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The Relationship Between Maternal Domestic Violence and Infant and Toddlers' Emotional Regulation: Highlighting the Need for Preventive Services

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Abstract

In an effort to further understand the impact of domestic violence (DV) on infant and toddlers' development, this research utilized data from the second cohort of National Survey of Child and Adolescent Well-Being (NSCAW II) to examine the relationship between maternal DV and infant and toddlers' emotional regulation, and determine whether mothers' receipt of DV services mediated this relationship. The sample was limited to children aged 0 to 3 years and included (a) infants less than 1 year old (n = 603), (b) infants 1 to less than 2 years old (n = 310), and (c) toddlers 2 to 3 years old (n = 268). Infant/toddlers' emotional regulation was measured using mothers' response on the How My Infant/Toddler/Child Usually Acts questionnaire. In addition, data were collected to assess whether (a) active DV was present during the time of the Child Protective Services (CPS) investigation and (b) mothers received DV services during the past year. Study research

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questions were examined using a series of multiple regression analyses. Mediation was tested based on Baron and Kenny's recommended model for establishing mediation. The mediational model was not found to be significant; however, a positive relationship existed between maternal DV and emotional regulation among infants aged less than 1 year old ($\beta = 1.61$, $p = .039$). There were no statistically significant relationships between DV and emotional regulation in the other age groups. These findings highlight the need to provide CPS-involved families victimized by DV with services that focus on preventing poor infant emotional regulation.

Keywords
domestic violence, intimate partner violence, child welfare services, infant and toddler emotional regulation

Introduction

Domestic violence (DV), defined as physical, psychological, or sexual abuse by a spouse or intimate partner (Carpenter & Stacks, 2009), is a serious public health concern and has negative effects on children and their families. Estimates show 15.5 million children within the United States resided in families that experienced DV at least once in the past year; furthermore, 7 million children have experienced severe DV in their homes in the same time frame (McDonald, Jouriles, Rosenfield, Briggs-Gowan, & Carter, 2007).In a global prevalence study reported by UNICEF (2010), it was found that DV occurs at a higher rate in households with younger children. In addition, women are at a higher risk for abuse during pregnancy and the months that follow birth (Burke, Lee, & O'Campo, 2008).

The number of younger children living in a household with DV is especially concerning when considering research that shows negative effects of DV on infant and toddlers' social-emotional development. Many researchers have reported that DV negatively affects infant and toddlers' internalizing and externalizing behaviors (DeJonghe, von Eye, Bogat, & Levendosky, 2011; Levendosky, Leahy, Bogat, Davidson, & von Eye, 2006).

Unfortunately, there is less research available on the relationship between DV and infant and toddlers' emotional regulation (e.g., temperament, expression of distress, heart rate). Understanding this relationship is especially important when considering younger age groups because their brains are rapidly developing, especially in the frontal lobe, which is largely responsible for emotional regulation. Researchers have found that infants' brain development is more vulnerable to negative maternal influences (e.g., maternal

negative affect, lack of maternal response) and negative maternal influences can interfere with the neurological groundwork of their emotional regulation (Nelson & Bosquet, 2004).

In an effort to further understand the impact of DV on infant and toddlers' development, we examined the relationship between maternal DV and infant and toddlers' emotional regulation using a sample of mothers and children (aged 0-3 years) involved with Child Protective Services (CPS). Given the well-established literature that suggests DV and child maltreatment are co-occurring epidemics (e.g., Edleson, 1999; English, Edleson, & Herrick, 2005; Zolotor, Theodore, Coyne-Beasley, & Runyan, 2007) and 45% of CPS-involved mothers nationwide reported they experienced at least one act of physical DV during their lifetime and 29% in the past year (Hazen, Connelly, Kelleher, Landsverk, & Barth, 2004), this is an ideal sample to study this relationship.

Infant and Toddlers' Emotional Regulation and DV

Emotional regulation is defined as "the learned ability to adapt and manage feeling states and physical arousal levels in response to stimuli" (Carpenter & Stacks, 2009, p. 833). Past studies have measured emotional regulation among infants and toddlers by examining temperament, expression of distress, heart rate, physiological change, vagal tone, behavioral reactivity, and behavioral regulation (Cole, Martin, & Dennis, 2004; DeJonghe, Bogat, Levendosky, von Eye, & Davidson, 2005; Stifter, Spinrad, & Braungart-Rieker, 1999).

An infant or toddler's ability to self-regulate during times of stress or trauma can be drastically altered by the absence of the caregiver or the caregiver's inability to protect the child (Kaufman & Henrich, 2000). Disrupted emotional regulation can be evidenced as hyperarousal symptoms such as temper tantrums, inconsolable crying and/or frustration, and other types of behavioral or adjustment problems. Among the few studies that have examined the relationship between DV and infant and toddlers' emotional regulation, it appears DV increases the occurrence of behavioral problems, adjustment problems, and hypervigilance in infants and toddlers (DeJonghe et al., 2005; Kaufman & Henrich, 2000; Levendosky et al., 2006; McDonald et al., 2007). For example, McDonald and colleagues (2007) found that children aged 1 to 3 years old exposed to DV and/or angry adult conflict were at an increased risk for adjustment problems. Similarly, DeJonghe, Bogat, Levendosky, von Eye, and Davidson (2005) found that 1-year-old infants exposed to DV were more sensitive to adult verbal conflict than those not exposed to DV, as displayed through infant distress.

Therefore, DV may negatively affect infant and toddlers' emotional regulation; however, studies examining this relationship were conducted using small sample sizes, and families who are at the highest risk of more frequent and severe DV were underrepresented (DeJonghe et al., 2005; McDonald et al., 2007). Consequently, it is difficult to understand whether these findings apply to most infants and toddlers exposed to DV. Furthermore, although extremely valuable, most of the current studies examining DV and infant and toddler emotional regulation have not considered factors that may mediate this relationship. Levendosky and colleagues (2006) studied the possible mediating effect of maternal functioning on infant externalizing behavior in families exposed to DV. They found maternal functioning (i.e., maternal mental health and parenting) mediates the effects of DV on infants' externalizing behavior. Thus, it appears DV services and/or interventions targeting maternal functioning may improve infant and toddlers' socioemotional outcomes; however, whether this is the case is uncertain.

Mothers' Receipt of DV Services and Child Social Emotional Well-Being

Given their involvement with CPS, many CPS-involved mothers exposed to DV are uniquely positioned to receive services to help address their DV. For example, Ogbonnaya and Kohl (2016) found that slightly over half of CPS-involved female caregivers (50.81%) with active reports of DV were referred to DV services and, of these caregivers, 18.88% received DV services. Services provided to mothers who experience DV may include crisis services (e.g., telephone hotlines), health advocacy, legal advocacy, support groups, individual counseling, and shelter services (Macy, Giattina, Sangster, Crosby, & Johns Montijo, 2009). It is hoped that these services will improve maternal functioning which, in turn, will improve child well-being outcomes (Levendosky et al., 2006); however, limited research exists to support this notion (Grip, Almqvist, & Broberg, 2012).

One study that did examine the effects of mothers' receipt of DV services on child well-being outcomes found that mothers' perception of their children's behavioral functioning significantly improved following their and their children's participation in a community-based program for DV (Grip et al., 2012). However, this study was conducted using a small nonrepresentative sample of older children (aged 15-14) and their mothers (n = 46). In addition, this study did not disentangle the effects of mothers' receipt of DV services from children's receipt of DV services. Thus, it is unclear whether such study findings may be extrapolated to younger children exposed to DV and, if so, how much of an effect maternal DV services may have on child outcomes relative to child DV services.

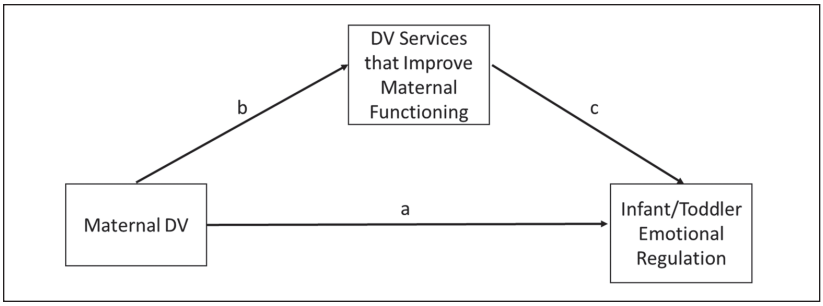

Figure 1. Analytic model for mediating effect of DV services on the relationship between maternal DV and infant/toddlers' emotional regulation.
Note. DV = domestic violence.

Current Study

The purpose of this study is to investigate the relationship between maternal DV and CPS-involved infant and toddlers' emotional regulation, and how maternal receipt of DV services influences this relationship. Specifically, we sought to answer the following research questions:

> **Research Question 1:** What is the relationship between maternal physical DV and infant and toddlers' emotional regulation?
> **Research Question 2:** To what extent does maternal receipt of DV services mediate the relationship between DV and infant and toddlers' emotional regulation?

As indicated in Figure 1, we hypothesized that (a) maternal DV will increase risk of poor infant and toddler emotional regulation; (b) DV will increase chances of mothers' receipt of DV services that improve maternal functioning; and (c) maternal receipt of DV services that improve maternal functioning will decrease risk of poor infant and toddler emotional regulation. Finally, for mediation to be present, we hypothesized that the strength of the main relationship (labeled as [a] in Figure 1) will be significantly reduced when the mediating variable, DV services, is introduced to the overall relationship (Baron & Kenny, 1986).

Method

Sample Design and Procedures

We used existing data from the second cohort of the National Survey of Child and Adolescent Well-Being (NSCAW II). Children with caregivers who were

investigated by CPS agencies were included in the NSCAW II sample. NSCAW II employed a two-stage stratified sample design. The first stage involved randomly selecting 81 primary sampling units (PSUs) across 30 U.S. states, with each PSU typically representing a county. Eight states were excluded from the study due to their law requiring the first contact be by a CPS worker, as opposed to an NSCAW Field Representative. The second stage entailed random selection of 5,872 children (aged birth-17.5 years) from the PSUs. These children's caregivers were investigated by CPS for potential child abuse or neglect during the months February 2008 through April 2009. Excluded were children aged 17.5 years or older, children with siblings involved in the study, children who were perpetrators of the investigated child maltreatment, or possible duplicate children (such as children investigated in the previous month). Children and infants placed in out-of-home care were over-sampled for statistical reasons. To account for this uneven probability selection and item nonresponse, weighting was done, thus making the PSUs nationally representative.

NSCAW II data were collected from multiple respondents, including CPS caseworkers, children, caregivers, and CPS directors. These data were collected across three time points: baseline, 18 months follow-up, and 36 months follow-up. However, the current study used only baseline data collected from caregivers and caseworkers.

Analytic Sample

Although the entire NSCAW II sample included 5,872 children, we limited our sample to children aged 0 to 3 years who (a) remained in the home following the child maltreatment investigation, (b) had a female caregiver (hereinafter referred to as mother), and (c) had a caseworker report of whether or not active DV was present during the time of the investigation. We limited the sample in this way given the focus of our study is maternal DV. Furthermore, over 90% of caregivers in NSCAW are female. Our inclusion criteria led to the exclusion of 3,390 cases with children over age 3 years, children in out-of-home placement, children with missing reports on caseworker report of active DV, and/or children with males as the primary caregivers. In addition, to maintain the integrity of the data by reporting the most accurate results, we elected to leave missing data as missing and to use a subpopulation analysis technique in which cases that have missing fields on key variables (n =1,300) are given weights set to zero. This analytic technique allowed the NSCAW II sampling weights used to produce estimates that retain accurate variance estimations for the subpopulation (cases) of 1,182 infants and toddlers included in the final analysis (Bell, Kromrey, & Ferron, 2009; West, Berglund, & Heeringa, 2008)

Institutional Review Board Approval

The study received an exemption from review as a secondary data analysis from the Institutional Review Board of the University where the researchers were associated.

Measures

Dependent variable: Infant and toddler emotional regulation. The How My Infant/Toddler/Child Usually Acts questionnaire, developed for the National Longitudinal Survey of Youth (Center for Human Resource Research, 2000), was used to measure infant and toddlers' emotional regulation. Items on this questionnaire were primarily taken from the Infant Behavior Questionnaire (IBQ; Rothbart, 1981; Worobey & Blajda, 1989), a questionnaire that has been found to be a valid measure of temperament (Rothbart, Derryberry, & Hershey, 2000). The How My Infant/Toddler/Child Usually Acts questionnaire was administered to caregivers of children aged 0 to 3 years old to measure the temperament of infant/toddlers. Questions varied depending on age appropriateness and were categorized as follows: (a) infants less than 1 year old (e.g., During feeding, how often does the child squirm or kick?), (b) infants 1 to less than 2 years old (e.g., How often does the child play alone with his or her favorite toy for 10 min or longer?), and (c) toddlers 2 to 3 years old (e.g., While watching a favorite television program, how often does the child watch for only a few minutes before becoming restless?). The caregivers responded to items using a 5-point Likert-type scale: 1 = *never/almost never*, 2 = *less than half the time*, 3 = *half the time*, 4 = *more than half the time*, 5 = *almost always*. For the purpose of this study, we created a composite score by summing item responses for mothers of infant/toddlers in each of the age categories. Thus, there were three separate composite scores. Furthermore, positively worded items were reverse-coded for analysis; therefore, higher scores represent more difficult temperament. Our study had a Cronbach's alpha ranging from .62 (children aged less than 1 year) to .69 (children aged 2-3 years old), indicating a satisfactory level of internal consistency.

Independent variable: Caseworker report of active DV. Caseworkers reported on whether mothers were experiencing active DV during the time of the investigation, using a caseworker survey developed by NSCAW to assess risk factors determining case decisions. Specifically, caseworkers were asked the following related to active DV: "At the time of the investigation, was there active DV?" (yes or no). Risk assessments were conducted 2 to 6 months after the child maltreatment investigation. This allowed enough time to determine

whether potential risks existed. Furthermore, all caseworker interviews were conducted in-person at the CPS agency, which made it easier for caseworkers to access confidential case records. This measure was used in lieu of mothers' report of DV that occurred during the past year, because it allowed us to measure DV during a time frame that children aged less than 1 year may have been within sight or sound of the violence (i.e., exposed to maternal DV).

Mediator: DV services. DV services was measured by asking mothers with or without an active DV report, "In the last 12 months, have you stayed in a battered women's shelter or received any other DV services to help you deal with an abuse partner?" (yes or no).

Control variables. Control variables were selected based on important variables identified in the literature as significant correlates for infant and toddlers' behavior (Harper, Ogbonnaya, & McCullough, 2018; Levendosky et al., 2006). These variables included maternal functioning (i.e., severe DV, depressive symptoms, parenting quality, and child maltreatment), child's gender, child's age, child's race/ethnicity, mother's education, mother's marital status, number of children in household, and family poverty level. Poverty level was measured using an NSCAW-derived calculation of the family's poverty percentage rate based on the 2010 U.S. Department of Health and Human Services poverty guidelines (Administration for Children and Families, 2011).

Severe DV. Maternal reports of past-year (i.e., recent) physical DV were measured by using the Conflict Tactics Scale–2 (CTS-2; Straus, 1990) Physical Abuse subscale. This instrument was delivered through a computer-assisted audio self-interview. The CTS-2 Physical Abuse subscale measures incidence and frequency of physically abusive actions among intimate partners, such as grabbing, throwing something at, or hitting a partner. CTS-2 also identifies acts of severe DV physical abuse as those that could cause greater injury and/or medical attention (e.g., partner burned you on purpose or twisted your arm). Mothers were identified as experiencing severe DV if they reported experiencing at least one severe physical abuse behavior within the past year. The CTS-2 has been proven reliable and valid with high-risk postpartum women ($\alpha = .67$-$.86$; Newton, Connelly, & Landsverk, 2001).

Maternal depressive symptoms. Maternal depressive symptoms were measured using the Composite International Diagnostic Interview–Short Form (CIDI-SF; Kessler, Andrews, Mroczek, Ustun, & Wittchen, 1998). This instrument includes a 21-item measure to assess symptoms of major depression based on the criteria from the *Diagnostic and Statistical Manual*

of Mental Disorders (4th ed.; *DSM-IV*; American Psychiatric Association [APA], 1994). Mothers were classified as having major depressive symptoms if they responded yes to any one of the following screening categories: (a) have dysphoric mood (feeling sad, blue, or depressed) in a 2-week period during the past 12 months, (b) have anhedonia (lack of enjoyment of any activity) for most of the day in a 2-week period during the past 12 months, or (c) take medication for depression. In addition to reporting one of the three screening criteria, mothers had to report three or more of the following depressive symptoms to qualify as having symptoms of major depression: gain or loss of weight, increased or decreased sleep, feelings of guilt or worthlessness, diminished ability to concentrate, and recurring thoughts of death or suicide. CIDI-SF has been found to have an interrater reliability ranging from .67 to 1 (Andrews, Peters, Guzman, & Bird, 1995; Wittchen et al., 1991) and concordance with clinical diagnoses ranging from .76 to .84 (Janca, Robins, Bucholz, Early, & Shayka, 1992).

Maternal parenting quality. The Home Observation for Measurement of the Environment–Short Form (HOME-SF; Baker, Keck, Mott, & Quinlan, 1993) inventory was used to measure maternal parenting quality. The behavior of the mother toward the child and the physical environment were evaluated (e.g., size of living space, safe play environment) using two subscales for children 0 to 36 months that assessed (a) child's cognitive stimulation and (b) emotional support. The sum of the scores from the two subscales was used to create a total score, with higher HOME-SF scores signifying better parenting qualities. Past research indicates internal consistency for HOME-SF ranged from .30 to .80, and interrater reliability was 85% or greater (Bradley, 1994).

Child maltreatment type. Interviews were conducted with the caseworkers to identify the most severe type of child maltreatment that resulted in the child's inclusion in the NSCAW II study using the Modified Maltreatment Classification System (MMCS; English & the Longitudinal Studies of Child Abuse and Neglect Investigators, 1997). This instrument includes specific questions about the nature of alleged abuse and/or neglect. All types of child maltreatment were reported for each child by the caseworker in the case report. After recording all types of child maltreatment, caseworkers used the MMCS to identify which maltreatment they perceived as the most serious type.

Statistical Approach

We conducted both bivariate and multivariate analyses. Bivariate analyses were used to compare infants and toddlers with mothers who did and did not

have a report of active DV on demographic characteristics, maternal functioning, and DV service receipt. Specifically, we conducted *f*-test analyses for categorical variables and *t* tests for continuous variables. Next, we tested our study hypotheses using a series of multiple regression analyses. Mediation was tested based on Baron and Kenny's (1986) recommended model for establishing mediation. According to this model, for each regression analysis conducted, a statistically significant relationship must exist between (a) independent (DV) and outcome (infant and toddler emotional regulation) variables, (b) proposed mediator (DV services) and outcome variables, and (c) independent and mediator variables. Finally, to conclude that mediational relationship exists, (d) the strength of the relationship originally found between the independent and dependent variables must be reduced or eliminated after controlling for the mediator. To ensure the most parsimonious model and include variables with the greatest explanatory power, regression models only included control variables that were statistically significant ($p < .05$) in bivariate analyses comparing mothers with and without caseworker reports of active DV. Identical procedures were applied on the data from the following subsamples, congruent to the emotional regulation measure: (a) infants less than 1 year old, (b) infants 1 to less than 2 years old, and (c) toddlers 2 to 3 years old. All analyses were conducted using the sampling weights designed for NSCAW II. Therefore, study findings may be generalizable to all infants and toddlers aged 0 to 3 years whose mothers were investigated for child maltreatment by CPS and remained in the home with their mothers following the investigation. In some cases, unweighted sample sizes are presented to provide information about the amount of data on which analyses were based. Data in this study were analyzed using Stata 13 statistical software package.

Results

Sample Description

Bivariate analyses displayed significant differences in the characteristics of mothers of infants and toddlers who did (*unweighted n* = 249; *weighted percentage*: 17.18%) and did not (*unweighted n* = 933; *weighted percentage*: 82.82%) have a caseworker report of active DV. The two groups were similar in regard to their parenting quality, number of children in the home, child's age, child's gender, child's race, depressive symptoms, and poverty level (see Table 1). However, the two groups were significantly different in regard to DV service receipt, marital status, education, primary maltreatment type, and severe DV ($p < .05$). Explicitly, mothers with a caseworker report of active DV were more likely to receive DV services than mothers without a caseworker

Table 1. Sample Characteristics of Mothers.

	Total *n* = 1,182	DV *n* = 249	No DV *n* = 933	
	(%)	(%)	(%)	*p* Value
Age (in years)	*M* (*SE*) 1.59 (0.08)	*M* (*SE*) 1.71 (0.14)	*M* (*SE*) 1.57 (0.09)	.3824
Parenting	*M* (*SE*) 15.58 (0.20)	*M* (*SE*) 15.89 (0.58)	*M* (*SE*) 15.52 (0.23)	.5901
Race/ethnicity				.2266
White	34.82	29.13	36	
Hispanic	31.47	39	29.9	
African American	27.92	22.05	29.14	
Other	5.8	9.82	4.96	
Major depressive symptoms	26.83	29.37	26.3	.6191
Child gender (male)	56.51	51.36	57.58	.5346
Education				.0437
No degree	28.49	26.46	28.91	
High school/GED	48.53	39.16	50.48	
Vocational/associate	14.59	13.62	14.79	
Bachelor's degree or other	8.39	20.76	5.82	
Child maltreatment type				.0000
Physical abuse	13.52	5.75	15.13	
Neglect—Failure to provide	13.56	17.77	12.69	
Neglect—Lack of supervision	25.87	13.5	28.44	
Substance exposure	5.54	0.47	6.59	
Substance using parent	14.05	9.48	15	
DV	9.68	31.25	5.21	
Other	17.78	21.78	16.95	
Number of children				.5673
1 child	34.13	23.21	36.4	
2 children	25.3	25.96	25.16	
3 children	22.45	27.94	21.31	
4 children	7.6	9.69	7.16	
≥5 children	10.53	13.21	9.97	
Marital status				.0017
Married	24.21	11.31	26.88	
Separated	10.66	24.7	7.74	
Divorced or widowed	10.74	7.46	11.43	
Never married	54.39	56.53	53.95	
Federal poverty level				.128
<50%	28.86	18.77	30.95	
50%-<100%	38.82	39.93	38.59	
100%-200%	23.19	34.72	20.8	
>200%	9.13	6.59	9.65	
DV service receipt	4.89	10.94	3.64	.0183
Severe DV	22.24	45.47	17.42	.0001

Note. Unweighted sample size is reported; however, proportions and means are based on weighted data; GED certificate, equivalent to a high-school diploma; *f* tests were conducted on the categorical variables, and *t* tests were conducted on the variables caregiver age and parenting. DV = domestic violence; GED = General Educational Development.

report of active DV, $F(1, 74) = 5.83$, $p = .02$. Furthermore, they were more likely to have a bachelor's/other degree and less likely to be married ($p < .05$). In terms of primary maltreatment type, unsurprisingly, mothers with a caseworker report of active DV were more likely to have DV as the alleged primary maltreatment type compared with mothers without a caseworker report of active DV. However, they were less likely to have physical abuse, neglect (lack of supervision), and substance exposure as alleged primary maltreatment types ($p < .05$). Finally, mothers with a caseworker report of active DV were more likely to report experiencing severe DV than mothers without a caseworker report of active DV, $F(1, 74) = 16.33$, $p = .0001$.

Emotional Regulation

Weighted mean scores for emotional regulation indicate that, on average, children aged 2 to 3 years old (*unweighted n* = 268) were reported by their mothers as having had the highest level of emotional regulation problems (*weighted M* = 91.26, *SE* = .86). Following were children aged 1 year to less than 2 years old. Children aged 1 year to less than 2 years old (*unweighted n* = 310) had a weighted mean emotional regulation score of 56.89 (*SE* = 0.66); whereas infants less than 1 year old (*unweighted n* = 603) had a weighted mean score of 44.30 (*SE* = 0.71).

Mediation analyses. In support of our first hypothesis, maternal DV will increase risk of poor infant and toddler emotional regulation, we found a direct relationship between DV and emotional regulation among children less than 1 year old (see Figure 2). Specifically, other things being equal, mothers with infants in this age group who had a caseworker report of active DV reported higher levels of infant emotional regulation problems, by approximately 1.61 units ($p = .039$), than mothers with infants in this age group without a caseworker report of active DV. However, given that there was no significant relationship between (a) maternal DV and DV services ($\beta = 0.47$, $p = .431$) and (b) DV services and infants' emotional regulation ($\beta = 0.91$, $p = .418$), we were unable to conclude that DV services mediated the relationship between maternal DV and infants' emotional regulation.

As indicated in Figures 3 and 4, there were no statistically significant relationships between maternal DV and infant and toddlers' emotional regulation in the other age groups (infants 1 to less than 2 years old; toddlers 2-3 years old).

Discussion

The current study examined the relationship between maternal DV and emotional regulation among three different age groups of infants and toddlers: (a)

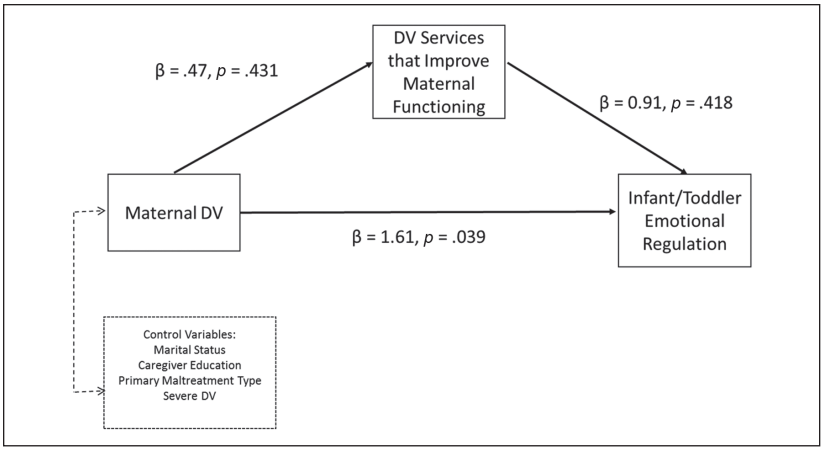

Figure 2. Mediating effect of DV services on the relationship between maternal DV and infant/toddlers' emotional regulation for children less than 1 year.
Note. DV = domestic violence.

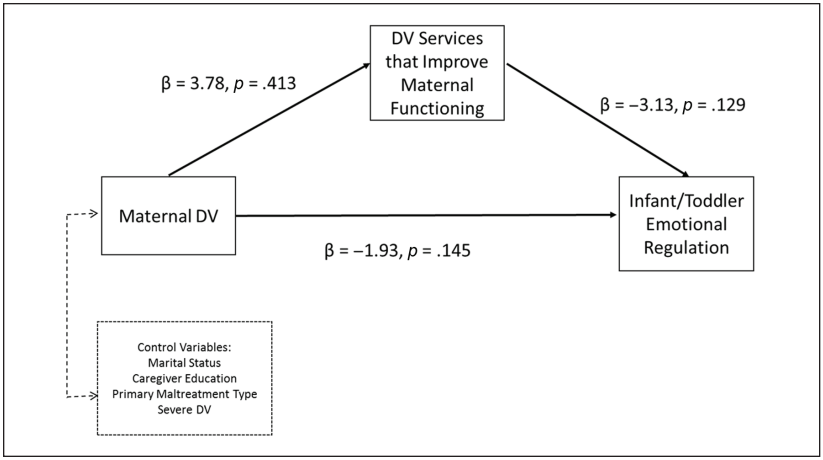

Figure 3. Mediating effect of DV services on the relationship between maternal DV and infant/toddlers' emotional regulation for children 1 to less than 2 years.
Note. DV = domestic violence.

infants less than 1 year old, (b) infants 1 to less than 2 years old, and (c) toddlers 2 to 3 years old. Approximately 17% of mothers in our sample had a caseworker report of active DV, falling within the range of 11% and 60% found in past studies (Ogbonnaya & Kohl, 2018; Whitney & Davis, 1999).

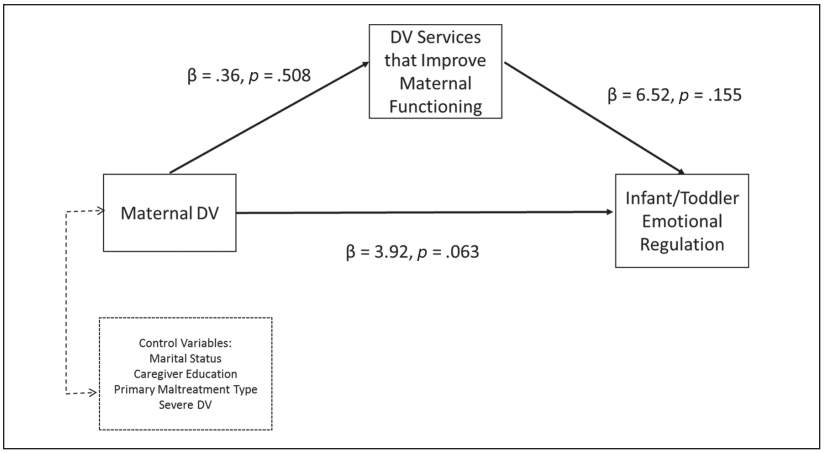

Figure 4. Mediating effect of DV services on the relationship between maternal DV and infant/toddlers' emotional regulation for children 2 to less than 3 years.
Note. DV = domestic violence.

Findings also revealed a positive relationship between maternal DV and emotional regulation, but only among children aged less than 1 year. This finding aligns with findings from past research that suggests DV is associated with infant and toddlers' emotional regulation (e.g., DeJonghe et al., 2005; Kaufman & Henrich, 2000; Levendosky et al., 2006; McDonald et al., 2007). However, the current study is the first of its kind to find a relationship between DV and emotional regulation among children (a) younger than 1 year and (b) involved with CPS, thereby providing new knowledge to the child welfare and DV literature.

In addition, we wanted to understand whether the relationship between maternal DV and infant and toddlers' emotional regulation was mediated by mothers' receipt of DV services. Our findings showed no evidence of such a relationship. Because we defined DV services as services received during the past 12 months, mothers in the study with infants less than 1 year old who received DV services may have received services either (a) before giving birth to their infants or (b) before they were pregnant with their infants. Therefore, because many services offered to DV victims are not preventive in nature and rather focus on addressing victims' immediate needs (Macy et al., 2009), it is likely the DV services offered to mothers with infants less than 1 year old did not focus on infants' emotional regulation. This is problematic given that optimizing the quality of caregiving can prevent poor child outcomes (National Research Council and Institute of Medicine, 2000).

Furthermore, if unresolved, emotional regulation problems during later developmental stages may lead to peer relationship difficulties, disorderly behavior, lower levels of social competence, and aggressiveness, particularly true for maltreated children (Shields, Cicchetti, & Ryan, 1994; Shields, Ryan, & Cicchetti, 2001; Teisl & Cicchetti, 2008). Knowing these risks and considering our research findings, we recommend that women who experienced DV and are involved with CPS receive prevention and early intervention services that address poor child emotional regulation and target mothers-to-be, as well as mothers with infants. Services may include evidence-based DV interventions (California Evidence-Based Clearinghouse [CEBC], 2017) such as Child–Parent Psychotherapy (CPP) and Domestic Violence Home Visit Intervention (DVHVI). Because many DV-exposed mothers are involved with CPS (Hazen et al., 2004) and children under the age of 3 have the highest rates of CPS involvement (Diaz & Petersen, 2014), these types of services are especially relevant to child welfare populations.

It is also possible we did not find support for our hypothesis that DV services mediate the relationship between maternal DV and infants' emotional regulation because of how DV services were measured in the current study. The NSCAW's broad definition of DV services did not allow us to compare whether some types of DV services may be more effective at decreasing the risk of poor infant/toddlers' emotional regulation than others. As previously mentioned, DV services are enormously varied. Future research examining how DV services influence the relationship between maternal DV and infant and toddlers' emotional regulation should do so using measures that identify the specific types of DV services mothers received.

Although our research adds to the current DV and child welfare knowledge base, it is not without limitations. First, researchers have confirmed CPS caseworkers under-identify DV in about two thirds of the cases in which mothers reported DV for the previous 12 months (Casanueva, Smith, Ringeisen, Dolan, & Tuller, 2014). Consequently, by using caseworker reports to measure DV, we may be missing a multitude of women who experienced DV. Second, we acknowledge we had a considerable amount of missing data. Although the subpopulation analysis approach we used allowed us to analyze the data in the most accurate way, selection bias may exist due to missing data. For example, we may be missing a unique group of women victimized by DV, such as women with more severe DV experiences who decided not to respond to study questions for fear of DV-related repercussions. Third, because we were limited by the NSCAW data, we were unable to control for other factors, such as maternal DV–related posttraumatic stress disorder (PTSD), shown to be predictive of emotional regulation among children exposed to DV. Future research examining how DV services influence

the relationship between maternal DV and infant and toddlers' emotional regulation should do so controlling for PTSD. Furthermore, future research should consider other types of mediation analysis that extend beyond Baron and Kenny's approach by not only testing for complete mediation (yes or no) but also examining the size of the indirect effect despite the absence of a direct effect and the effect of potential latent variables (e.g., structural equation modeling). Last, our study did not examine the effect of DV services on infant and toddlers' emotional regulation over time. We recommend research that longitudinally examines this relationship. Doing so would allow more power in detecting causal relationships than the cross-sectional method used in this study.

Conclusion

Our finding that the risk of poor emotional regulation persists among infants less than 1 year old, despite mothers' receipt of DV services, suggests current DV services offered to mothers overlook the negative impacts of DV on very young children, particularly infants. This may be due to the fact that infants are unable to communicate their needs through language. We recommend that, in addition to focusing on mothers' immediate needs, CPS providers offer DV-affected mothers with prevention and early intervention services that address poor infant emotional regulation. Otherwise, long-term consequences (e.g., peer relationship difficulties, disorderly behavior, lower levels of social competence, and aggressiveness) that impede children's socioemotional growth are likely to occur.

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