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Regular Article

Breastfeeding continuation at 6 weeks postpartum remediates the negative effects of prenatal intimate partner violence on infant temperament

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Abstract

Very little work has examined potential moderating effects in the link between prenatal intimate partner violence (IPV) and infant adjustment, especially in the first critical weeks following delivery. The current study evaluated the protective role of breastfeeding in the relationship between prenatal IPV and infant temperament at 4 months. Pregnant women ($n = 82$) were interviewed during pregnancy and at 6 weeks and 4 months postpartum. It was hypothesized that (a) prenatal IPV would predict infant temperament outcomes at the 4-month postpartum visit, and (b) breastfeeding continuation at 6 weeks acts as a protective factor such that breastfed infants will be less affected by the risk posed by prenatal IPV. Results indicated direct and negative effects of prenatal IPV on positive affectivity/surgency and orienting/regulatory capacity at 4 months. A significant moderating effect of breastfeeding at 6 weeks postpartum was identified. Mothers who were not breastfeeding at 6 weeks postpartum demonstrated the expected negative relationship between prenatal IPV exposure and infant adjustment, but if mothers were breastfeeding at 6 weeks postpartum, the relationship between IPV exposure and infant positive affectivity/surgency and orienting/regulatory capacity was not significantly different from zero. Results indicate a significant protective effect of breastfeeding in the intergenerational transmission of risk for infants born to mothers exposed to IPV.

Keywords: adversity, domestic violence, infant adjustment, nursing, prenatal stress

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Intimate partner violence (IPV), defined as threatened or completed acts of psychological, sexual, or physical violence against a partner or spouse, is highly prevalent in the United States, occurring to approximately one in four women in their lifetime (Centers for Disease Control and Prevention [CDC], 2017). For victims, IPV has associated economic costs of approximately $103,767 due to adverse effects on mental and physical health, job productivity, and justice system costs (CDC, 2017; Peterson et al., 2018). Although many studies of IPV focus on sexual and physical forms of abuse alone, psychological forms of IPV have been found to be equally common, and in some studies, have been shown to be even more pernicious than physical forms of abuse (Coker et al., 2002; Thompson et al., 2006). Developmentally, risk for IPV exposure has been found to be especially high during pregnancy (Devries et al., 2010; Groves et al., 2015), and it is associated with numerous deleterious effects for both women and children, including higher rates of both antenatal and postpartum mental health symptoms, serious pregnancy complications, higher infant mortality, preterm birth, and low birth weight (Donovan, Spracklen, Schweizer, Ryckman, & Saftlas, 2016; Ferdos, Rahman, Jesmin, Rahman, & Sasagawa, 2018; Flanagan, Gordon, Moore, & Stuart, 2015; Hill, Pallitto, McCleary-Sills, & Garcia-Moreno, 2016; Kastello et al., 2016; Reichenheim, Moraes, Howard, & Lobato, 2017; Silverman, Decker, Reed, & Raj, 2006). Despite clear negative effects of IPV in pregnancy, surprisingly little longitudinal work conducted with this high-risk population exists, and even less examines processes whereby intergenerational risks are transmitted or remediated. The objective of the current study is therefore to examine the protective role of breastfeeding in the relationship between maternal prenatal IPV and infant temperament at approximately 4 months of age.

IPV and Infant Temperament

Infant temperament is defined as "constitutionally based individual differences in reactivity and self-regulation" (Rothbart, 1986, p. 356). Infant temperament has been shown to predict adjustment problems in early childhood, and easy temperament significantly attenuates the impact of environmental risk factors on consequent adjustment outcomes (Derauf et al., 2011; Sayal, Heron, Maughan, Rowe, & Ramchandani, 2014). Research on the effects of prenatal stress on infant temperament has demonstrated negative effects in the domains of self-regulation, fussy/

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difficult temperament, and effortful control but mixed effects on infant positive affectivity/surgency (Bush et al., 2017; Gartstein, Bridgett, Young, Panksepp, & Power, 2013; Laplante, Brunet, & King, 2015; Lin, Crnic, Luecken, & Gonzalez, 2014; Nolvi et al., 2016; Simcock et al., 2017). Both prenatal and postnatal IPV have been associated with infant fussy-difficult temperament (Burke, Lee, & O'Campo, 2008; Edhborg, Nasreen, & Kabir, 2017; Quinlivan & Evans, 2005). Research examining the relative contribution of prenatal versus postnatal IPV has demonstrated that prenatal IPV is a stronger predictor of both maternal-reported infant adjustment problems and biological assessments of infant adrenocortical reactivity to stress (Levendosky et al., 2016).

Breastfeeding and Infant Temperament

Although previous work on IPV exposure gives insight into mechanisms underlying the intergenerational transmission of risk, including depression and parenting behaviors (Levendosky, Leahy, Bogat, Davidson, & von Eye, 2006; Miller-Graff, Nuttall, & Lefever, 2018), far fewer studies have examined possible protective effects (i.e., moderating effects) in the link between prenatal IPV and infant adjustment. One of the earliest parent–child interactions following delivery is women's initiation of breastfeeding (Declercq, Labbok, Sakala, & O'Hara, 2009). Breastfeeding has numerous benefits for both maternal and infant health, including lower risk for developing cancer, type 2 diabetes, postpartum depression, and infant mortality (Chowdhury et al., 2015; Khan, Vesel, Bahl, & Martines, 2015). Beyond its effects on individual health for both mothers and infants, breastfeeding has also been shown to positively contribute to maternal sensitivity, attachment, and bonding (Himani & Kumar, 2011; Kim et al., 2011; Tharner et al., 2012). Research on breastfeeding, however, is more limited in its possible contribution to infant temperament. Some studies suggest that decreased breastfeeding is directly associated with difficult temperament in infants (Niegel, Ystrom, Hagtvet, & Vollrath, 2008) and alertness and irritability during feedings, even when controlling for maternal depression (Field, Hernandez-Reif, & Feijo, 2002). Maternal breastfeeding also positively contributes to later maternal sensitivity, which, in turn, was related to lower levels of negative emotionality in infants (Jonas et al., 2015).

Although no studies to date have evaluated the moderating effect of breastfeeding on the association between IPV and infant adjustment, other research demonstrating the moderating effects of biobehavioral regulatory factors (Bouvette-Tourcot et al., 2015; Martinez-Torteya, Bogat, Lonstein, Granger, & Levendosky, 2017) suggests the relevance of evaluating breastfeeding's potential to moderate the stress–adjustment link. Given that women exposed to prenatal IPV, while seemingly not less likely to initiate breastfeeding, are much more likely to cease breastfeeding in the first few weeks postpartum (Miller-Graff, Ahmed, & Paulson, 2018; Wallenborn, Cha, & Masho, 2018), evaluating the potential protective effects of short-term breastfeeding may be particularly relevant and may hold high public health significance.

Current Study

Prenatal IPV exposure has documented negative effects on infant temperament and development. Few studies, however, have examined biobehavioral factors that may provide insight into possible protective effects in the context of prenatal IPV. Given women exposed to IPV are both more likely to report having infants with difficult temperaments (Quinlivan & Evans, 2005) and more likely to cease breastfeeding early (Miller-Graff, Ahmed, et al., 2018; Wallenborn et al., 2018), gaining a better understanding of the possible protective role of breastfeeding in intergenerational cascades of risk and resilience stands to substantially impact practice and policy with high-risk women. To that end, the current study sought to examine the protective role of breastfeeding in a sample of low-income women at high risk for exposure to IPV. Specifically, it is hypothesized (see Figure 1) that

1. Prenatal IPV exposure will directly predict infant temperament outcomes (higher negative emotionality, lower positive affectivity/surgency, and lower orienting/regulatory capacity) at the 4-month postpartum visit.
2. Breastfeeding continuation at 6 weeks will moderate the relationship between IPV and infant temperament, such that breastfed infants will be less adversely affected by the risk posed by maternal prenatal IPV exposure.

Method

Participants

Women in the current study ranged in age from 18 to 39 (M = 26.53, SD = 5.35). Approximately half of the sample (45.12%) was in their first trimester at the baseline interview, with 34.15% entering the study in their second trimester, and 20.73% entering during their third trimester. Regarding educational attainment, 1.22% of women reported completing grade school or less, 18.29% completed some high school, 34.15% completed a high school degree or GED, 35.37% completed some college, and 10.98% completed college or any graduate education. Average monthly income was $1100.07 USD ($SD$ = 906.02). The sample was diverse: 39.02% of women identified as Black or African American, 36.59% identified as White or Caucasian, 19.51% identified as Hispanic or Latina, and 4.88% identified as biracial or multiracial. Regarding their current relationship status, 57.32% of the sample reported that they were single, 24.39% were married, 12.20% were living with a partner, 26.83% were divorced or separated.

Procedures

The current study includes data collected as part of a university partnership with the local Women, Infants, and Children (WIC) Food and Nutrition Service program. The study design and questionnaires were decided upon collaboratively by the research team and the clinic director. Protocol was approved by the institutional review boards of both the participating university and the hospital overseeing the local WIC office. Women were eligible to participate if they were at least 18 years of age and were fluent in either Spanish or English. The Spanish language survey was forward- and back-translated, with semantic discrepancies identified, discussed, and rectified by the translation team and the PI. Spanish language interviews were conducted by project staff with fluency in Spanish. One participant in the current study sample opted to complete the study in Spanish.

Women in the current study were recruited by trained project personnel, who provided a brief description of the study and a flyer during all WIC prenatal care appointments scheduled on days when an interviewer was available on site. In case partners attended appointments, the brief description did not include information regarding IPV assessment. The study was a convenience

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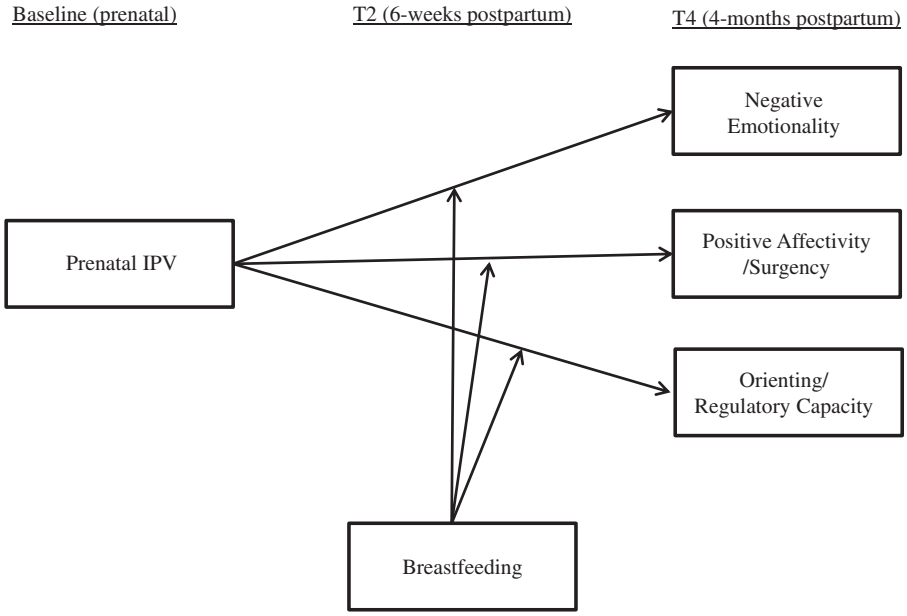

Figure 1. Hypothesized model. Controls include infant age and prenatal maternal depression.

sample, and percentage of women invited into the study but declining was not tracked. If women were interested in participating, they were invited into a private room to learn more about the study, including the assessment of adversity, and if interested, complete an informed consent. At baseline, all questionnaires were administered via interview. Each participant interview lasted 30–40 min; women were compensated a $10 gift certificate to a local grocery store. Following completion of the baseline interview, women's expected due dates were recorded to permit tracking for postpartum follow-up surveys, which were designed to coincide with women's regular postpartum visits at the WIC office at approximately 6 weeks and 4 months postpartum. Project staff were trained to leave minimal information in messages, not mentioning IPV or violence, and also never to leave messages with others who answer the phone. At follow-ups, all women were offered the opportunity to complete the survey via interview format, if desired, to make the study surveys accessible for women of all literacy levels, but the standard format for administration of the follow-up surveys was for women to complete surveys independently with a staff member available close by to answer any questions and check surveys for completion.

Measures

Demographics (baseline)

Participants completed a brief demographics survey for basic background information, including age, racial/ethnic background, educational attainment, and monthly household income.

Intimate partner violence (baseline)

IPV was assessed using 39 victimization items from the Revised Conflict Tactics Scale (CTS-2; Straus, Hamby, McCoy, & Sugarman, 1996) assessing physical assault, psychological aggression, sexual coercion, and injury. Women's perpetration of IPV was not assessed. The scale has established discriminant and convergent validity (Straus et al., 1996) and has been successfully used in numerous studies of IPV-exposed women. In the current study, the CTS-2 was scored using the midpoint method, which provides an estimate of IPV frequency in the past year, and subscales were summed to create a total IPV exposure score. Internal reliability for the current study was good ($\alpha = 0.89$).

Depressed mood (baseline)

Prenatal depressed mood was assessed using the Center for Epidemiological Studies Depression Scale (CESD; Radloff, 1977). The CESD includes 20 items assessing different aspects of depressed mood, such as loneliness, poor appetite, and restless sleep. The CESD has high internal consistency, retest reliability, and validity (Radloff, 1977). In addition to a total scaled score, the CESD also provides a suggested clinical cutoff, with scores of 16 or higher demonstrating clinically significant symptoms (Radloff, 1977). Internal reliability for the current study was good ($\alpha = 0.89$).

Breastfeeding (6 weeks postpartum)

Women's breastfeeding behaviors were assessed using the Pregnancy Risk Assessment and Monitoring System breastfeeding module (CDC, 2012). At 6 weeks postpartum, women were asked, "How many weeks or months did you breastfeed or pump milk to feed your baby?" Women reporting a duration of less than 6 weeks were coded as having early breastfeeding cessation (0), and women who were still breastfeeding at 6 weeks postpartum were coded as a 1. A few women in the sample were interviewed less than 6 weeks postpartum due to slight variation in postpartum appointment scheduling at the WIC office; if these women were currently breastfeeding, they were coded as 1. Previous studies on maternal self-report of breastfeeding practice have shown it to be valid within 3 years postpartum (Li, Scanlon, & Serdula, 2005).

Infant temperament (4 months postpartum)

At the 4-month postpartum follow-up survey, women completed the Infant Behavior Questionnaire—Revised—Very Short Form (IBQ-R-VSF; Putnam, Helbig, Gartstein, Rothbart, & Leerkes, 2014). This 36-item assessment asks caregivers to rate aspects of infant's temperament in three broad domains: positive affectivity/surgency, orienting/regulatory capacity, and negative emotionality. The positive affectivity/surgency scale includes items assessing infants' positive affect (e.g., smiling and laughter),

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vocalizations, activity level, and perceptual sensitivity. The orienting/regulatory capacity scale includes items assessing infants' orienting/attentiveness, soothability, and cuddliness. The negative emotionality scale includes items assessing sadness, distress, and fearfulness. The IBQ-R-VSF is designed for use with children between the ages of 3 and 12 months, with demonstrated reliability, validity, and relative stability across this time (Rothbart, 1981). The IBQ-R-VSF has been shown to converge well with the original measures and has strong test–retest reliability (Putnam et al., 2014). Internal reliabilities for the current study were good for positive affectivity/surgency ($\alpha = 0.86$) and negative emotionality ($\alpha = 0.86$), and slightly weaker for orienting/regulatory capacity ($\alpha = 0.63$).

Attrition

Women who completed at least one postpartum interview ($n = 82$) were included in the current study. Baseline differences between these women and the full sample ($N = 101$) were examined to identify any patterns in attrition over the course of the study. Women who completed at least one follow-up interview reported significantly higher household income at baseline ($t = -2.30$, $p < .05$). There were no significant differences between the retained and full sample on any other examined sociodemographic characteristic or study variable. Based on these analyses, data were determined to be missing at random (MAR). The optimal approach for handling data MAR is full information likelihood estimation, which successfully produces unbiased coefficient estimates in the case of MAR (Enders & Bandalos, 2001), including for small longitudinal samples (Shin, Davidson, & Long, 2017).

Analytic plan

In order to test the first hypothesis, a direct effects multivariate regression was conducted in Stata 14.0 using path modeling. The use of the path modeling macro permits for missing data to be handled using full information likelihood estimation, which was selected as the optimal approach given the characteristics of missing data in this sample. Total variance explained on each dependent variable (R^2) was used to assess the model's utility. Models included controls for infant age and maternal prenatal depression. To evaluate the second hypothesis, which postulated a moderating effect of breastfeeding continuation on the relationship between prenatal IPV and infant temperament, an interaction effect was added to the multivariate regression path model. The relative contribution of the moderation term to the overall model fit was evaluated using ΔR^2 and Cohen's f^2, where a change of .02 was considered to be a small effect, a change of .15 was considered to be medium effect, and a change of .35 was considered to be a large effect (Cohen, 1988; Henseler & Chin, 2010; Henseler & Fassott, 2010). Significant interactions were probed using simple slopes testing with complete test cases to determine the direction of the moderating effect. Power analyses conducted in GPower 3.3.10 indicated that to evaluate a R^2 increase attributable to the addition of a moderating term to the model (for a total of 5 predictors, including controls) with 80% power and $\alpha = 0.05$, a small-sized effect ($\Delta f^2 = .02$) would require a sample size of $n = 395$, a medium-sized effect ($\Delta f^2 = .15$) would require a sample size of $n = 55$, and a large effect would require a sample size of $n = 25$. The critical sample effect size with which a significant moderating term could be detected with the current sample size ($n = 82$) was $\Delta f^2 = .10$.

Table 1. Intimate partner violence exposure frequency by subscale

Variable	*M* (*SD*)	Range
Psychological aggression	19.06 (36.15)	0–175
Physical assault	6.78 (27.14)	0–169
Sexual coercion	4.09 (11.49)	0–62
Injury	1.22 (5.12)	0–34

Results

On average, women reported 31 events of IPV in the past year ($M = 30.85$, $SD = 68.53$; see Table 1). Only 18 women (21.9%) in the sample reported no IPV of any kind. Regarding prenatal depression, 34.1% ($n = 28$) of women in the current study were at or above the depressed mood clinical cutoff ($M = 14.63$, $SD = 10.68$). The vast majority of women in the sample (91.30%) initiated breastfeeding. Of women completing the 6 weeks postpartum interview ($n = 69$), 56.5% were still breastfeeding and 31.9% were breastfeeding exclusively (see Table 2 for descriptive statistics for all study variables).

Results of the multivariate regression model examining only the main effects explained a total variance of 31.3%, although the dependent variable of positive affectivity/surgency was better explained than negative emotionality and orienting/regulatory capacity ($R^2 = .19$, $R^2 = .04$, $R^2 = .06$, respectively). Results indicated IPV exposure during pregnancy predicted significantly lower levels of infant positive affectivity/surgency at 4 months postpartum ($\beta = -0.27$, $p < .01$). Prenatal IPV also was associated with orienting/regulatory capacity at 4 months postpartum, but only at $p < .10$ ($\beta = -0.20$, $p = .07$).

The addition of the hypothesized moderating effect of breastfeeding on the relationship between IPV and infant temperament improved overall model variance explained ($R^2 = .44$, $\Delta R^2 = .13$, $\Delta f^2 = .23$) with a medium effect size. There were also significant improvements in variance explained for both positive affectivity/surgency ($R^2 = .31$, $\Delta R^2 = .12$; $\Delta f^2 = .14$) and orienting/regulatory capacity ($R^2 = .18$, $\Delta R^2 = .16$; $\Delta f^2 = .23$), at small-to-medium and medium effect sizes, respectively. The variance explained for negative emotionality was unchanged and small ($R^2 = .04$; $\Delta R^2 = .00$). Results indicated breastfeeding significantly moderated the relationship between prenatal IPV exposure and infant adjustment for both positive affectivity/surgency and orienting/regulatory capacity ($\beta = 1.06$, $p < .01$; $\beta = 1.10$, $p < .01$, respectively; see Figure 2 and Table 3). Sensitivity analyses suggested that the direction and significance of results were the same when women with values of zero on the CTS-2 were omitted from the analyses, suggesting robustness of current study findings.

Simple slopes analyses indicated mothers who were not breastfeeding at 6 weeks postpartum demonstrated the expected negative relationship between prenatal IPV exposure and infant adjustment, such that higher rates of IPV were associated with lower levels of positive affectivity/surgency and orienting/regulatory capacity ($t = -3.86$, $p < .01$, $t = -3.44$, $p < .01$, respectively). In contrast, the relationship between IPV exposure and infant positive affectivity/surgency and orienting/regulatory capacity was not significantly different from zero for women who were still breastfeeding at 6 weeks, suggesting IPV exposure did not exert a negative effect on infant temperament at 4 months if mothers were still breastfeeding at 6 weeks postpartum.

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Table 2. Descriptive statistics and correlations for main study variables

	M (*SD*)	1.	2.	3.	4.	5.	6.	7.
1. Infant age (weeks)	7.17 (2.39)	1						
2. Maternal prenatal depression	14.63 (10.81)	.12	1					
3. Breastfeeding[a]	56.5%	−.05	−.01	1				
4. Prenatal intimate partner violence	30.85 (68.53)	.07	.16	−.04	1			
5. Negative emotionality	3.41 (1.20)	−.02	.06	−.03	−.14	1		
6. Positive affectivity/surgency	4.98 (1.12)	.16	−.10	−.13	−.33*	.34*	1	
7. Orienting/regulatory capacity	5.78 (1.32)	−.08	−.01	−.16	−.21^{x}	.19	.61**	1

Note: [a]1 = breastfeeding continuation at 6 weeks postpartum, 0 = not breastfeeding at 6 weeks postpartum; correlations with breastfeeding are point biserial. $^{x}p < .10$. *$p < .01$. **$p < .001$.

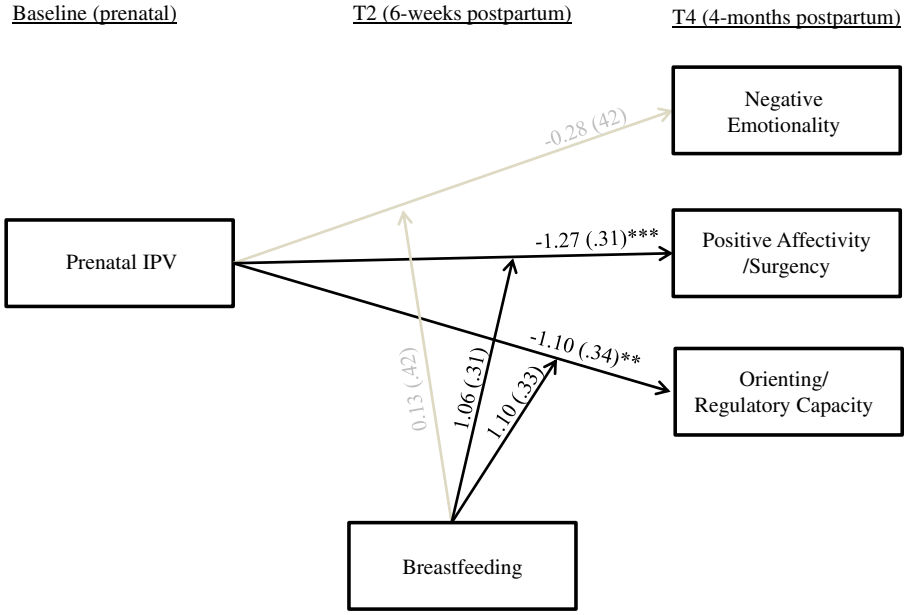

Figure 2. Full model. Controls include infant age and prenatal maternal depression. **$p < .01$. ***$p < .001$.

Discussion

Although prior studies support negative associations between IPV and infant temperament (Edhborg et al., 2017; Field et al., 2002; Niegel et al., 2008), this is the first study to probe breastfeeding as a potential protective factor against detrimental outcomes for infants associated with IPV during pregnancy. The assessment of diverse forms of prenatal IPV (i.e., physical, sexual, and psychological) represents a comprehensive picture of women's victimization in this period and is a significant strength of the current study. As expected, prenatal IPV exposure predicted lower levels of infant positive affectivity/surgency and orienting/regulatory capacity at 4 months postpartum, partially supporting the first hypothesis. IPV did not, however, predict infant negative affectivity. Although this differs from some previous work (Burke et al., 2008; Edhborg et al., 2017; Quinlivan & Evans, 2005), research is limited in this area, and the current results suggest continued evaluation of IPV's effects on infant temperament is warranted. It should also be noted that studies assessing difficult-fussy infant temperament often include indicators of positive affectivity and regulatory responses as part of this dimension (e.g., Burke et al., 2008). As such, it may be the results of the current study further illuminate specific aspects of infant temperament driving the overall relationship between IPV and difficult temperament.

It should be noted, however, that the effects of prenatal IPV on children's adjustment may also be indirect via maternal depression and parenting behaviors (Levendosky et al., 2006; Miller-Graff, Nuttall, et al., 2018). The current study is limited in its lack of data on relevant parenting factors, such as parenting practices and maternal sensitivity that may serve as indirect mechanisms by which IPV affects infant temperament. The null findings between IPV and infant negative affectivity should therefore be understood as a null direct effect; future studies should also consider indirect effects of IPV on infant temperament and how breastfeeding might intersect with these relationships.

Results also indicated breastfeeding moderated the relation between IPV and infant temperament for positive affectivity/surgency and orienting/regulatory capacity. That is, IPV exerted the expected, negative relationship with infant temperament in mothers not breastfeeding at 6 weeks, but continued breastfeeding moderated this negative effect to such an extent that the relationship between IPV and infant temperament for these mother–child dyads was not significantly different from zero. These results denote the relevance of IPV exposure during pregnancy for infant temperament and highlight breastfeeding as an important biobehavioral and relational protective factor and represents a novel

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Table 3. Multivariate regression analysis

	Negative emotionality		Positive affectivity/surgency		Orienting/regulatory capacity	
Direct effects model	β	95% CI	β	95% CI	β	95% CI
Infant age	−0.13	[−.39, .12]	0.28*	[.06, .51]	−0.03	[−.29, .22]
Maternal prenatal depression	0.05	[−.18, .28]	−0.005	[−.21, .22]	0.01	[−.21, .25]
Prenatal IPV	−0.16	[−.38, .07]	−0.27**	[−.47, −.07]	−0.20^{x}	[−.42, .02]
Breastfeeding[a]	−0.02	[.30, .27]	−0.11	[−.34, .12]	−0.15	[−.39, .10]
Coefficient of determination (R^2)	R^2 = .04		R^2 = .19		R^2 = .06	
Full model	β	95% CI	β	95% CI	β	95% CI
Infant age	−0.12	[−.38, .13]	0.33**	[.11, .54]	0.01	[−.23, .26]
Maternal prenatal depression	0.05	[−.19, .28]	−0.03	[−.23, .17]	−0.02	[−.24, .20]
Prenatal IPV	−0.28	[−1.10, .54]	−1.27***	[−1.88, −.68]	−1.10***	[−1.89, −.60]
Breastfeeding	−0.04	[−.34, .27]	−0.25*	[−.48, −.02]	−0.30*	[−.54, −.05]
Prenatal IPV × Breastfeeding	0.13	[−.70, .96]	1.06**	[.45, 1.68]	1.10**	[.44, 1.76]
Coefficient of determination (R^2)	R^2 = .04		R^2 = .31		R^2 = .18	

Note: [a]1 = breastfeeding continuation at 6 weeks postpartum, 0 = not breastfeeding at 6 weeks postpartum. IPV, intimate partner violence. $^{x}p < .10$. *$p < .05$. **$p < .01$ ***$p < .001$.

expansion on the nascent literature on breastfeeding and infant temperament (Field et al., 2002; Niegel et al., 2008).

Limitations and future directions

Although the current study provides valuable insight into potential risk and protective factors for high-risk mothers and infants, some limitations should be noted. The longitudinal design of the current study is a strength, but generalizability of the results is limited to the sampling frame (i.e., women receiving low-income prenatal care services). Future work should consider expanded models, including a broader range of maternal socioeconomic status to determine if these effects hold outside of high-risk contexts. The current study also did not include an extensive evaluation of perpetrator characteristics (e.g., whether or not they were the infant's father or whether they were currently living with the participant) or bidirectional IPV. It may be useful for future work to examine how these factors affect intergenerational risk and resilience processes for women and infants. Further, the current study relied on maternal report of IPV exposure, breastfeeding practices, and infant temperament; future research may benefit from utilizing observational measures or structured assessments of children's development and temperament. Such multireporter assessments with larger samples could employ structural equation modeling to better account for model error. Larger sample size would also permit a more comprehensive evaluation of more complex questions regarding the intersection of IPV and other factors that may affect breastfeeding duration (e.g., partner support, injury, and psychiatric medication use) than was possible here. Future work would also benefit from the inclusion of assessments of parenting and attachment to examine how breastfeeding interacts with and contributes uniquely to risk and resilience processes in early infancy.

Clinical and public health implications

Despite these limitations, the current study makes a meaningful contribution to the understanding of risk and resilience factors for high-risk women and infants and has important public health implications. Given the transmission of risk between mothers and children during the perinatal period, particular attention should be paid to IPV exposure during pregnancy. Prenatal screenings for IPV exposure may help inform care for mothers during pregnancy because women experiencing IPV during pregnancy may need additional care and attention, particularly regarding prenatal mental health and breastfeeding supports. Previous work has shown prenatal breastfeeding education is highly influential in women's decisions to initiate and sustain breastfeeding (Miller-Graff, Ahmed, & Paulson, 2018). As such, it suggests early screening for prenatal IPV, paired with education and support resources related to breastfeeding, stands to improve the likelihood that at-risk mothers and infants experience the positive health benefits of breastfeeding. The current findings suggest continued breastfeeding actually stands to substantially reduce IPV's intergenerational conferral of risk on infant adjustment, so policy and practice may contribute to this protection by supporting breastfeeding over time.

The protective role of breastfeeding is a particularly promising area of intervention given that breastfeeding education and support is already embedded in numerous health systems women might engage with during their pregnancy. During pregnancy, many women regularly interact with prenatal care providers, learn about breastfeeding options, and have opportunities to understand and develop practices to protect infants' health and well-being. Consequently, costs of this preventative measure are relatively inconsequential, compared to either more intensive parenting interventions in pregnancy or postpartum mental health supports for women and children. Interventions during preexisting pregnancy health care may be more easily implemented and effective to protect infants from intergenerational risks associated with IPV.

It is important to recognize, however, IPV-exposed women may require more tailored breastfeeding support attending to their particular concerns and difficulties in breastfeeding. Studies of sexual abuse survivors, for example, have found most intend to breastfed and do initiate (in some studies at even higher rates than their nonabused counterparts; Prentice, Lue, Lange, &

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Haflon, 2002), but many were dissatisfied with the emotional attentiveness of available medical supports (Elfgen, Hagenbuch, Gőrres, Block, & Leeners, 2017). Given partner responsiveness also predicts longer breastfeeding duration (Rempel, Rempel, & Moore, 2018), women with a recent history of IPV exposure may benefit from breastfeeding education encouraging them to identify and facilitate other relational supports to promote breastfeeding success. As such, perinatal screenings for IPV may be crucial for enhancing preventative care for women and their infants from the intergenerational transmission of risk; such screenings have been recommended and are covered by the Affordable Care Act (Department of Health and Human Services, 2013), and while this is an important step forward, there is little guidance available for medical service providers to guide the successful implementation of such screenings. It is critical, however, that such screenings be more regularly implemented as the costs of preventative measures are relatively inconsequential, compared to either more intensive parenting interventions in pregnancy or postpartum mental health supports for women and children.

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