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Intergenerational Consequences: Women's Experiences of Discrimination in Pregnancy Predict Infant Social-Emotional Development at Six Months and One Year

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Abstract

Objective—Racial/ethnic and socioeconomic disparities in infant development in the U.S. have lifelong consequences. Discrimination predicts poorer health and academic outcomes. This study explored for the first time intergenerational consequences of women's experiences of discrimination reported during pregnancy for their infants' social-emotional development in the first year of life.

Method—Data come from a longitudinal study with predominantly Black and Latina, socioeconomically disadvantaged, urban young women ($N = 704$, $M_{\text{age}} = 18.53$) across pregnancy through one year postpartum. Women were recruited from community hospitals and health centers in a Northeastern U.S. city. Linear regression analyses examined whether women's experiences of everyday discrimination reported during pregnancy predicted social-emotional development outcomes among their infants at six months and one year of age, controlling for potentially confounding medical and sociodemographic factors. Path analyses tested if pregnancy distress, anxiety, or depressive symptoms mediated significant associations.

Results—Everyday discrimination reported during pregnancy prospectively predicted greater inhibition/separation problems and greater negative emotionality, but did not predict attention skills or positive emotionality, at six months and one year. Depressive symptoms mediated the

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association of discrimination with negative emotionality at six months, and pregnancy distress, anxiety, and depressive symptoms mediated the association of discrimination with negative emotionality at one year.

Conclusion—Findings support that there are intergenerational consequences of discrimination, extending past findings to infant social-emotional development outcomes in the first year of life. It may be important to address discrimination before and during pregnancy and enhance support to mothers and infants exposed to discrimination to promote health equity across the lifespan.

Keywords

discrimination; disparities; infant development; intergenerational; lifespan; pregnancy; social-emotional development

Racial/ethnic and socioeconomic disparities in infant and child development and well-being are well documented in the U.S. Black and Latino infants, as well as infants from lower socioeconomic backgrounds, have poorer behavioral, cognitive, and health outcomes than White infants and infants from higher socioeconomic backgrounds in the first year of life, and these disparities grow larger over time.^{1,2} When they begin kindergarten, Black and Latino children as well as children from lower socioeconomic backgrounds have poorer school readiness, including cognitive and social-emotional development outcomes, than White children and children from higher socioeconomic backgrounds.^{3,4} Infant development outcomes in the first year are critically important because they predict a range of well-being, development, and achievement outcomes later in life.^{5,6} Identifying factors that contribute to infant development disparities can inform strategies to reduce these disparities to promote equity among all infants, children, and youth – an important national goal.⁷ Thus, in the current investigation, we aimed to test the role of pregnant women's discrimination experiences in their infants' social-emotional development across the first year of life among a sample of young, predominantly Black and Latina, socioeconomically disadvantaged women. Focusing on a sample at elevated risk for adverse infant development outcomes can help to identify if discrimination predicts individual differences in those outcomes, thereby identifying a factor that may also help to explain disparities.

The Role of Discrimination

Much research documents adverse mental and physical health consequences of experiencing discrimination, which helps to explain persistent health disparities.⁸ This includes work with children and adolescents finding that experiences of discrimination predict poorer mental and physical health as well as academic outcomes and social adjustment.^{9–11} Discrimination may also be an important factor contributing to disparities in infant development.

Research has mostly focused on the direct consequences for the individual who experiences the discrimination; however, theory and research suggest that there are intergenerational effects of discrimination.^{12,13} For example, a growing body of research demonstrates negative consequences of pregnant women's discrimination experiences, including poorer mental health,¹⁴ greater sexual risk,¹⁵ and excessive weight gain¹⁶ during pregnancy, as well as increased risk of adverse birth outcomes, including preterm birth and low birthweight.

^{13,17} To date, few studies have explored intergenerational consequences of discrimination beyond birth outcomes. Studies with Asian, Black, or Latino American adolescents and their parents/caregivers have found that parents'/caregivers' experiences of discrimination predict poorer well-being among adolescents, such as greater distress and internalizing symptoms, as well as lower self-esteem.^{18–20} One study found that Latina mothers' reports of language-based discrimination were associated with more sick doctor visits for their babies within the first 14 months of life.¹² Another study found that among Mexican-origin families, cumulative discrimination experienced by adolescent mothers/mother figures from pregnancy through 24 months postpartum predicted poorer social-emotional development and academic achievement in children at 5 years.²¹ A daily diary study with Mexican immigrant parents of 3 to 5 year old children also found that on days that parents experienced greater discrimination at the workplace, they reported more externalizing and internalizing behaviors as well as less positive behaviors in their children.²² These findings support that there are intergenerational consequences of discrimination beyond birth outcomes. However, more research on these consequences, particularly for infant development outcomes, is needed, which we aimed to address.

Mechanisms explaining intergenerational consequences of discrimination also deserve greater attention, as understanding mechanisms can identify ways to intervene. Maternal distress (e.g., pregnancy distress, anxiety, depression) adversely affects birth outcomes and infant development,^{23,24} and discrimination is a stressor that causes psychological distress in addition to physical harm.⁸ For example, depressive symptoms have been found to mediate the association of pregnant women's discrimination experiences with lower birthweight.¹⁷ Discrimination has also been found to predict maternal depressive symptoms, which in turn predicted poorer child social-emotional behaviors.²¹ Thus, we aimed to test multiple forms of maternal distress, including pregnancy distress, anxiety symptoms, and depressive symptoms, as possible mechanisms linking discrimination to infant social-emotional development.

The Current Investigation

We aimed to build on and extend the reviewed research by prospectively exploring connections between women's discrimination experiences reported during pregnancy and their infants' social-emotional development at six months and one year of age. Further, we aimed to test possible mechanisms explaining those connections. Participants included predominantly Black and Latina, socioeconomically disadvantaged, urban young women and their infants, therefore focusing on a population at risk for poorer infant development outcomes. We aimed to explore consequences of mothers' discrimination experiences for different aspects of their infants' social-emotional development; therefore, we included multiple subscales of the Infant-Toddler Social Emotional Assessment (ITSEA)²⁵: inhibition/separation problems, attention skills, negative emotionality, and positive emotionality. We also tested several possible psychological mediators of these associations, including pregnancy distress, anxiety symptoms, and depressive symptoms during pregnancy.

Method

The current investigation utilized data from a cluster randomized controlled trial of group prenatal care conducted at 14 community hospitals and health centers in a Northeastern U.S. city (BLINDED). Study sites were randomized to group prenatal care or standard individual care with delayed intervention. At delayed intervention sites, group prenatal care was started and offered to women receiving prenatal care after the conclusion of the study. For the current investigation, which is not a test of the intervention, we controlled for whether participants were recruited from intervention or control/delayed intervention sites.

Procedure

Young women aged 14 to 21 years receiving prenatal care at study sites were referred by health care providers or recruited by study staff. Inclusion criteria included being less than 24 weeks gestation, not having a high-risk pregnancy, and speaking English or Spanish. Four surveys were administered with Audio-Handheld Assisted Personal Interview (A-HAPI) technology across pregnancy and postpartum, including the baseline survey during second trimester, the second time point during third trimester, the third approximately six months postpartum, and the last approximately twelve months postpartum. A-HAPI allowed participants to view questions displayed on handheld computers and listen through headphones to questions via pre-recorded audio files in English and Spanish. Study personnel oriented participants to the technology and remained available for questions, technical issues, or to conduct surveys for participants with low/no literacy. Participants received \$20 for each completed interview. Study procedures were approved by institutional review boards at (BLINDED), and each clinical study site.

Participants

A total of 1233 women participated in the study. Of those, 706 completed the third timepoint (six months postpartum), and 836 completed the final time point (one year postpartum). However, some participants were missing data on one or more variables included in multivariate analyses, resulting in a final analytic sample of 704 participants for the final one year postpartum time point, and 589 participants for the six month postpartum time point, who had data on all variables included in multivariate analyses. Based on t-test and chi-square analyses, those in the analytic sample were younger [$t(1224) = -2.45, p = .014$; analytic sample $M_{age} = 18.53, SD = 1.78$; excluded $M_{age} = 18.78, SD = 1.64$], more likely to report any substance use during pregnancy [$X^2(1) = 4.37, p = .037$; analytic sample 16.3%, $n = 115$; excluded 12.1%, $n = 64$], and more likely to be nulliparous [$X^2(1) = 4.37, p = .037$; analytic sample 86.5%, $n = 609$; excluded 81.9%, $n = 397$] than those missing data. Otherwise, there were no differences on any main study variables or characteristics reported at baseline between participants in the analytic sample and those excluded.

At baseline, average age of the analytic sample ($N = 704$; $n = 334, 47.4\%$ at control sites; $n = 370, 52.6\%$ at intervention sites) was 18.53 years ($SD = 1.78$), and average grade completed was 11th ($M = 10.83, SD = 2.23$). About half of participants (53.4%) identified as Latina, one-third (34.7%) as Black, and the rest as White, Multiracial/ethnic, or Other. Most participants were born in the U.S. (65.3%) and were having their first pregnancy (86.5%). At

baseline, most participants were not employed (77.8%), did not report food insecurity (56.7%), and reported being in a relationship (78.3%). Most participants did not report any substance use across pregnancy (83.7%). Preterm delivery or low birth weight occurred for 13.2%, and 18.2% of participants' babies had a Neonatal Intensive Care Unit (NICU) stay.

Measures

Participant characteristics—Participants reported sociodemographic characteristics, including age, race/ethnicity, nativity, education, employment, food insecurity, relationship status, and parity during the baseline survey. At both pregnancy time points, participants reported if they had used any substances (i.e., cigarettes, alcohol, marijuana, hard drugs) since they were pregnant. Gestational age, birth weight, and NICU stay were abstracted from medical records.

Everyday discrimination—Participants completed the 10-item version²⁶ of the Everyday Discrimination scale,²⁷ which is a well-established measure of day-to-day discrimination experiences due to any reason, at all time points. Participants responded to items such as “In your day-to-day life, how often are you treated with less respect than other people?” on a 1 (*never*) to 4 (*often*) scale. For the current investigation focused on women's discrimination experiences reported during pregnancy, a mean score across the baseline and second time points was created, with higher scores indicating more frequent discrimination experiences ($\alpha = .85$ baseline, $.86$ Time 2).

Infant social-emotional development—Participants completed 21 items from the Infant-Toddler Social Emotional Assessment (ITSEA),²⁵ which is a valid, reliable measure of infant social-emotional development, at both postpartum time points. These items comprise four of the ITSEA's subscales: inhibition/separation problems (8 items, e.g., “My baby cries or hangs onto me when I try to leave”); attention skills (5 items, e.g., “My baby plays with toys for 5 minutes or more”); negative emotionality (5 items, e.g., “My baby often gets very upset”); and positive emotionality (3 items, e.g., “My baby smiles a lot”). Participants responded to items on a 0 (*not at all true*) to 2 (*very true*) scale. Sum scores for each subscale were created for each time point, with higher scores indicating greater inhibition/separation problems ($\alpha = .78$ Time 3, $.76$ Time 4), attention skills ($\alpha = .70$ both time points), negative emotionality ($\alpha = .79$ Time 3, $.81$ Time 4), or positive emotionality ($\alpha = .72$ Time 3, $.75$ Time 4).

Pregnancy distress, anxiety symptoms, and depressive symptoms—Across both pregnancy time points, participants completed the 17-item Revised Prenatal Distress Questionnaire (PDQ),²⁸ the 7-item Generalized Anxiety Disorder-7 (GAD-7),²⁹ and the 15-item version of the Center for Epidemiologic Studies Depression Scale (CES-D),³⁰ which drops somatic items because of confounding with physical symptoms of pregnancy.³¹ For the PDQ, participants reported how bothered, worried, or upset they were about issues specific to pregnancy such as “whether you might have an unhealthy baby” on a 0 (*not at all*) to 2 (*very much*) scale. Scores were summed, and a mean score across both time points was created, with higher scores indicating greater pregnancy distress ($\alpha = .86$ Time 1, $.85$ Time 2). For the GAD-7, participants reported how often in the last two weeks they experienced

symptoms such as “having trouble relaxing” on a 0 (*not at all*) to 3 (*nearly every day*) scale. Scores were summed, and a mean score across both time points was created, with higher scores indicating greater anxiety symptoms ($\alpha = .86$ Time 1, $.89$ Time 2). For the CES-D, participants reported how often in the last week they experienced symptoms such as “feel sad” on a 0 (*less than one day*) to 3 (*5-7 days*) scale. Scores were summed, and a mean score across both time points was created, with higher scores indicating greater depressive symptoms ($\alpha = .86$ both time points).

Analytic Approach

First, descriptive statistics and bivariate correlations were calculated for the analytic sample. Next, we sought to ensure that any associations found between discrimination and infant outcomes were not confounded by study condition, medical factors, or sociodemographic factors known to affect infant development. Therefore, multivariate analyses were conducted that controlled for study condition (dummy-coded for intervention), substance use during pregnancy (dummy-coded for any use), mothers' age (continuous in years), race/ethnicity (two dummy-coded variables for Black and Latina), nativity (dummy-coded as born outside of U.S.), education level (continuous in years), employment status (dummy-coded for employed), food insecurity (dummy-coded), relationship status (dummy-coded as in relationship), and parity (dummy-coded as nulliparous), as well as whether the infant was born preterm or low birth weight (dummy-coded), and if the infant had any stay in the NICU (dummy-coded). More specifically, four linear regression analyses for each time point (eight total) were run in SAS 9.3, one for each of the four outcomes (inhibition/separation problems, attention skills, positive emotionality, negative emotionality). These analyses accounted for site clustering and included all control variables mentioned above in addition to everyday discrimination reported during pregnancy as simultaneous predictors.

Next, several auxiliary analyses were conducted. We conducted the same eight linear regression analyses excluding participants who did not identify as Black or Latina to test if findings were the same only among Black and Latina participants. We also conducted the same regression analyses accounting for site clustering and controlling for study condition but without any other controls included, to test whether findings would be the same without controls and including all participants who completed the ITSEA at the six months and one year postpartum interviews. Finally, we conducted path analyses using MPlus to test possible mediators explaining significant direct associations of discrimination with infant outcomes. These analyses included the same control variables as mentioned above, discrimination as the predictor variable, and pregnancy distress, anxiety symptoms, and depressive symptoms as simultaneous mediators; and, they accounted for correlations between the mediators.

Results

Means, standard deviations, and bivariate correlations among study variables for the analytic sample are in Table 1. Average frequency of everyday discrimination was low ($M = 1.42$, $SD = 0.41$ on 1 to 4 scale). Average report of infant negative emotionality was low ($M = 2.10$, $SD = 2.30$ six months; $M = 2.66$, $SD = 2.44$ one year on 0 to 10 scale), while average report

of infant inhibition/separation problems was low at six months but moderate at one year ($M = 4.88$, $SD = 3.67$ six months; $M = 6.56$, $SD = 3.58$ one year on 0 to 16 scale). Average report of attention skills was moderate ($M = 7.16$, $SD = 2.26$ six months; $M = 6.79$, $SD = 2.30$ one year on 0 to 10 scale), and average report of infant positive emotionality was high ($M = 5.50$, $SD = 0.97$ six months; $M = 5.48$, $SD = 1.04$ one year on 0 to 6 scale). Everyday discrimination reported during pregnancy was positively correlated with inhibition/separation problems ($r = .19$, $p < .001$ six months; $r = .17$, $p < .001$ one year) and with negative emotionality ($r = .20$, $p < .001$ six months; $r = .18$, $p < .001$) at six months and one year, but was not correlated with attention skills or positive emotionality at six months or one year.

Consistent with bivariate correlations, in regression analyses (see full models in Tables 2 and 3) with all controls included, everyday discrimination reported during pregnancy predicted greater inhibition/separation problems ($B = 1.64$, $SE = 0.31$, $p < .001$ six months; $B = 1.42$, $SE = 0.25$, $p < .001$ one year) and greater negative emotionality ($B = 1.03$, $SE = 0.29$, $p = .003$ six months; $B = 0.90$, $SE = 0.23$, $p = .002$ one year) at both time points, but did not predict attention skills or positive emotionality at either time point.

Auxiliary Analyses

In regression analyses excluding participants who did not identify as Black or Latina, findings were unchanged, with everyday discrimination reported during pregnancy predicting greater inhibition/separation problems ($B = 2.05$, $SE = 0.39$, $p < .001$ six months; $B = 1.79$, $SE = 0.32$, $p < .001$ one year) and greater negative emotionality ($B = 1.08$, $SE = 0.29$, $p = .003$ six months; $B = 0.88$, $SE = 0.25$, $p = .004$ one year) at both time points, but not predicting attention skills or positive emotionality at either time point. In regression analyses accounting for site clustering and controlling for intervention condition but not including any other control variables, and with all participants who completed the ITSEA at the six months postpartum ($N = 701$) and one year postpartum ($N = 824$) time points, findings were unchanged, with everyday discrimination reported during pregnancy predicting greater inhibition/separation problems ($B = 1.84$, $SE = 0.25$, $p < .001$ six months; $B = 1.39$, $SE = 0.22$, $p < .001$ one year) and greater negative emotionality ($B = 1.26$, $SE = 0.21$, $p < .001$ six months; $B = 1.09$, $SE = 0.16$, $p < .001$ one year) at both time points, but not predicting attention skills or positive emotionality at either time point.

Finally, path analyses tested pregnancy distress, anxiety symptoms, and depressive symptoms as simultaneous mediators of the significant associations of everyday discrimination with inhibition/separation problems and negative emotionality at six months and one year. None of these variables mediated associations of everyday discrimination with inhibition/separation problems at either time point ($ps > .05$ for all indirect effects). Only greater depressive symptoms mediated the positive association of everyday discrimination with negative emotionality at six months (indirect effect: $B = 0.32$, $SE = 0.13$, $p = .01$). Greater pregnancy distress (indirect effect: $B = 0.17$, $SE = 0.08$, $p = .03$), anxiety symptoms (indirect effect: $B = 0.34$, $SE = 0.16$, $p = .04$), and depressive symptoms (indirect effect: $B = 0.34$, $SE = 0.16$, $p = .03$) all mediated the association of everyday discrimination with negative emotionality at one year.

Discussion

Among a sample of predominantly Black and Latina, socioeconomically disadvantaged, young urban women and their infants, we found that women's reports of everyday discrimination during pregnancy prospectively predicted greater inhibition/separation problems and negative emotionality in their six-month and one-year old infants, while controlling for intervention condition, age, race/ethnicity, nativity, education level, employment status, food insecurity, relationship status, parity, infant preterm or low birth weight, and any NICU stay. Moreover, mediation analyses suggested that maternal distress, including pregnancy distress, anxiety symptoms, and depressive symptoms, help to explain associations of everyday discrimination with negative emotionality, but not with inhibition/separation problems. Discrimination did not predict attention skills or positive emotionality. Results support theory and a small but growing body of research suggesting that there are intergenerational consequences of discrimination,^{12,13,18–21} and they extend past work in this area to prospectively connect mothers' experiences of discrimination reported during pregnancy with their infants' social-development outcomes at six months and one year.

Clinical and Societal Implications

Findings suggest that clinicians who interact with pregnant women and their infants, such as obstetricians and pediatricians, should be aware of the impact that women's discrimination experiences have on their own and their infants' well-being. For example, screening pregnant women for exposure to discrimination and maternal distress might help to identify women to target for interventions. Interventions that target pregnant women and mothers who face discrimination in their day-to-day lives to help them to understand and cope with those experiences and reduce the distress that results from them may be beneficial for both women and their infants. Also, interventions aiming to promote positive social-emotional development in infants may be particularly important to support families facing discrimination.

This study also directly supports recent calls for developmental science to focus more on promoting social justice and equity.³² The current findings support past research demonstrating wide-ranging adverse consequences of discrimination,⁸ suggesting the need to continue efforts to reduce societal stigma and discrimination. Indeed, the current study findings suggest that discrimination occurring even before infants are born can harm their developmental trajectories. Efforts at institutional, interpersonal, and individual levels aimed at reducing discrimination are therefore critical to reducing a wide range of disparities, including to promote the well-being of all infants, children, and youth, and to give them a fair chance in life.

Limitations and Future Directions for Research

Although the everyday discrimination measure used is well-established and captures discrimination due to any reason, limitations of this measure include that it does not differentiate between lifetime or childhood versus current experiences of discrimination,¹³ does not capture second-hand experiences of discrimination (e.g., experiences of family, friends, community members), and does not capture intersectional or unique forms of

discrimination that may particularly affect socioeconomically disadvantaged Black and Latina women and their infants,^{8,33} all of which future research should explore. While the ITSEA is a well-established and validated measure of infant social-development, it is a self-report measure, and future research should replicate findings with clinically administered infant assessments. Some past research exploring connections between parents' discrimination experiences and child outcomes also shares this limitation of using parents' self-report of child outcomes,^{12,21,22} although other research has instead used clinical assessments or child reports^{18–20}; the use of objective child outcome measures is important for future research in this area. Further, although importantly focusing on a sample at increased risk for adverse infant outcomes, this study was limited by the sample being young as well as predominantly socioeconomically disadvantaged and Black and/or Latina. Future research should test the generalizability of findings to different populations, including women of different ages and of different racial/ethnic and socioeconomic backgrounds. In particular, in order to test whether discrimination accounts for socioeconomic and racial/ethnic disparities in infant outcomes, more diverse samples are needed to make group comparisons, which was not possible in the current sample. Given this limitation, these findings along with past research suggest that discrimination may play a role in existing infant disparities, but future work is needed to directly test this.

Mediation findings were consistent with past work suggesting that maternal distress, including pregnancy distress, anxiety symptoms, and depressive symptoms, help to explain links of mothers' discrimination experiences with birth, infant, and child outcomes.^{17,21} However, we found evidence of mediation only for negative emotionality, not for inhibition/separation problems, and findings were distinct for the six month and one year time points. Further, it is unknown why mothers' discrimination experiences predicted the "negative" outcomes assessed (inhibition/separation problems, negative emotionality), but not the "positive" outcomes assessed (attention skills, positive emotionality). These results are consistent with past research finding that discrimination experiences are associated with "negative" outcomes, such as greater anxiety and depressive symptoms, as well as greater anger and hostility, among adults and adolescents.²⁰ These psychological consequences of discrimination among mothers may be transmitted to their infants through biological mechanisms during pregnancy and/or through social and behavioral mechanisms postpartum. Research also suggests that parents' discrimination experiences are associated with poorer parent-child relationships, which can affect development.³⁴ More research on mechanisms explaining these associations is needed to explain these differential associations based on type of outcome and to identify intervention strategies. The current findings also generally suggest that future research should continue to explore intergenerational effects of discrimination, including for other infant and child development and well-being outcomes.

Conclusion

Among a sample of predominantly Black and Latina, socioeconomically disadvantaged, young urban women and their infants, we found that women's discrimination experiences reported during pregnancy prospectively predicted greater inhibition/separation problems and negative emotionality in their six-month and one-year old infants. Given that disparities in infant development have lifelong consequences,^{5,6} these findings suggest it is important to

address discrimination during pregnancy, as well as maternal distress resulting from discrimination, and to support families exposed to discrimination to promote positive outcomes and equity across the lifespan.

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Table 1

Means, and Standard Deviations

	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
—																								
***	—																							
***	-.01	—																						
4	.33**	-.04	—																					
***	.01	.18***	.03	—																				
5	.41**	-.03	.11**	.06	—																			
***	-.10*	.49***	-.01	.29***	-.08*	—																		
04	.18**	-.12***	.36***	-.05	.23***	-.06	—																	
***	.00	.20***	.04	.17**	-.00	.18**	-.04	—																
1	.03	.05	-.01	-.02	.03	-.02	.00	.01	—															
4	-.01	-.02	-.02	.02	-.01	-.02	.02	.07	-.02	—														
2	-.02	.07	.06	-.01	.01	.03	.07	.14**	.05	-.01	—													
00	-.01	.07	-.02	.01	-.04	.07	-.04	.24**	.02	.03	.15**	—												
2	.06	-.02	.08	-.02	.01	-.01	.06	.03	.01	-.05	-.00	.03	—											
***	.06	-.16***	.13***	-.04	.05	-.17***	.18***	-.06	-.05	-.04	.05	.05	.19**	—										
01	.02	-.03	.04	-.01	.05	-.06	.04	-.14**	-.05	.02	-.05	-.01	-.03	.13**	—									
08	.02	-.05	.00	-.02	.03	-.08*	.06	-.03	-.02	.03	.03	-.07	.01	.14**	.03	—								
05	.02	-.06	.02	-.10***	.02	-.05	.05	-.06	-.00	-.05	.11**	.09*	.24**	.37**	-.06	-.26***	—							
04	-.06	.00	-.18***	-.10***	.04	-.02	-.12**	-.06	.14**	-.09*	-.05	-.02	-.05	-.17**	-.09*	-.03	.07	—						

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	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
5	.10*	.01	.05	.02	-.02	.01	.06	.09*	-.03	.32**	-.01	.12**	-.05	.06	-.00	.09*	.00	-.09*	—	—	—	—	—	—
5	.13**	-.09*	.15**	.13**	.02	.02	.09*	.04	.03	-.02	.07	.08*	.12**	.23**	-.02	.01	.15**	-.24**	.08*	—	—	—	—	—
9*	-.14**	.04	-.12**	-.13**	-.04	-.05	-.09*	-.12**	-.03	-.05	-.09*	-.13**	-.10**	-.17**	.04	.02	-.15**	.20**	-.13**	-.78**	—	—	—	—
0	-.02	.11*	.10*	.11**	-.03	.19**	.08*	.35**	.00	-.00	.22**	.17**	.08*	.10**	-.05	.14**	.05	-.10*	.02	.08*	-.12**	—	—	—
***	-.04	.11**	.07	.20**	-.05	.25**	.02	.48**	-.01	.01	.15**	.20**	-.00	.06	-.02	.05	.01	-.15**	.02	.12**	-.19**	.57**	—	—
***	-.08	.19**	-.03	.17**	-.06	.26**	-.04	.52**	.05	.07	.13**	.24**	-.06	-.11**	-.15**	-.01	-.08*	-.04	.05	.03	-.06	.47**	.69**	—
8	7.16	2.10	5.50	6.56	6.79	2.66	5.48	1.42	—	—	—	—	—	10.83	—	—	18.53	—	—	—	—	12.76	5.71	11.82
7	2.26	2.30	0.97	3.58	2.30	2.44	1.04	0.41	—	—	—	—	—	2.23	—	—	1.78	—	—	—	—	6.03	4.54	7.54

it; N = 704 for correlations among baseline and Time 4 (1 year postpartum) variables, N = 591 for correlations among baseline and Time 3 (6 months postpartum) between Time 3 and Time 4 variables

Regression Analyses for Four ITSEA Outcomes at Six Months, Accounting for Site Clustering (N = 591)

Table 2

	<u>Inhibition/Separation Problems</u>			<u>Attention Skills</u>			<u>Negative Emotionality</u>			<u>Positive Emotionality</u>		
	<i>Unstandardized Beta (Standard Error)</i>	<i>t</i>		<i>Unstandardized Beta (Standard Error)</i>	<i>t</i>		<i>Unstandardized Beta (Standard Error)</i>	<i>t</i>		<i>Unstandardized Beta (Standard Error)</i>	<i>t</i>	
Discrimination across 2nd and 3rd Trimesters of Pregnancy	1.64 (0.31)	5.36**		-0.01 (0.24)	-0.03		1.03 (0.29)	3.60**		0.10 (0.12)	0.87	
Intervention Condition	0.10 (0.25)	0.41		0.13 (0.18)	0.68		0.25 (0.15)	1.71		0.02 (0.06)	0.35	
Infant Low Birth Weight or Preterm	0.00 (0.33)	0.00		-0.28 (0.20)	-1.44		-0.27 (0.28)	-0.95		-0.12 (0.10)	-1.23	
Any Substance Use across Pregnancy	-0.49 (0.25)	-1.96		-0.16 (0.17)	-0.93		0.27 (0.25)	1.10		0.13 (0.09)	1.46	
Food Insecure Baseline	-0.34 (0.26)	-1.33		-0.10 (0.10)	-0.97		0.08 (0.23)	0.33		-0.10 (0.09)	-1.16	
Employed Baseline	-0.16 (0.28)	-0.58		0.23 (0.21)	1.08		-0.00 (0.21)	-0.01		0.13 (0.12)	1.15	
Education Baseline (Continuous Grade)	-0.25 (0.07)	-3.63**		0.02 (0.05)	0.40		-0.15 (0.04)	-3.82**		0.04 (0.02)	1.89	
In Relationship Baseline	0.29 (0.35)	0.83		0.06 (0.22)	0.26		0.09 (0.24)	0.38		0.05 (0.11)	0.47	
Nulliparous Baseline	-0.52 (0.40)	-1.31		0.01 (0.24)	0.04		-0.09 (0.23)	-0.41		-0.09 (0.11)	-0.79	
Age Baseline (Continuous Years)	0.01 (0.07)	0.11		-0.01 (0.06)	-0.22		-0.01 (0.03)	-0.17		-0.02 (0.03)	-0.70	
Born Outside U.S.	-0.34 (0.16)	-2.09		-0.09 (0.17)	-0.55		-0.18 (0.13)	-1.38		-0.26 (0.10)	-2.63*	
Infant Any Time in NICU	0.30 (0.39)	0.76		0.58 (0.20)	2.95*		0.11 (0.23)	0.48		0.10 (0.05)	1.94	
Race/Ethnicity (Black)	0.23 (0.54)	0.42		0.21 (0.30)	0.70		-0.30 (0.30)	-1.00		0.16 (0.11)	1.46	
Race/Ethnicity (Latina)	-0.51 (0.60)	-0.85		-0.41 (0.33)	-1.26		0.02 (0.40)	0.04		-0.03 (0.15)	-0.20	

* $p < .05$ * $p < .01$;

NICU = Neonatal Intensive Care Unit

Table 3
Regression Analyses for Four ITSEA Outcomes at One Year, Accounting for Site Clustering (N = 704)

	<u>Inhibition/Separation Problems</u>		<u>Attention Skills</u>		<u>Negative Emotionality</u>		<u>Positive Emotionality</u>	
	<i>Unstandardized Beta (Standard Error)</i>	<i>t</i>	<i>Unstandardized Beta (Standard Error)</i>	<i>t</i>	<i>Unstandardized Beta (Standard Error)</i>	<i>t</i>	<i>Unstandardized Beta (Standard Error)</i>	<i>t</i>
Discrimination across 2nd and 3rd Trimesters of Pregnancy	1.42 (0.25)	5.60**	0.09 (0.29)	0.31	0.90 (0.23)	3.84**	-0.11 (0.10)	-1.11
Intervention Condition	-0.12 (0.21)	-0.54	0.12 (0.14)	0.88	-0.17 (0.19)	-0.91	0.04 (0.04)	0.81
Infant Low Birth Weight or Preterm	0.05 (0.43)	0.11	-0.00 (0.25)	-0.02	-0.34 (0.22)	-1.56	0.01 (0.09)	0.11
Any Substance Use across Pregnancy	-0.28 (0.31)	-0.92	0.09 (0.29)	0.33	0.08 (0.20)	0.39	0.20 (0.08)	2.56*
Food Insecure Baseline	-0.26 (0.33)	-0.79	-0.23 (0.18)	-1.30	0.16 (0.20)	0.79	-0.12 (0.08)	-1.58
Employed Baseline	-0.12 (0.30)	-0.41	0.01 (0.20)	0.05	0.10 (0.23)	0.46	0.08 (0.07)	1.19
Education Baseline (Continuous Grade)	-0.04 (0.07)	-0.61	0.05 (0.07)	0.80	-0.19 (0.04)	-4.40**	0.07 (0.02)	3.51**
In Relationship Baseline	0.05 (0.26)	0.20	0.29 (0.17)	1.73	-0.05 (0.20)	-0.26	0.04 (0.10)	0.42
Nulliparous Baseline	-0.47 (0.36)	-1.32	0.13 (0.17)	0.74	-0.35 (0.22)	-1.57	0.06 (0.13)	0.46
Age Baseline (Continuous Years)	-0.20 (0.09)	-2.18*	0.00 (0.05)	0.06	-0.01 (0.06)	-0.24	-0.01 (0.03)	-0.19
Born Outside U.S.	-0.42 (0.31)	-1.35	0.26 (0.18)	1.46	-0.13 (0.32)	-0.40	-0.18 (0.09)	-2.02
Infant Any Time in NICU	-0.06 (0.23)	-0.24	-0.15 (0.24)	-0.63	0.06 (0.21)	0.29	0.12 (0.08)	1.56
Race/Ethnicity (Black)	0.93 (0.36)	2.61*	-0.16 (0.27)	-0.61	-0.02 (0.39)	-0.04	-0.04 (0.10)	-0.35
Race/Ethnicity (Latina)	-0.18 (0.46)	-0.39	-0.36 (0.28)	-1.29	-0.26 (0.36)	-0.71	-0.13 (0.11)	-1.15

* $p < .05$,

* $p < .01$;

NICU = Neonatal Intensive Care Unit