child's age and race or ethnicity, mother's highest level of education, and how many hours she worked per week.

Exposure to community violence and disorder. The Survey of Exposure to Community Violence, Parent Version (Richters & Martinez, 1993) was used to assess the child's exposure to incidents of violence in the community. Mothers reported whether their child had witnessed each of 13 types of violence outside the home. Items ranged from moderately severe violence (e.g., seeing someone beaten, in a serious accident) to severe violence events (e.g., seeing someone shot or stabbed). Items were scored 1 for *exposure* and 0 for *no exposure* and were summed for a total score, with a potential range from 0 to 13. For the present study reliability was .69 (α).

Intimate partner violence. The Conflict Tactics Scale (CTS; Straus, 1979) was designed to assess dyadic conflict between partners in a number of domains. Items assess the presence of both mild violence and severe violence tactics ranging from pushing and shoving, to beating up, threatening to use or using a gun or knife. The CTS has proven reliability in national surveys ($\alpha = .83$; Straus, 1987). To assess physical violence, only the mild and severe physical assault tactics scales are reported here. Present study reliability was .84 (α) for partner-to-mother domestic violence. Mothers reported on both the presence and the frequency of conflict tactics that occurred during the past year and whether the child witnessed these events. Thus, the potential frequency for each item ranged from 0 (*never*) to 365 (*every day*).

To provide a second measure of domestic

violence exposure, family case managers were asked to indicate whether they believed that the husband or partner had: (0) no conflict with the woman; (1) argued with, insulted, or yelled at the woman; (2) pushed, shoved, or slapped the woman; or (3) hit or abused the woman. Case managers are assigned to each Head Start family and make regular home visits to parents and children and provide information and resource referrals to the family. Similarly, family case managers were asked to indicate whether the woman had done these things to her partner. Reliability for partner-to-woman violence was ($\alpha = .77$) and woman-to-partner violence was ($\alpha = .71$).

Physical aggression toward the child. The CTS has been successfully used to assess violence to children by parents and siblings in other studies (Straus, Hamby, Finkelhor, Moore, & Runyan, 1998). Mothers were asked to indicate the frequency with which mild and severe physical violence tactics were used by the father or parent toward the child in the last year, again ranging from never to 365 (every day). Mild physical violence tactics included throwing something but not at the child, throwing something at the child, and pushing the child. A question specific to spanking was added. Severe physical violence tactics included hitting with a stick or object, kicking the child, threatening with a weapon, and sexual assault. Reliability was .63 (α) for physical aggression against the child. In agreement with the collaborating programs following their specific request to protect their clients' privacy, we did not ask mothers to self-report the aggression tactics they used with their child or their partner.

Aggression toward a sibling. The Sibling Social Behavior Scales (SSBS) (Graham-Bermann, 2000) measure was designed to assess interpersonal relationship qualities of a target preschool-aged child and his or her closest age sibling. Based on the Brother-Sister Questionnaire (Graham-Bermann, 2000) created for use with school-age children, the SSBS asks mothers to indicate the extent that each of 30 items describing the behavior of the child with the sibling took place. Directions are: "How much would you say that your child shows the following behaviors when at home with his or her sibling?" A 4-point Likert-type scale is used to indicate: 1, *not at all*; 2, *a little*; 3, *often*; and 4, *most of the time*. Principal components

analysis provided three reliable factors accounting for 52% of the cumulative variance. In the current study, mothers completed this measure as it applied to the target child, and did not provide additional information on the aggressive behavior of other children. The three factors examine Cooperative Sibling Behavior, Sibling Victimization, and Aggressive Sibling Behavior. Only the Aggressive Sibling Behavior was used in the current analysis. It consists of 19 items reflecting verbal fighting, mild and severe physical fighting, and injuring or harming the sibling. The reliability of the Aggressive Sibling Behavior Scale for the current study was ($\alpha = .90$).

TV viewing. Mothers were also asked to report how much TV they believed their child watched each day by selecting from 4 choices: 0 = 0–1 hour per day, 1 = 2–5 hours, 2 = 6–9 hours, or 3 = 10 or more hours per day. Next they were asked to indicate the number of hours the child viewed TV or movies with violent or aggressive content. To help mothers determine what qualified as violent or aggressive content, TV and movie aggression was defined as “any instance where kicking, punching, killing, or physical hurting happens on the screen.” Mothers were asked to indicate whether the child watched violent or aggressive TV with the same four choices as above. Because the mothers’ reports of TV viewing could be subject to social desirability bias, a small pilot study compared the responses to these questions for a subset of 10 father and mothers. Eighty percent of parent couples were in complete parent agreement regarding TV viewing time with the remaining 20% disagreeing by one point on the rating scale. Parents were in agreement 70% of the time when rating violent TV viewing; thus, lending support for the reliability of mothers’ reports.

Maternal depressed mood. Mothers’ depressed mood was measured with the Center for Epidemiologic Studies for Depression Scale (CES-D) (Radloff, 1977). This self-report measure asks respondents to report on 20 symptoms of depressed mood during the past week using a 4-point rating scale, which ranged from *none of the time* to *most of the time*. An additional item asked whether the last week was typical of how the reporter was feeling. A cutoff score of 16 and above has been used as an indicator of clinically significant symptoms. Researchers re-

port internal reliability of .85 (α) and test–retest reliability of .54 (Radloff, 1977; Roberts, Andrews, Lewinsohn, & Hops, 1990). Reliability for the present study was .70 (α).

Results

Exposure to Violence and Physical Aggression Toward the Child

On average, children’s hours of TV watched per day ($M = 1.12$) equates to the average child watching more than 2 to 5 hr of TV, with 84% watching 2 to 5 hr, 10% watching 6 to 9 hr, and 3% watching 10 or more hours per day. Mothers reported that their child watched an average of 1 or less hour of violent programming each day (59% watched an hour or less, 40% watched 2–5 hr, and very few watched 6 or more hours each day; see Table 1).

Mothers reported an average of two types of father–child physical aggression within a year of their interview ($SD = 1.64$). More specifically, in terms of mild violence, 46% reported their child was pushed, 45% child spanked, 15% had something thrown but not thrown at the child, and 4% had something thrown at the child by a father during conflict. There were fewer reports of severe violence tactics, including 5% beaten or hit with an object, 3% hit or kicked, and 1% threatened with a weapon. However, despite the low frequency of each type of violence, the overall prevalence was high, with 66% of mothers reporting at least one incident of father–child physical aggression in the past year. The frequencies of these events are shown in Table 1.

Reports of exposure to community violence or disorder indicated that, on average, children witnessed just over one type of violence outside their home ($M = 1.25$, $SD = 0.56$). Mothers reported that 28% saw someone punched or hit, 19% witnessed someone being arrested, 17% witnessed a fire, 14% witnessed a mugging, 11% heard gunfire in their neighborhood, and 10% saw a serious accident. Another 9% saw someone being threatened with harm, and 4% witnessed drug dealing, and 3% saw a dead body. Few children saw someone threatened with a gun or knife (1%), saw someone stabbed (1%) or witnessed a shooting (1%). Others (14%) reported that their child witnessed a dif-

Table 1

Means and SD of Sibling Aggression, Television Exposure and Television Violence, Father–Child Physical Aggression, Community Violence, and IPV Scores

	<i>Mean</i>	<i>SD</i>	<i>Range</i>
Sibling aggression	1.82	0.60	1–4
Father–child physical aggression			
Number of types of tactics	1.66	1.64	0–7
Number of mild physical violence events last year			
Pushed child	8.94	24.72	0–156
Threw something	1.71	16.07	0–208
Threw thing at child	0.04	1.93	0–1
Spanked child	34.39	92.73	0–365
Severe physical violence events last year			
Hit or kicked child	0.16	1.84	0–24
Threat/weapon	0.01	0.75	0–1
Hit child with Object	0.35	2.42	0–20
Community violence	1.25	0.56	0–9
IPV	15.67	45.46	0–365
Hours/day violent TV	.43	.54	Coded 0 to 3 ^a

Note. ^a 0 = 0–1 hr, 1 = 2–5 hr, 2 = 6–9 hr, 3 = 10 or more hours/day.
N = 150.

ferent scary event, such as a police car chase or gangs on the street.

Twenty-four percent of mothers reported having experienced IPV from their partner, with a mean of 16 IPV incidents in the past year ($SD = 45.46$). Family case managers reported that 37% of the mothers in their caseloads experienced conflict from a partner in the last year, with 17% experiencing verbal conflict, 11% mild physical violence, and 9.4% hit or abused by a partner. Additionally, 23% of the mothers engaged in conflict toward their partner in the last year, with 16% in verbal conflict, 3% in mild physical conflict, and 4% physically hitting or abusing their partner. There was a positive and significant association between mother and family case manager reports of IPV ($r = .244, p < .001$).

The level of depression for the mothers in this sample was high, with the mean report of depression symptoms above the clinical range of 16 or higher ($M = 23.22, SD = 7.38$). Only 8% of mothers in the sample reported levels of symptoms below the clinical range. Fifty-seven percent of mothers were in the mild depression range, and 35% were in the severe depression range.

Aggression Toward a Sibling

Scores on the Aggressive Sibling Social Behavior scale indicated that acts of physical vio-

lence among siblings were common. Only 28% of mothers reported that there was no mild physical aggression (pushing and shoving) between siblings. However, 35% reported that those behaviors happened a little, and 35% said they happened often. Another 15% said they took place most of the time the siblings were together. Severe violence, in the form of bites, scratches, kicking, or punching by their child, was reported by about half of the mothers (49%), with 22% reporting these behaviors took place a little, 11% often, and 3% most of the time. Twenty-one percent of mothers indicated that their child injured a sibling. Sibling aggression did not differ by dyad type (brother–brother, sister–sister, or mixed-gender dyads) or by sex of sibling, nor was it correlated with the age of closest sibling or number of children in the family.

A model was tested using hierarchical linear regression to ascertain whether exposure to violent or aggressive TV programming, father–child physical aggression, IPV, and community violence or disorder were significantly associated with preschoolers' level of aggression toward their siblings. Children who did not have a sibling were excluded from the analysis ($n = 63$). For the 150 children with a sibling, missing data on the measure of sibling aggression was 8%. Therefore, multiple imputation was performed in STATA before running regression

analyses (Royston, 2004). Five imputations were conducted, and all available study variables with complete data were used as predictors for imputed values. Total number of hours of TV watched per day, income, exposure to community violence or disorder, IPV, and father-child physical aggression, were abnormally positively skewed. Father-child physical aggression, and gender were centered to minimize multicollinearity in the interaction terms. Hours of total TV and hours of aggressive TV per day were moderately correlated ($r = .31$); thus, multicollinearity and singularity among the independent variables was not a concern. Correlations for variables entered into the regression model are shown in Table 2.

The first step of the hierarchical regression model included individual and family characteristics, that is, child sex, household income, and maternal depression. Father-child physical aggression was entered in the second step of the model, accounting for an additional 5% of variance in children's aggressive behavior toward a sibling. The inclusion of IPV in the next model only explained an additional 1% of the variance, but the inclusion of TV viewing and violent TV viewing explained an additional 10%. The final model of simple effects is presented in Table 3.

As a post hoc test, the multiplicative effects of violence were tested by entering violence-by-violence interaction terms into the final model (see Table 3). The interaction between parent child physical aggression and community violence or disorder was significant. To more closely examine this interaction, the interaction term was decomposed into high father-child physical aggression and low father-child physical aggression groups. These groups were then

graphed across varying levels of community violence with sibling aggression scores as the outcome variable (see Figure 1). Slopes for high and low father-child physical aggression groups were $\beta = .183$ and $\beta = -.083$, respectively. That is, sibling aggression was greater when there was a co-occurrence of high father-child aggression and high levels of community violence or disorder. Results for the model were essentially the same when the hierarchical regression was run with the sample stratified by gender (i.e., the same variables were significant for boys and for girls). In each case the total amount of variance accounted for was .23 (R^2) for boys and .32 (R^2) for girls.

Discussion

As many researchers have found, the mothers in this study reported that their child frequently exhibited aggressive behavior toward a sibling. Sibling physical assaults were reported for 72% of the children in this study, a figure that closely matches the 80% of children ages 3–17 with sibling assaults in national studies (Straus & Gelles, 1990). Approximately half participated in severe violence (49%), here kicking, biting, punching. Again, reflecting other studies that found 53% of children regularly hitting their sibling (Duncan, 1999).

Overall, the preschool-aged children in the current study experienced significant levels of violence in a variety of domains. Of the mothers reporting IPV, an average of 16 acts of IPV had occurred in the past year. On average, children in the current sample had experienced an average of two acts of father-child physical aggression in the past year. As such, many of children

Table 2
Matrix of Pearson Intercorrelation Values and Their Significance for Study Variables

	1	2	3	4	5	6	7	8
1. Sibling aggression	—							
2. Income	-.00	—						
3. Mom depression	.34***	-.03	—					
4. Father-child physical aggression	-.04	.12	-.06	—				
5. IPV	.19**	-.11	.14	-.03	—			
6. Hours TV	.14	-.16	-.00	-.03	-.09	—		
7. Hours violent TV	.30***	-.08	.20**	.13	.01	.31***	—	
8. Community violence	.16	-.05	.05	.01	.10	.09	.08	—

Note. $N = 150$.

** $p < .01$. *** $p < .001$.

Table 3

Hierarchical Linear Regression Analyses: Aggression Toward a Sibling and Associations With Demographics, Maternal Depression, TV Viewing, and Exposure to Violence on TV, at Home and in the Community

	β^a	VIF	R	R^2	$R^2\Delta$	F
Simple effects			.47	.22	.00	5.14**
Child sex	.06	1.12				
Income	.11	1.09				
Mom depression	.23**	1.17				
Father-child physical Aggression (FCPA)	-.16	1.38				
IPV	.13	1.12				
Hours TV	.11	1.19				
Hours violent TV	.30**	1.59				
Community violence (CV)	.03	1.06				
Interaction terms added to simple effects			.54	.29	.07	4.09***
FCPA*CV	.20*	1.21				
FCPA*IPV	.18	2.73				
FCPA*violent TV	.07	2.88				
Violent TV*CV	-.09	3.49				
Violent TV*IPV	.08	1.23				
CV*IPV	-.06	1.58				

Note. ^a Standardized Beta coefficient.
* $p < .05$. ** $p < .01$. *** $p < .001$.

in the current study were both directly victimized and likely exposed to their parents' violent conflicts as well. On average, children had witnessed one act of community violence. In an examination of exposure to community violence and disorder by the original developers of the Survey of Exposure to Community Violence, 84% of children in the first grade had

witnessed an act of community violence in their lifetime (Richters & Martinez, 1993). In contrast, 65% of preschoolers in the current study had exposure to community violence. This difference may possibly be explained by the young age of the sample in the current study, as large national studies on youth violence indicate that exposure to community violence increases as

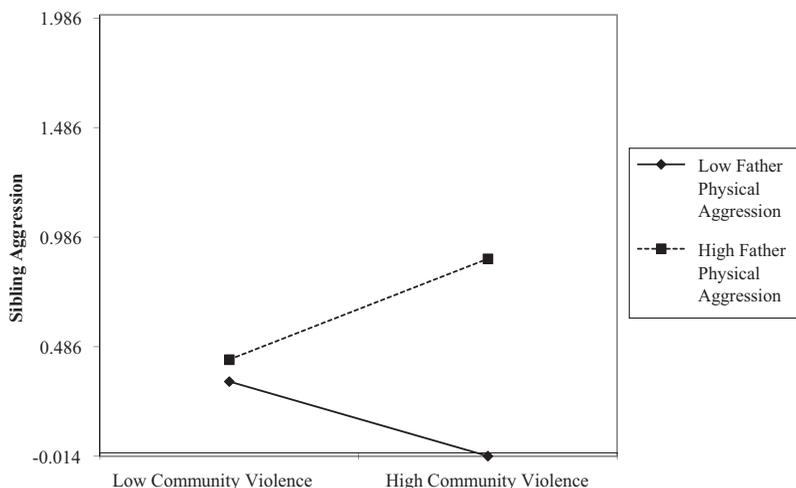


Figure 1. Interaction between father-child aggression and exposure to community violence.

children grow older (Finkelhor et al., 2009). Mothers also reported that their children viewed an average of 2 to 5 hr of TV each day, which is similar to rates found in national studies of children's TV viewing (e.g., Mendoza et al., 2007). These results support previous research findings that children are commonly exposed to and/or victimized by a number of different types of violence (Margolin et al., 2009).

Our results indicate that young children's exposure to multiple types of violence accounts for a significant portion of the variance in aggressive behavior toward their siblings. This result is commensurate with other studies that indicate that complex violence exposure (i.e., more than one type of violence) is associated with poorer adjustment outcomes for children (e.g., Finkelhor et al., 2005; Margolin et al., 2010). The hierarchical linear regression analysis findings also show that after controlling for relevant demographic factors, viewing violent TV programming was significantly associated with children's aggressive behavior toward their siblings. For this sample, when entered separately, neither IPV nor community violence or disorder were significantly related to children's aggressive behavior toward a sibling. However, the interaction between father-child physical aggression and community violence that was significantly related to sibling aggression (see Table 3). Studies that have examined these types of violence exposure separately report a link between specific types of violence exposure and aggressive behavior (e.g., Howell, Graham-Bermann, Czyn, & Lilly, 2010; Salzinger et al., 2008), leading researchers to hypothesize that exposure to several different forms of violence may have multiplicative effects. Some studies of complex violence exposure in adolescents have supported this hypothesis, for example, finding that exposure to IPV, parent-child aggression and community violence are related to greater rates of academic failure and delinquency than any form of violence alone (Margolin et al., 2010). The results of the current research support this perspective, with father-child physical aggression having a stronger relationship with children's aggressive behavior toward a sibling when in the presence of high community violence exposure, than did exposure to either type of violence alone.

Interestingly, children's violent TV program viewing was significantly related to sibling ag-

gression even after controlling for other kinds of violence. This finding is in keeping with the strong relationship found between violent media viewing and aggressive behavior (Bushman & Huesmann, 2001; Huesmann, 2007). It has not, however, been examined in light of aggression between siblings. Thus, the present study makes a unique contribution to the literature by highlighting that for young children violent TV programming may be related to aggressive behavior above and beyond the effects of direct victimization or exposure (as in the case of parent-child aggression or IPV).

While the overall model for the direct effects of violence exposure was significant and explained a significant portion of the variance in child aggression toward a sibling, the lack of significance of the main effects of IPV father-child physical aggression, and community violence is surprising. As these types of violence are frequently comorbid (Margolin et al., 2009), it is possible that the inclusion of all three types of violence exposure controlled for each other rather than any producing a significant effect. This is supported by the significant relationship of IPV and sibling aggression (see Table 2), which disappeared once IPV was entered into the full model. Previous research suggests a strong link between community violence and aggressive behavior (e.g., Malik, 2008; Margolin & Gordis, 2000). Further, the lack of a main effect for community violence or disorder may be because of the fact that these young children experienced very low levels of community violence. It is important, therefore, to note that the findings of the current study may not generalize to children experiencing higher levels of community violence and disorder, which has been shown to contribute directly to aggressive behavior in other studies (e.g., Salzinger et al., 2008).

Limitations

Although this study provides a more comprehensive picture of children's environments, the results also must be considered in light of the sample limitations. Participants consisted of mothers and their preschool-age children in Head Start programs in the Midwest, indicating a low-income and high-risk sample of families. Ethnic distribution is also not representative of families in Michigan, as the present study in-

cluded a greater number of minority families. Mothers in the current study also reported higher levels of depression than would be expected in a nonclinical population. While maternal depression was controlled for in the regression analyses, past studies have indicated that children exposed to concurrent maternal depression and violence are at even greater risk than children exposed to either risk factor alone (Silverstein, Augustyn, Cabral, & Zuckerman, 2006). Therefore, the results of the current study should be carefully considered in light of the fact that most children in the sample had this compound risk.

The lack of a main effect relationship between community violence and sibling aggression may have been impacted by the measurement of community violence events. Mothers were not asked to provide the frequency with which the child witnessed community violence events, but whether their child had witnessed any particular events over a 1-year period. This dichotomous response option likely decreased the variability in this variable, and might not have fully captured the extent of community violence exposure.

The current study only assessed father-child (and not mother-child) physical aggression. Although this was a necessary condition of collaborating programs, it may have caused total parent-child physical aggression to be underestimated. Therefore, it is unknown how the addition of mother-child physical aggression may have impacted the results of the study. Similar problems accrue when the mother is the reporter of IPV in the home. While an attempt was made to include a second source, the family case manager, it is not clear how much her reports were independent from the mother's version of events. A further limitation is the use of a single question concerning spanking.

While mothers in the study were given a definition of what constituted violent TV programming, the results of the current study are limited in that mothers may not have had an accurate understanding of how much violent programming their children truly watched. In addition, personal opinion may influence mothers' interpretations. For example, if a child is watching a show where a cartoon character is shot, one mother may believe that this is violent while another may recognize the violence, but believe that it is innocuous and therefore not

report it. More instruction as to how to classify the violence in ambiguous situations, such as TV cartoons, news reports, or music videos, would have improved this measure. While an attempt was made to address social desirability bias, future studies would be significantly strengthened if children's exposure to violent TV programming was verified by a trained coder or even controlled exposure.

It should also be noted that the measure of sibling aggression in the current study was reported by the mothers. Further, data were not collected on aggression exacted on the target child by their sibling, or on the age-related direction of aggression when considering the birth order of the target child and the sibling. The lack of complete information on aggression in the sibling dyad is a potential confound as sibling aggression is unlikely to be one-sided. While prevalence rates in the current study are commensurate to that of other studies, it is important to consider that mothers may not be accurate reporters of sibling aggression. Other methods, such as in-home observation or child reports, could provide validation. Future studies might consider using multiple measures of sibling aggression to determine which reporters give the most representative information on sibling aggression.

Future Directions

Future research could examine sibling aggression in light of other sibling relationship qualities to gain a better perspective on how to best evaluate the sibling relationship. Additional research on the role of psychiatric disorders, biological causes and exposure to other kinds of injury might further explain variation in sibling aggression. A future study might use a longitudinal design to address more complex transactional hypotheses; that is, how violence exposure and aggression may interact over time. Another important avenue for study would be evaluating the aggression of multiple siblings within the same family

Clinical Implications

The results of this study indicate that some preschool-age children are exposed to violence in many parts of their lives. While a main effect was found for TV violence within the home,

father-child physical aggression combined with exposure to community violence heightened risk for aggression with a sibling. Thus, those who seek to provide assistance to at-risk young children and their families would do well to consider and to evaluate more than one kind of violence in the child's life. Given the deleterious outcomes, and to protect children, particular attention should be paid to identifying maternal depression, parent-child physical aggression and what children are allowed to watch on TV. Interventions for parents related to aggression and violence between siblings might focus on the role of media violence in the family and their child discipline practices. Still, this study's findings would suggest the importance of reducing children's exposure to violence across all domains, rather than solely focusing on one particular mode of violence exposure.

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