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Understanding How Intimate Partner Violence Impacts School Age Children's Internalizing and Externalizing Problem Behaviors: A Secondary Analysis of Hawaii Healthy Start Program Evaluation Data

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Abstract

We examined the role of maternal depression and parenting stress in the relationship between intimate partner violence (IPV) and child internalizing and externalizing problems, and explored whether child gender modified these pathways. This secondary analysis used data from the Hawaii Healthy Start Program. Logistic regression models examined the associations between IPV in 1st grade and child internalizing and externalizing behaviors in 1st, 2nd, and 3rd grades. Mediation models used bootstrapping methodology and stratified models examined effect modification. Adjusted models with 214 mothers demonstrated associations between IPV and internalizing (adjusted odds ratios (aOR)=2.62; 95% CI 1.11, 6.21) and externalizing (aOR=4.16; 95% CI 1.55, 11.19) behaviors. The association with externalizing behaviors was mediated by maternal depression and parenting stress, while internalizing behaviors was mediated by depression only. Stratified models found the association between IPV and externalizing behaviors was significant for girls only. Our results support the importance of multicomponent maternal IPV interventions.

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Keywords

intimate partner violence; child behavior; mediation; depression; parenting stress

Childhood exposure to intimate partner violence (IPV) is pervasive, with as many as 275 million children exposed worldwide (UNICEF, 2006). A well-established body of research documents that IPV-exposed children are at risk for a host of poor social-emotional health outcomes (Baldry, 2003; Kernic et al., 2003; Margolin, 2005; McFarlane, Groff, O'Brien, & Watson, 2003). For example, in a cross-sectional study, Kernic found that the IPV-exposed children were significantly more likely than a normative sample to have borderline to clinical scores for externalizing and total behavior problems on the Child Behavior Checklist (CBCL) (Kernic et al., 2003). Similarly, McFarlane documented that internalizing, externalizing and total problem behaviors were significantly elevated in a community-based sample of children exposed to IPV as compared to a non-exposed sample (McFarlane et al., 2003).

To protect the health of IPV-exposed children, we must shape IPV interventions to reduce risks and to increase protective factors; this requires an empirically-based understanding of the mechanisms by which IPV adversely influences child health, with a focus on mediating and moderating influences. Such an understanding is concordant with priorities to enhance knowledge about how to best individualize mental health-related interventions. For example, within its strategic aims, the National Institute of Mental Health states that it seeks to "further develop innovative interventions and designs for intervention studies [by] promoting new psychosocial….trials that focus on the moderators and predictors of intervention response" (NIMH, 2008).

Empirical research has begun to consider causal mechanisms that might explain the link between IPV and poor child health. Supported by Conger's Family Stress model, maternal depression and parenting stress have been proposed as potentially important modifiable mediators (Conger, Rueter, & Conger, 2000). In other words, IPV threatens children's health through its effect on the caregiver (which has been described as the "spill over hypothesis") (Renner, 2009). Prior research shows that IPV is associated with maternal depression, elevated parenting stress, and disturbances in the parent-child relationship (Cascardi & O'Leary, 1992; Levendosky & Graham-Bermann, 1998; Owen, Thompson, & Kaslow, 2006; Postmus, Huang, & Mathisen-Stylianou, 2012). Moreover, early exposure to depression and compromised parenting adversely affect children's development (Cascardi & O'Leary, 1992; Levendosky & Graham-Bermann, 1998; Owen et al., 2006).

The next generation of research must delve deeper, disentangling not only the underlying mediating pathways, but also examining the degree to which the IPV exposure-child behavior association may operate differently for different children (Ermentrout, Rizo, & Macy, 2014). In particular, the impact of child gender remains both controversial and understudied (Holt, Buckley & Whelan, 2006). Researchers Davies and Lindsay proposed that gender differences in child reactions to high levels of inter-parental conflict, including IPV, can be conceptualized using two models: the male vulnerability model and the differential reactivity model (Davies & Lindsay, 2001). The male vulnerability model posits

that boys are more vulnerable to the adverse impact of inter-parental conflict, while the differential reactivity model states that inter-parental conflict tends to increase boys' externalizing symptoms and girls' internalizing symptoms. Within the IPV literature, some studies support these two models, while other studies find minimal differences by gender (Evans, Davies, & DiLillo, 2008; Holmes, 2013; Iverson, McLaughlin, Adair, & Monson, 2014; Miller, Howell, & Graham-Bermann, 2014).

To date, understanding of the IPV-child behavior pathway has been limited because many studies have focused solely on preschool age children, assessed families at only one point in time, and not examined whether mechanisms differ for boys versus girls (Hungerford, Wait, Fritz, & Clements, 2012). In addition, studies tend to examine only male-perpetrated IPV (Hungerford et al., 2012). Prospective, longitudinal data are needed to clarify the role of maternal depression and parenting stress in the IPV-child behavior relationship, and to discern whether these pathways vary by child sex. If either maternal depression or parenting stress mediates the IPV-child behavior relationship, then interventions for abused mothers would need to directly address these issues.

Therefore, we sought to examine the role of maternal depression and parenting stress as mediators in the relationship between IPV (perpetrated by both women and their partners) and maternal report of child internalizing and externalizing problems. In addition, we explored the degree to which child gender modified these pathways. All analyses were conducted using a sample of control group mothers enrolled in a study evaluating an early childhood home visitation program in Hawaii. Consistent with overall US statistics, approximately 20% of Hawaiian women have experienced IPV (Shoultz et al., 2015).

Methods

Study Design

The current longitudinal cohort study is a secondary data analysis, using data initially collected to evaluate the Hawaii Healthy Start Program (HSP), which is an early childhood home visitation program. Details about HSP and its evaluation have been published elsewhere (Duggan et al., 2007; Duggan et al., 2004; Duggan et al., 2004; Duggan et al., 1999). Briefly, the HSP study used a randomized controlled trial design to determine the effectiveness of early childhood home visitation in preventing child maltreatment and promoting healthy child development. Intervention families received home visitation by paraprofessionals. The content of these home visits included teaching families about child development, providing support, and demonstrating positive parenting and problem-solving strategies; home visitors also connected families to appropriate community-based resources, as needed. Previous findings suggest that HSP reduced IPV victimization and perpetration among intervention mothers (Bair-Merritt et al., 2010). Therefore, in the current analyses, only information collected from families randomized to the control group is used.

Study Sample

For the Hawaii HSP, staff identified at risk post-partum women who were eligible for home visitation between November 1994 and December 1995. Study eligibility requirements

included that families were: English speaking; not previously enrolled in a home visitation program; willing to enroll if assigned to the intervention; and not previously involved with Child Protective Services.

Data Collection and Measurement

Two hundred and seventy consenting families were randomly allocated to the main control group. Trained research staff interviewed mothers at seven time points, with the current analyses focusing on maternal interviews when children were in 1st, 2nd and 3rd grade. Sensitive measures, including questions about IPV, were self-administered. The current analyses, and the parent study, were approved by the authors' institutional review boards. In addition, the original HSP study was approved by the Hawaii Department of Health and the six recruitment hospitals. Participating families provided written informed consent.

Independent Variable—IPV was measured using the Revised Conflict Tactics Scale (CTS2). The 78-item CTS2 asks about behaviors used by partners in response to conflict, containing the following scales: verbal reasoning, verbal abuse, physical assault, sexual abuse and abuse leading to injury; each question asks about tactics used by the mother and then by her partner (Straus, Hamby, Boney-McCoy, & Sugarman, 1996). Based on coding recommendations by the creators of the CTS2, categorical responses options were converted to counts: never was coded as 0; once as 1; twice as 2; 3–5 as 4; 6–10 as 8; 11–20 as 15; and more than 20 coded as 25. Using these values, we created a count variable for the total number of past-year IPV acts by summing reported maternal and partner perpetrated verbal abuse, physical assault, sexual abuse and abuse leading to injury (Straus et al., 1996). Variance of the total count variable tends to be high, and thus, a categorical total score variable with three levels (based on the variable distribution) was used for final analyses. Alpha reliability coefficients range from 0.79–0.91, and adequate discriminant and predictive validity have been documented (Straus et al., 1996).

Dependent Variable—Child internalizing and externalizing behaviors were measured using Achenbach's Child Behavior Checklist (CBCL). The CBCL, asks caregivers to report the presence of child behaviors over the past 2 months on a 3-point Likert scale (0=not true, 1=somewhat or sometimes true, 2=very true or often true) (Achenbach & Edelbrock, 1981). The internalizing subscale contains questions about anxiety/depression, withdrawal and somatic complaints, while the externalizing subscale contains questions about aggressive and delinquent behaviors. Using commonly accepted, gender-adjusted score ranges for normal, borderline, and clinical problem behaviors, a binary variable was generated such that children were coded as 0 (no problem behaviors) if their scores fell in the normal range when they were in the 1st, 2nd and 3rd grade; and, 1 (problem behaviors) if their scores fell into the borderline and/or clinical range at any time point (1st, 2nd or 3rd grade). Alpha coefficients ranging from 0.89–0.92 have been documented (Gross et al., 2006).

Mediating Variables—The 20-item Center for Epidemiological Studies Depression Scale (CES-D) measured maternal depressive symptoms over the past week. It has been widely used in both urban and rural populations, with Cronbach's alpha ranging between 0.85–0.9 (Husaini, Neef, Harrington, Hughes, & Stone, 1980). Parenting stress was assessed using

Abidin's Parenting Stress Index- Short Form (PSI). The PSI Short Form, a 36-item measure with responses provided on a 5-point Likert scale, assesses parenting stress (Abidin, 1995). Cronbach's alpha ranges from 0.80–0.87 for the subscales and 0.91 for the total scale; six month test-retest coefficients range between 0.68–0.85 (Abidin, 1995). Both the CES-D and PSI measures were included in analyses as continuous variables.

Covariates & Modifying Variable—Data on the mother's age, race, employment status, and education as well as child sex (modifying variable) were collected at the baseline interview. Maternal substance use included reports of any illicit drug use and/or problem alcohol use at the 1st grade interview. Problem alcohol use was defined as self-report of alcohol use along with ≥ 2 positive responses on the 4-item CAGE questionnaire, a validated screen for problem alcohol use (Mayfield, McLeod, & Hall, 1974). Using this cutoff, sensitivity of the CAGE ranges from 61 and 100% and specificity ranges from 77 and 96% (Mayfield et al., 1974). Maternal responses to the CTS2 when their child was three years of age (the interview that immediately preceded the 1st grade interview) were used to account for previous IPV. Models also controlled for reports to Child Protective Services as count variables over two periods of life, including the number of reports during the first two years of life and the number of reports during 1st through 3rd grades.

Data Analyses—For all analyses, families were excluded if the mother was not the child's primary caregiver at two or more interviews. Preliminary analyses examined frequencies and distributions for all study variables to ensure that assumptions of normality were met. T-tests and chi-square analyses were carried out to ascertain whether the current sample was biased compared to the women who were excluded from the current analyses. Chi-square analyses tested for differences in proportions of sample characteristics across IPV tertiles. Logistic regression models examined the associations between IPV in 1st grade and child internalizing and externalizing behaviors in 1st, 2nd, and 3rd grades. The main predictor was a categorical indicator with three levels (zero, 1–10, ≥ 11) of total IPV counts in 1st grade. Unadjusted (univariate) models were examined first, followed by adjusted models.

Mediation models examined the extent to which associations between IPV and child problem behaviors were explained by maternal depression or parenting stress, in separate models. Mediation was tested using bootstrapping methodology with 95% confidence intervals, a robust contemporary method for testing mediation that does not rely on attenuated direct effects between the main predictor and outcome of interest (Hayes, 2013). This bootstrap methodology focuses on significant associations between IPV and the mediators, as well as associations between mediators and child problem behaviors. The bias-corrected bootstrap confidence interval for each indirect effect was based on 10,000 bootstrap samples (Hayes, 2013). Significant mediation is present when the 95% confidence interval for the proposed intervening effect does not cross zero with the point estimate indicated with a *z* statistic. Finally, differences by child sex in the association between IPV and child problem behaviors, including mediation models, were examined using stratified models. All analyses were conducted in SPSS Version 20 with the significance level set at $p<.05$.

Results

The final sample consisted of 214 mothers; 56 mothers (20%) were excluded because they did not have custody of their children at two or more of the interview points. Socio-demographic characteristics of mothers not included in the final sample significantly differed only by racial background.

Descriptive statistics (Table 1) demonstrate that at the time of their child's birth (baseline), mothers were primarily between the ages of 21 and 23 years and the majority had at least a high school education but were unemployed. A few sample characteristics differed based on IPV (when children were in 1st grade) including age, substance abuse and maternal education. For each sub-type of IPV (verbal abuse, physical assault, sexual abuse and abuse leading to injury), mothers generally reported equal rates of perpetration and victimization (data available upon request).

Unadjusted logistic regression models (Table 2) demonstrated that children were significantly more likely to exhibit internalizing problem behaviors during the early grade school years when their mothers reported up to 10 acts of IPV during 1st grade (odds ratio (OR) 2.32; 95% Confidence Interval (CI) 1.06,5.10), compared to mothers who reported no IPV during the same time period. Children were more likely to exhibit externalizing behaviors during the early grade school years when their mothers reported 11 or more acts of IPV during 1st grade compared to mothers who reported no IPV during the same time period (OR 3.13, 95% CI 1.52, 6.42).

Adjusted regression models (Table 2) demonstrated significant associations between reports of IPV in 1st grade and child internalizing behaviors during 1st, 2nd or 3rd grades (adjusted odds ratios (aOR)=2.62; 95% CI 1.11, 6.21), with children significantly at risk for internalizing problem behaviors when mothers reported up to 10 acts of IPV during 1st grade. Adjusted regression models also demonstrated significant associations between reports of IPV during 1st grade and child externalizing behaviors (aOR=4.16; 95% CI 1.55, 11.19) behaviors, with children significantly at risk for externalizing behaviors when mothers reported 11 or more acts of IPV during 1st grade.

Bootstrapping mediation models demonstrated that the association with externalizing behaviors was mediated by both maternal depression and parenting stress, while the association with internalizing behaviors was mediated by maternal depression only (Hayes, 2013). The 95% confidence intervals did not cross zero for the intervening effects of maternal depression (z = 3.19; 95% CI .30 to 1.27) or parenting stress (z = 2.70; 95% CI .19 to 1.20) in the association of IPV and externalizing behaviors. Confidence intervals suggested significance for the intervening effect of maternal depression in the association between IPV and internalizing child behaviors (z = 2.23; 95% CI .06 to .99).

Stratified models demonstrated no difference for internalizing child behaviors based on sex. In contrast, in stratified models, the direct association between IPV and child externalizing behaviors was significant for girls (aOR=4.81; 95% CI 1.19, 19.44) but not boys. Indirect effects through maternal depression (z = 2.52; 95% CI .19 to 1.54) and stress (z = 2.39; 95% CI .15 to 1.54) were also significant for girls only.

Discussion

This study, using a sample of at-risk mothers, suggests that maternal depression and parenting stress play a central role in the pathway linking childhood IPV exposure with child internalizing and externalizing behavior problems, and that this pathway may differ subtly by child sex. Specifically, our results support that maternal depression is partially responsible for the adverse impact of IPV on both girls' and boys' internalizing symptoms. In addition, in stratified models, IPV increased externalizing symptoms for girls only, and this pathway was mediated both by maternal depression and parenting stress.

Our finding that only girls were at significantly higher risk for developing externalizing symptoms differs from prior studies, which conclude that boys are generally more susceptible to problematic behavior from IPV exposure (Evans et al., 2008; Holt et al., 2006; Kerig, 1998). Supporting prior findings are theories that suggest that girls are socialized to prioritize interpersonal connectedness, while boys prioritize independence and self-sufficiency (Davies & Lindsay, 2001). Thus, girls may seek to maintain harmony by withdrawing whereas boys may be more likely to assert themselves (Davies & Lindsay, 2001). We posit that our results may differ because our sample included IPV in which mothers reported perpetrating violence. Children commonly self-identify with their same sex parent; in this sample, girls may have been modeling their mother’s actions. In addition, we found that parenting stress acted as a mediator only in the association between IPV and girls’ externalizing behaviors. While this warrants further investigation, it is possible that mothering a daughter amidst IPV leads to parenting stress because women also self-identify with their same sex children and do not want their daughters to perpetuate the cycle of violence in their future relationships; this parenting stress then may translate into aggressive acts among girls.

Consistent with other studies, maternal depression was a mediator for child internalizing and externalizing behaviors. While the majority of literature has focused on pre-school age children, some parallel work with school age children finds that maternal psychological functioning plays an important role in predicting outcomes for IPV exposed children (Graham-Bermann, Howell, Lilly, & Devoe, 2011). In a sample of IPV-exposed 6 to 12-year-old children, Graham-Bermann reported that children found to be “resilient” had mothers with fewer depressive symptoms (Graham-Bermann et al., 2011). Children depend on a nurturing caregiving relationship for healthy growth and development, and strong caregiver-child relationships can help buffer the adverse impact of environmental stressors like IPV. However, depression can make it more difficult for mothers to form these relationships with their children (Maddoux et al., 2014). Although leaving a violent relationship would likely significantly reduce children’s IPV exposure, decisions to end relationships are complex and involve constant weighing of safety, financial and other considerations. Thus, interventions to mitigate the impact of IPV also should consider including actively addressing maternal depression.

Early childhood home visitation represents a promising strategy within which to embed a multifaceted IPV and depression intervention. In 2010, the United States created the Maternal, Infant, and Early Childhood Home Visiting (MIECHV) Program, which

substantially increases the federal investment in evidence-based home visiting (Avellar et al., 2014). States and territories accepting MIECHV Program funding are expected to show quantifiable improvements in six benchmark areas, one of which directly relates to IPV. States are expected to report on IPV screening, referrals and safety plan development (Avellar et al., 2014). Also funded through the MIECHV Program is the Home Visiting Research Network (HVRN), designed to advance the home visiting field through research. In 2013, HVRN identified ten research priorities for home visiting, including strengthening home visiting effectiveness (HVRN, 2014). However, according to the Home Visiting Evidence of Effectiveness (HomVEE) review of the available evidence-based models, only two have shown favorable impacts on IPV (Avellar et al., 2014; Bair-Merritt et al., 2010; Olds et al., 2004). Furthermore, the evidence for these two models is limited to one study per model, each with different definitions of IPV and study follow-up time frames (HVRN, 2014); therefore, testing a comprehensive IPV intervention program fits well within early childhood home visitation expectations and priorities.

While using the Hawaii HSP evaluation data has many advantages, several limitations must be considered. Both IPV and child behavior data were collected by maternal report; while consistent with most similar studies, maternal report is subject to recall and social desirability biases. Abused mothers may have more negative perceptions of child behavior than mothers who have not experienced abuse. Hence, we cannot decipher whether children are 1) actually demonstrating problem behaviors or 2) their mothers are perceiving normal behaviors as problematic. However, both of these possibilities have important implications -- if children truly have problematic behaviors, these must be addressed and, if mothers have a biased perception of their child's behavior, interventions must examine the root of these perceptions, and teach abused mothers about normal child development. In addition, the parent study recruited families living in Hawaii who were at high-risk of child maltreatment, which limits generalizability. However, this is an under-studied, at risk population.

The urgent need for evidence-based programs that meet the needs of IPV-exposed children has been described repeatedly (Ermentrout et al., 2014). Our results suggest that pathways linking IPV exposure to child outcomes may differ by gender. They further support that multicomponent interventions that address underlying mediating factors, like maternal mental health and parenting stress, may have more success than those that focus solely on IPV.

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Table 1

Sample Characteristics

		IPV Counts During First Grade		
	Overall (N=214)	**Zero (N=112)**	**1–10 (N=43)**	**≥11 (N=59)**
Variable[a]	**N (%)**	**N (%)**	**N (%)**	**N (%)**
Maternal Age**				
14–20	81 (37.9)	34 (30.4)	16 (37.2)	31 (52.5)
21–23	104 (48.6)	57 (50.9)	24 (55.8)	23 (39.0)
26–42	29 (13.6)	21 (18.8)	3 (7.0)	5 (8.5)
Maternal Race				
Native Hawaiian or Pacific Islander	68 (31.8)	29 (25.9)	20 (46.5)	19 (32.2)
Asian or Filipino	52 (24.3)	30 (26.8)	10 (23.3)	12 (20.3)
White	32 (15.0)	21 (18.8)	3 (7.0)	8 (13.6)
All Others	62 (29.0)	32 (28.6)	10 (23.3)	20 (33.9)
Maternal Employment				
Did not work last year	117 (54.7)	57 (50.9)	21 (48.8)	39 (66.1)
Maternal Education**				
High School Graduate	144 (67.3)	73 (65.2)	37 (86.0)	34 (57.6)
Maternal Substance Use**[b]				
Past year drug/alcohol use	36 (16.8)	15 (13.4)	9 (20.9)	12 (37.5)
Child Sex				
Female	104 (48.6)	57 (50.9)	20 (46.5)	33 (55.9)

Proportions differ significantly across IPV groups where noted;

* $p<.05$;

** $p<.01$

[a] Maternal age, race, employment, and education reported at the child's time of birth; substance use reported at 1st grade interview

[b] Missing data for some respondents.

Table 2

Unadjusted and adjusted associations between IPV and child problem behaviors (N=214)

	Internalizing Problem Behaviors		Externalizing Problem Behaviors	
	Unadjusted OR[a] (95% CI)	**Adjusted OR[b] (95% CI)**	**Unadjusted OR (95% CI)**	**Adjusted OR (95% CI)**
IPV Grade 1				
Zero	Reference	Reference	Reference	Reference
1–10	2.32 (1.06 – 5.10)*	2.62 (1.11 – 6.21)*	1.68 (0.72 – 3.91)	1.89 (0.75 – 4.79)
≥11	1.75 (0.84 – 3.66)	2.44 (0.93 – 6.40)	3.13 (1.52 – 6.42)**	4.16 (1.55 – 11.19)**
Maternal Age	1.31 (0.83 – 2.06)	1.69 (0.95 – 3.01)	1.31 (0.83 – 2.06)	1.83 (1.00 – 3.34)
Maternal Race	0.97(0.86 – 1.09)	1.01 (0.88 – 1.17)	0.90 (0.80 – 1.01)	0.96 (0.83 – 1.10)
Maternal Employment	0.60 (0.31– 1.13)	0.56 (0.27 – 1.17)	0.60 (0.31 – 1.13)	0.66 (0.31 – 1.38)
Maternal Education	0.93 (0.48 – 1.79)	0.94 (0.40 – 2.19)	0.74 (0.39 – 1.42)	0.75 (0.31 – 1.80)
Maternal Substance Use	2.55(1.19 – 5.50)*	2.24 (0.93 – 5.37)	1.32 (0.58 – 3.02)	0.85 (0.32 – 2.26)
Child Sex	1.13 (0.61 – 2.11)	1.49 (0.72 – 3.08)	1.53 (0.82 – 2.87)	1.32 (0.63 – 2.78)
CPS Reports 24 mos.	1.44 (0.53 – 3.92)	0.91 (0.25 – 3.31)	2.51 (0.82 – 7.65)	1.67 (0.35 – 7.83)
CPS Reports 4–9 yrs.	1.44(0.65 – 3.21)	1.64 (0.64 – 4.17)	1.99 (0.92 – 4.33)	1.67 (0.65 – 4.28)
Previous IPV				
Zero	Reference	Reference	Reference	Reference
1–10	2.64 (1.20 – 5.79)*	2.61 (1.07 – 6.36)*	2.13 (0.96 – 4.74)	1.66 (0.66 – 4.14)
≥11	1.19 (0.56 – 2.49)	1.24 (0.53 – 2.88)	1.40 (0.68 – 2.89)	0.79 (0.32 – 1.94)

* $p < .05$;

** $p < .01$

[a] Calculated using logistic regression models without covariates

[b] Calculated using multivariable logistic regression