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Paid maternal leave is associated with better language and socioemotional outcomes during toddlerhood

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Abstract

The United States is the only high-income country that does not have a national policy mandating paid leave to working women who give birth. Increased rates of maternal employment post-birth call for greater understanding of the effects of family leave on infant development. This study examined the links between paid leave and toddler language, cognitive, and socioemotional outcomes (24–36 months; $N = 328$). Results indicate that paid leave was associated with better language outcomes, regardless of socioeconomic status. Additionally, paid leave was correlated with fewer infant behavior problems for mothers with lower levels of educational attainment. Expanding access to policies that support families in need, like paid family leave, may aid in reducing socioeconomic disparities in infant development.

1 | INTRODUCTION

In 2018, 61.5% of mothers in married-couple families and 68.8% of single-parent mothers with children under the age of 6 were employed (U.S. Department of Labor & Bureau of Labor Statistics, 2019). Being a mother is a lifetime effort, but the period after childbirth might be particularly critical for both mothers and their children. Mothers often deal with a host of perinatal experiences including post-birth complications, sleep disruption, lasting weight fluctuations, lactation difficulties, severe exhaustion, and postpartum depression (Abou-Dakn et al., 2009; Saxbe et al., 2018; Schulte et al., 2017). Nevertheless, an estimated

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43% of first-time mothers returned to their jobs within one month of childbirth (Laughlin, 2011), and about 23% of women go back to work within two weeks of giving birth (Pozniak et al., 2014). The first few months of life are also a time for infants to develop their foundational cognitive (Burchinal et al., 1996; Davis & Sandman, 2010; Fischer, 1980), linguistic (Bornstein & Tamis-Lemonda, 1997; Friedmann & Rusou, 2015; Weisleder & Fernald, 2013), and socioemotional (Edwards & Hans, 2015; Seifer et al., 1996) skills—most optimally achieved within sensitive and responsive interactions with their caregivers (Calkins, 2011; Morris et al., 2007; Thompson, 1994).

1.1 | Mother-infant interactions post-birth

In the first year of life, infants almost exclusively rely on their parents to co-regulate their arousal, emotion, attention, behavior, and cognition (Calkins, 2011). Calkins (2011) defines self-regulation as the set of biological and behavioral control mechanisms that enable an individual to manage these processes. Without the neurological, psychological, linguistic, and motoric abilities to self-regulate, it is important for newborns and their caregivers to share numerous and repeated experiences, become sensitized to the physiological and behavioral cues from each other, and eventually form a positive and enduring bond. Above providing the basic needs of nutrition, shelter, and cognitive stimulation, these early parent-infant interactions provide the foundation for future positive social interactions and environmental exploration (Feldman, 2003). This foundation is facilitated by dyadic sensitive and responsive practices like gaze, touch, vocalization, and affect (Calkins, 2011) and is found to support children's cognitive and social-emotional development across the first five years of life (Feldman & Eidelman, 2009). For example, in one study, 10-month-old infants altered their babbling to mirror the phonological structure of their mother's verbal language only when mothers responded in a temporally contingent manner (Goldstein & Schwade, 2008). In a similar study, maternal responsive and contingent behaviors were positively associated with infant language outcomes at 21 months (Nicely et al., 1999).

Parent-infant interactions can be adversely affected by caregiver or environmental stress. Stress is typical in the first few months of caregiving, however, in unhealthy amounts, stress can hinder a caregiver's ability to responsively tend to their infant's cues. For example, mothers who report higher levels of stress have been found to exhibit lower levels of sensitivity to infant cues during dyadic interactions (Crnic et al., 1983; Lutz et al., 2012). Similarly, infants of mothers who exhibit higher levels of chronic physiological stress (measured through hair cortisol) have been shown to exhibit alterations in brain function during the first year of life (Troller-Renfree et al., 2020). Given the important contributions of early parental sensitivity on longitudinal child developmental outcomes, these studies point to the necessity of mitigating excess postpartum stress.

1.2 | Maternal employment

Maternal employment does not prohibit responsive and supportive mother-infant relationships. By nature, employment may decrease the quantity of mother-infant time together (Fox et al., 2013), but not necessarily the quality. For example, Hsin and Felfe (2014) found that while full-time working mothers spent less total time with their children (ages 0–12), compared to mothers who were unemployed or worked part-time, full-time

mothers on average spent a greater proportion of time with their children on educational activities like studying and reading, as well as structured activities like organized sports, arts, and music. Moreover, maternal employment may have many indirect benefits for families. Within a sample of low-income mothers, Coley et al. (2007) reported that being employed was associated with decreases in (1) mothers' depressive symptoms, (2) financial strain, and (3) food insecurity—most likely due to increases in income and resources.

Rather than simply examining the impact of maternal employment, it may be that the *timing* of maternal employment plays a larger role in parent-child interactions and subsequent child development. Past studies have reported negative associations between maternal employment and observational measures of development and academic achievement during early childhood, even after controlling for various confounds like socioeconomic status (SES) or childcare (Han et al., 2001; Ruhm, 2004; Waldfogel et al., 2002). Interestingly, these negative associations were specific to maternal employment in the first few months of the infant's life. Maternal employment between 3 and 12 months after childbirth has been linked to higher maternal sensitivity (Brooks-Gunn et al., 2010; Buehler & O'Brien, 2011), fewer depressive symptoms (Buehler & O'Brien, 2011; Mandal, 2018), and higher scores on measures of cognitive stimulation and parent-child interactions within the home (Brooks-Gunn et al., 2010). Furthermore, employment in the second-and third year of the child's life has been reported to be positively associated with early cognitive outcomes (Waldfogel et al., 2002) and socioemotional development (Han et al., 2001), with some studies reporting outsized benefit for families from lower socioeconomic backgrounds (Bullinger, 2019; Byker, 2016; Rossin-Slater et al., 2013). Given these timing effects of maternal employment, it is important to understand how differences in paid versus unpaid leave could impact child developmental outcomes.

1.3 | Maternal leave post-birth

Despite evidence that mothers may benefit from supported time with their infants after giving birth, U.S. federal policies do not adequately assist working moms. The United States is the only OECD (Organization for Economic Cooperation and Development) country without a national policy of paid maternity leave and currently, only eight U.S. states (California, New Jersey, New York, Rhode Island, Massachusetts, Washington, Oregon, and Connecticut), and the District of Columbia have a paid family leave policy at the state level. What is in place currently at the federal level is the Family and Medical Leave Act (FMLA), which guarantees up to 12 weeks of *unpaid* leave to qualifying employees for specified family and medical leave (U.S. Department of Labor, Wage, & Hour Division, 2012). Eligibility requires that employees have worked for the same employer for 12 months, have at least 1250 hours of service during the year preceding the leave, and work at a location where the employer has at least 50 employees within 75 miles of the job's location. Under these guidelines, only half of mothers between the ages of 18 and 34 years old are eligible for this benefit (IMPAQ International, 2017; Klerman et al., 2012). Additionally, unless a company pays for maternity time off or an individual lives in a state that offers wage replacement policies, their leave is likely to be unpaid; consequently, it is less likely to be used as parents are unable to sacrifice their income in order to stay at home with their young infants (Stearns, 2015). Research has shown, however, that offering paid leave

increases the odds of families staying at home with their infants. California's Paid Family Leave Program increased maternal leave claims from 36.4% of new mothers in 2004, when the program started, to 45.5% in 2014 (Rossin-Slater, 2018). This program also doubled the overall length of maternity leave taken, from 3 to 6 weeks, with higher rates within socioeconomically disadvantaged groups (Rossin-Slater et al., 2013).

The availability of paid leave at the state level has already begun to show positive health repercussions. In California, mothers demonstrated significant increases in breastfeeding after the passage of paid leave compared to mothers of similar demographic backgrounds in other states (Huang & Yang, 2015). Using a national sample, researchers found that returning to work within 12 weeks of childbirth was associated with higher maternal depression scores, but mothers who received paid leave on average had lower depression scores (Mandal, 2018). Using the policy change in California as a natural experiment, Bullinger (2019) found improvements in parent-reported child health and maternal mental health, as well as higher ratings in parent's ability to cope with the daily demands of parenting. Overall, protected paid leave may offer a period of time for mothers to recover from the numerous stressors of childbirth and postpartum care, as well as acclimate to the responsibilities of parenthood without risk of financial loss and increased stress.

1.4 | Current study

The literature suggests that both infants and mothers benefit from some paid, job-protected time at home after childbirth, as it may increase the likelihood and length of maternal leave to foster sensitive, reciprocal parent-child interactions in the first year of life (Rossin-Slater, 2018; Rossin-Slater et al., 2013), as well as reduce financial stress that may dampen these experiences (McKelvey et al., 2002). Most of the studies in the United States thus far have examined the effects of family leave on maternal mental well-being or child health. Very little is known about the potential links between paid versus unpaid maternal leave and children's subsequent cognitive development. The current study examines associations among maternal post-birth leave (paid/unpaid) and cognitive, linguistic, and socioemotional outcomes during toddlerhood. We hypothesize that mothers who receive a paid leave post-birth will have toddlers who demonstrate higher cognitive, linguistic, and socioemotional outcomes. To be more specific, we hypothesize that independent of SES, post-birth paid leave will be positively associated with toddler developmental outcomes. Second, these associations will be strongest for families from lower SES households who may face the most stress from an unpaid leave. Finally, longer durations of paid leave in the first year of life will be positively associated with toddler outcomes.

2 | METHODS

2.1 | Participants

The current sample included 328 children (166 males; age M = 30 months, SD = 4.28). Participants were excluded from participating in the present study on the basis of birth before 30 weeks' gestation, multiple births, or NICU admission. At the time of data collection, FMLA was available to all eligible families, but families did not live in states that had paid leave policies in place. The racial breakdown of this sample was as follows:

67% White, 13% Bi-racial, 7% American Indian or Alaskan Native, 5% Asian, 3% Black, and 5% unreported. The present study was conducted according to guidelines laid down in the Declaration of Helsinki, with written informed consent obtained from a parent or guardian for each child before any assessment or data collection. All research procedures were approved by the Columbia University Medical Center and Sanford Health IRBs.

2.2 | Measures

2.2.1 | Family and household characteristics—Mothers were given a questionnaire in which they reported on their socioeconomic status (highest level of education attained, annual household income), employment experiences (working or unemployed), and their infant's age and gestational age at birth. If mothers reported working during pregnancy they were asked: (1) if they took time off after giving birth, (2) if this time off was compensated monetarily in any way, and (3) how long they took off before returning to work. If mothers reported any monetary compensation during their leave, they were categorized as having paid leave.

2.2.2 | Developmental assessments at 24–36 months—To maximize the number of participants, maternal self-report measures were used rather than observer-rated measures, as many families had moved out of the immediate area and were unable to return for a laboratory visit. Assessments were given over the phone by trained research assistants and took 45–60 min to complete.

2.2.3 | The Brief Infant-toddler Social Emotional Assessment (BITSEA)—The BITSEA is a tool to evaluate potential risk for social and emotional developmental problems or delays in social competence among children 12–36 months of age (Briggs-Gowan & Carter, 2008; Briggs-Gowan et al., 2002; Briggs-Gowan, Carter, Irwin, Wachtel, & Cicchetti, 2004; Briggs-Gowan et al., 2013). The assessment contains 42 questions, each requiring one of three responses: true/rarely, somewhat true/sometimes, or very true/often. The assessment yields two scores related to behavior problems (e.g., is restless and cannot sit still, has trouble adjusting to changes) and social competence (e.g., "plays well with other children, points to show you something far away"). Higher scores on the problem scale and lower scores on the social competence scale indicate greater risk. Past studies have reported significant correlations between this parental-report measure of socioemotional ability and experimenter conducted assessment measures like the Infant Mullen Scales of Early Learning and the Vineland Adaptive Behavior Scales for Children (Briggs-Gowan & Carter, 2008). Additionally, the BITSEA has been validated relative to a clinical diagnostic interview (sensitivity: 73%–81%; specificity: 70%–83%) and the commonly used Child Behavior Checklist (CBCL) (sensitivity: 80%–96 %; specificity: 75%–90%) (Briggs-Gowan et al., 2013).

2.2.4 | The Parent Report of Children's Abilities-Revised (PARCA-R)—The PARCA-R is a parent-report assessment for examining potential risk for linguistic and cognitive delays in toddlers (Blaggan et al., 2014) and has been used in large-scale national studies (Johnson et al., 2015; Saudino et al., 1998). PARCA-R has been validated against the Bayley Scales of Infant Development III (BSID III), with Spearman rank-order correlations

between the parent-report PARCA-R measure and BSID III experimenter elicited measure of 0.43 for cognitive sections and 0.71 for language sections (Martin et al., 2013). Sections of the report include nonverbal cognition (34 questions), vocabulary (list of 100 common words), and sentence complexity (12 questions). The vocabulary and sentence complexity scores were summed to create the linguistic score.

2.3 | Analysis plan

Participants were categorized into two groups: (1) mothers who worked during pregnancy and took unpaid leave before returning to work ($n = 117$), and (2) mothers who worked during pregnancy and took some form of paid leave before returning to work ($n = 211$), see Table 1 for demographic information. There were no differences between these two groups in terms of gestational age at birth ($p = .88$), but there were significant differences in income ($p < .01$), maternal education ($p < .01$), and infant age ($p = .01$). In order to account for these differences, gestational age at birth, infant sex, infant age, family income, and maternal education were included as covariates in all subsequent analyses. These variables have been previously found to impact early cognitive, linguistic, and behavioral development (Bradley & Corwyn, 2002; Foster-Cohen et al., 2007; McCarton et al., 1996; Noble et al., 2012, 2015; Prior et al., 1993; Schirmer et al., 2006). Maternal education and family income are often used jointly or independently as proxies for socioeconomic status. In this sample, they were positively correlated ($r = .54$, $p < .001$), but due to their differential associations with children's language, cognitive, and behavioral outcomes (Brito et al., 2017; Richels et al., 2013), both variables were kept as covariates in subsequent analyses.

Families were recruited from two different geographic sites, New York and South Dakota, but there were no differences between the two sites on any of the child developmental outcomes (Cognitive $p = .42$; Linguistic $p = .06$, Socioemotional Problems $p = .10$; Socioemotional Competence $p = .29$). The child outcome measures fell into three categories: socioemotional (BITSEA problem and social competence score), language (PARCA-R linguistic score) and cognitive (PARCA-R cognitive score), see Table 2 for descriptive statistics.

In order to examine the effects of paid versus unpaid leave on child outcomes, multiple linear regressions were conducted for each child outcome measure. In an effort to disentangle SES from experiences of paid leave, we also examined these associations within separate groups of mothers by income levels. To examine if SES (maternal education or family income) moderated links between paid leave and developmental outcomes, separate interaction terms (leave * SES) were added to these models. Finally, to investigate whether the length of maternal leave was associated with child outcomes, the time in weeks that mothers took off after giving birth was included as a predictor variable.

3 | RESULTS

3.1 | Associations between paid leave and developmental outcomes

Examining the effect of paid versus unpaid leave on child outcomes, mothers who had paid leave after childbirth had toddlers with significantly higher linguistic scores than children of

mothers with unpaid leave after birth (β = .15, $p < .01$, adj. $R^2 = .17$; Table 3, Figure 1). Even though income was controlled for within this analysis, it may be that this association is explained by higher family income within the paid leave group. To ensure this was not the case, the sample was divided into two groups based on the median split of income and the same regression was rerun within each income group. Results indicated a significant association between type of leave and linguistic scores for both income groups, indicating that the link between paid leave and higher linguistic scores was still present for the lower income group. There were no significant differences between toddlers whose mothers took paid versus unpaid leave on cognitive or socioemotional scores (p's > .47).

In the next set of analyses, we examine the possible moderating role of SES on the relation between type of leave and toddler developmental outcomes. Results indicated two main effects: (1) toddlers whose mothers had paid leave had significantly lower BITSEA problem scores (β = −.91, $p = .02$, adj. $R^2 = .06$) and (2) higher maternal education was also associated with lower BITSEA problem scores (β = −.21, $p = .03$, adj. $R^2 = .06$, Table 4). But these results were explained by the interaction between these two variables, as the effect of paid versus unpaid family leave on socioemotional scores was dependent on maternal education (β = .98, $p = .02$, adj. $R^2 = .06$). Probing this interaction, a Johnson-Neyman analysis revealed that this association was only significant at the lower end of the maternal education spectrum, see Figure 2. In other words, compared to unpaid leave, paid leave was significantly associated with lower BITSEA problem scores, but this relation was only present for mothers with lower levels of education. There were no significant interactions between type of leave and household income ($p = .60$), and there were no other significant SES interactions for any other child outcome (p's >.05).

3.2 | Potential effects of length of leave on developmental outcomes

There were no significant differences in length of leave between the unpaid ($M = 13.16$ weeks, SD = 9.90, range = 1–48 weeks) and paid leave ($M = 11.65$, SD = 4.66, range = 2–36 weeks) groups ($p = .06$). Length of leave was also not related to maternal education ($p = .68$) or household income ($p = .23$). To examine if the duration of time at home with the infant could explain differences in type of leave and developmental outcomes, both length of paid leave and length of unpaid leave were analyzed separately as predictor variables. For both groups, the length of leave did not have a significant effect on any of the outcome variables (p's > .05), see Figure 3.

4 | DISCUSSION

This is the first U.S. study, to our knowledge, to examine the association between paid leave and early child cognitive, linguistic, and socioemotional outcomes. The sample in the current study was not only diverse in terms of SES, but there was also high variation in terms of who had access to paid and unpaid leave. This unique combination enabled us to examine the effects of paid leave in various socioeconomic contexts. With regards to our first hypothesis, results indicated that mothers who received compensation in some way during their time off after childbirth had toddlers with significantly higher language scores, but we did not find any links between paid leave and cognitive or socioemotional scores

across the whole sample. A potential mechanism for this result may be reduced maternal stress. The birth of a child incurs new expenses for a family and having to take time off from work without pay puts an additional financial strain on an already stressful situation. Prior studies have reported links between higher maternal stress and lower maternal sensitivity and responsiveness (Crnic et al., 1983; Feldman et al., 2004). It may be that, compared to mothers who take paid leave, mothers with unpaid leave experience more financial-related stress, potentially leading to fewer sensitive and responsive interactions with their infants and subsequent differences in toddler language abilities. Future studies should include measures of maternal stress (both physiological and perceived) as a possible mediator between the type of leave and child language outcomes.

It is reasonable to imagine that paid leave would be especially beneficial to mothers living in lower SES households as a lack of income after childbirth would exacerbate their financial stress exponentially more than mothers with financial security. When examining the interactive effect of SES on the link between paid leave and socioemotional outcomes, we find that the association between paid leave and lower BITSEA problem scores was only significant for mothers whose highest level of educational attainment was a high school degree or less. Our results suggest that paid leave may have an outsized benefit to mothers on the lower end of the socioeconomic spectrum, replicating past findings (Bullinger, 2019, Byker, 2016 and Rossin-Slater et al., 2013). While mothers from higher SES households are more likely to have access to paid leave, as our study shows, there are situations in which mothers from lower SES households may also receive some paid time off after giving birth. Mothers could be eligible for some paid leave if they work for a large company, like a university or bank that extends this benefit to all employees. Mothers may also be able to use their accrued vacation or sick days to cover their paid time off. In an effort to disentangle SES effects from associations with paid leave, and to ensure our results were not solely due to selection bias, we re-ran all analyses with only families from lower SES households and still found the same results demonstrating the benefits of paid leave. This further supports the idea that, though mothers from lower SES households may have less access to paid family leave, when they do have it, it is associated with positive language and socioemotional outcomes for their children.

Contrary to previous work, the current analysis did not find a link between length of leave and developmental outcomes during toddlerhood. This was somewhat surprising given the assumption that if time off is beneficial for mothers, we might expect there to be either a positive correlation with the length of time off or an optimal amount of time off. It is possible that too much or too little time off is associated with negative outcomes, indicative of a U-shaped curve, but we could not determine this from our dataset. One explanation may be that in our sample very few mothers took less than 2 weeks or more than 12 weeks off after childbirth (paid or unpaid). Therefore, our sample did not have enough extreme cases to adequately investigate the effects of length of leave.

There are many limitations in this current study. First, aside from basic questions about employment and time off after childbirth, we do not have a full picture of the family's household or employment situation. For example, we do not have information about how mothers had access to paid leave (e.g., whether it was part of company policy, if they used

vacation days, how much it covered), or whether a second caregiver received paid leave. A more comprehensive questionnaire or qualitative interview should be used in the future to address these nuances. Second, while the BITSEA and PARCA-R surveys are widely used, it is a limitation that our study does not include any experimenter administered assessments. Although past studies have reported on the validity of the specific parent-report assessments used within this study in relation to laboratory-based measures (Johnson et al., 2008; Martin et al., 2013), it is possible that parent's *perceptions* of their child's skills and abilities could also be impacted by environments of stress, directly or indirectly related to post-birth experiences. The current preliminary findings would benefit from replication with other measures of cognitive development like experimenter elicited behavioral assessments and neurophysiological measurements. Additionally, while we speculated that maternal stress may be a mechanism that explains these differences, future studies should include measures of maternal stress (both physiological and perceived) and parent-child interactions to include as possible mediators between the type of leave and child outcomes.

There are many pathways through which early life stress and adversity can lead to differences in neurocognitive outcomes for young children (Brito & Noble, 2014). In addition to adequate prenatal care and household resources, sufficient quality time between mother and infant, as well as time to adjust to the newfound stressors of parenthood, may be crucial to the mental health of the mother and subsequent development of the child. Public policies like mandated paid family leave would support *all* families during this sensitive period of infant development, but its positive effects could specifically target and benefit the most under-resourced families—possibly alleviating disparities in infant outcomes.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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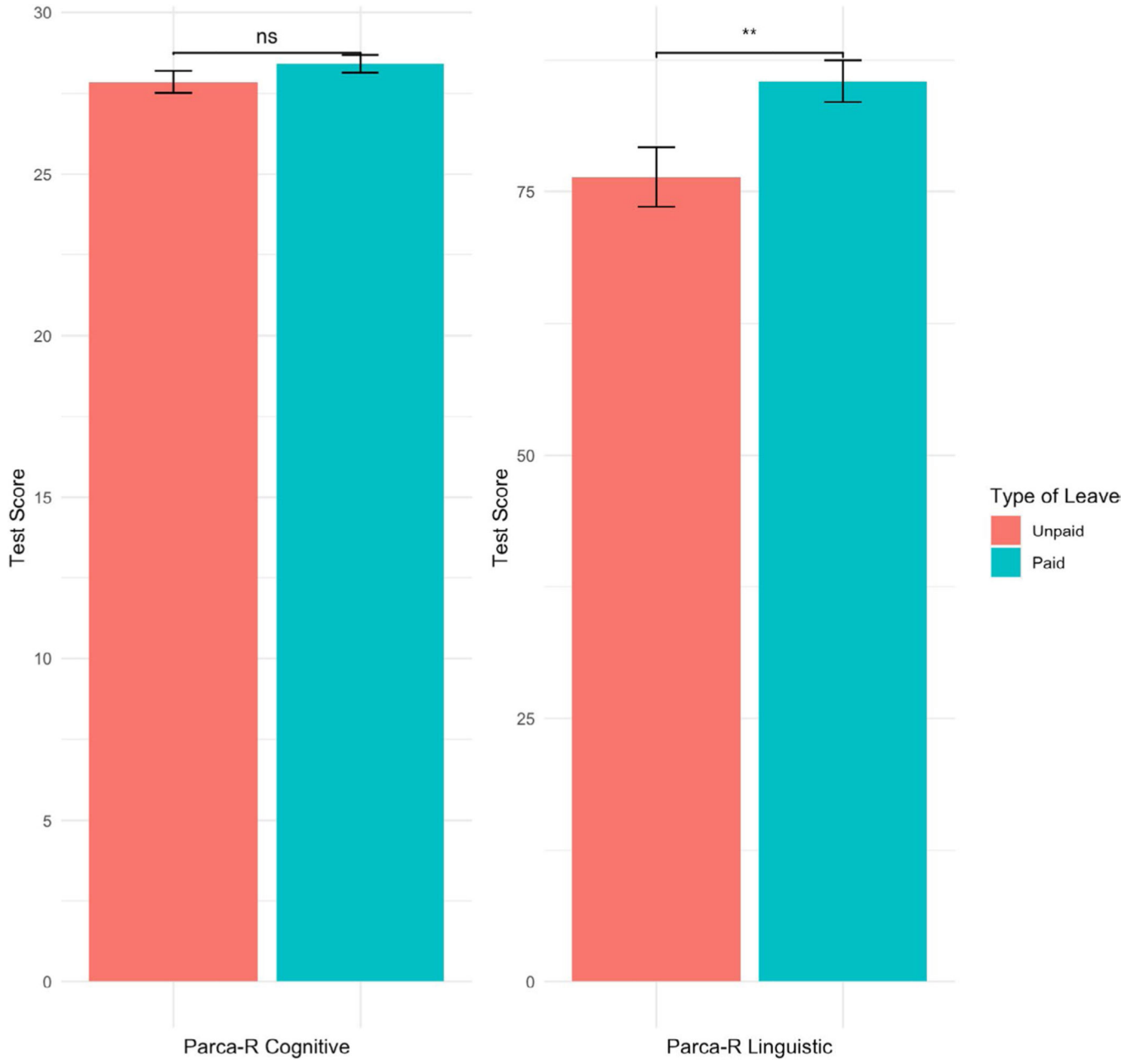

FIGURE 1.

Significant differences in paid versus unpaid leave found PARCA-R linguistic but not cognitive scores (**$p < .01$)

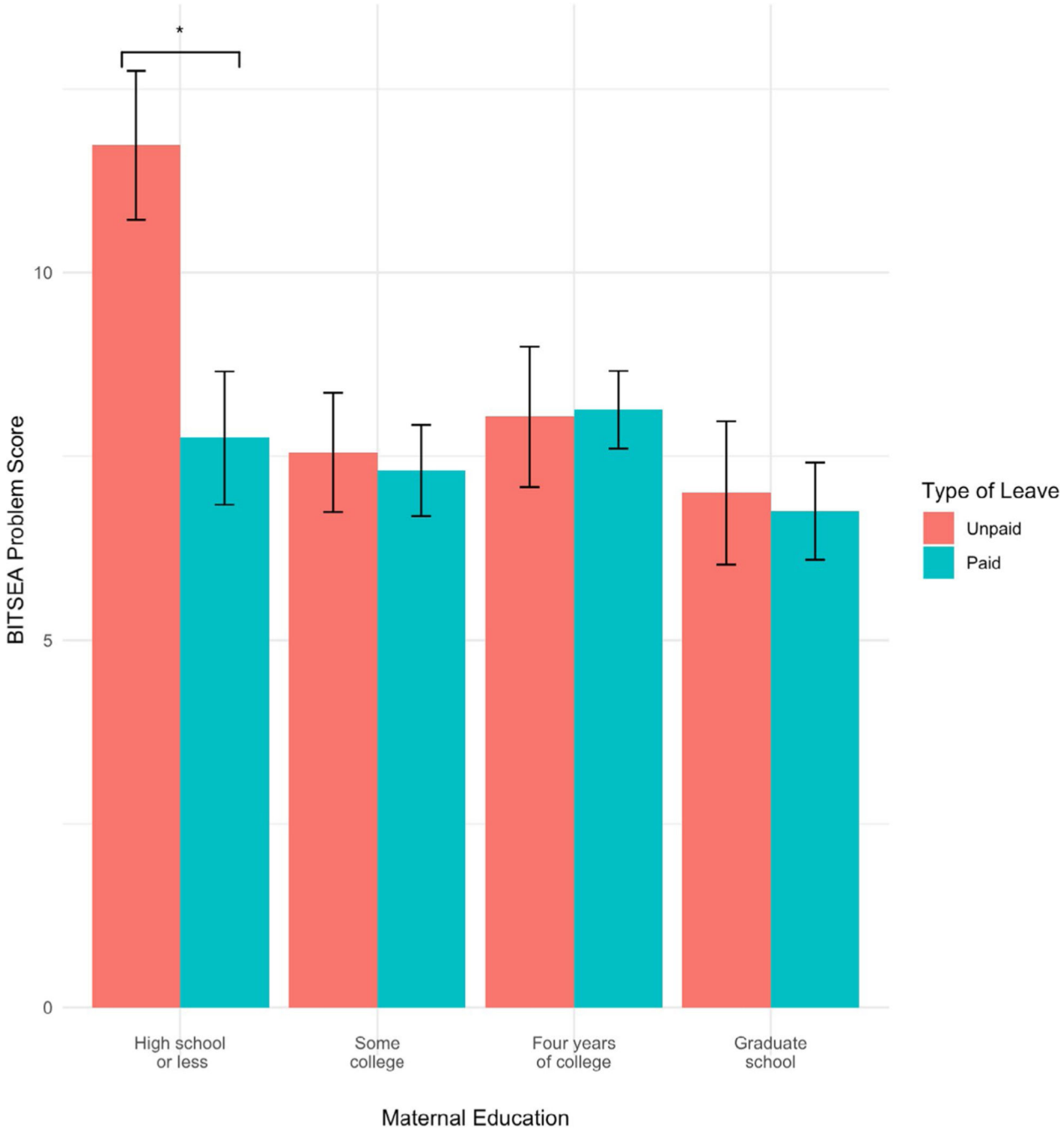

FIGURE 2.

Johnson-Neyman analysis suggests that paid leave is significantly related to lower BITSEA problem scores, but only for mothers with lower levels of education. Variables are categorized here for visualization purposes only

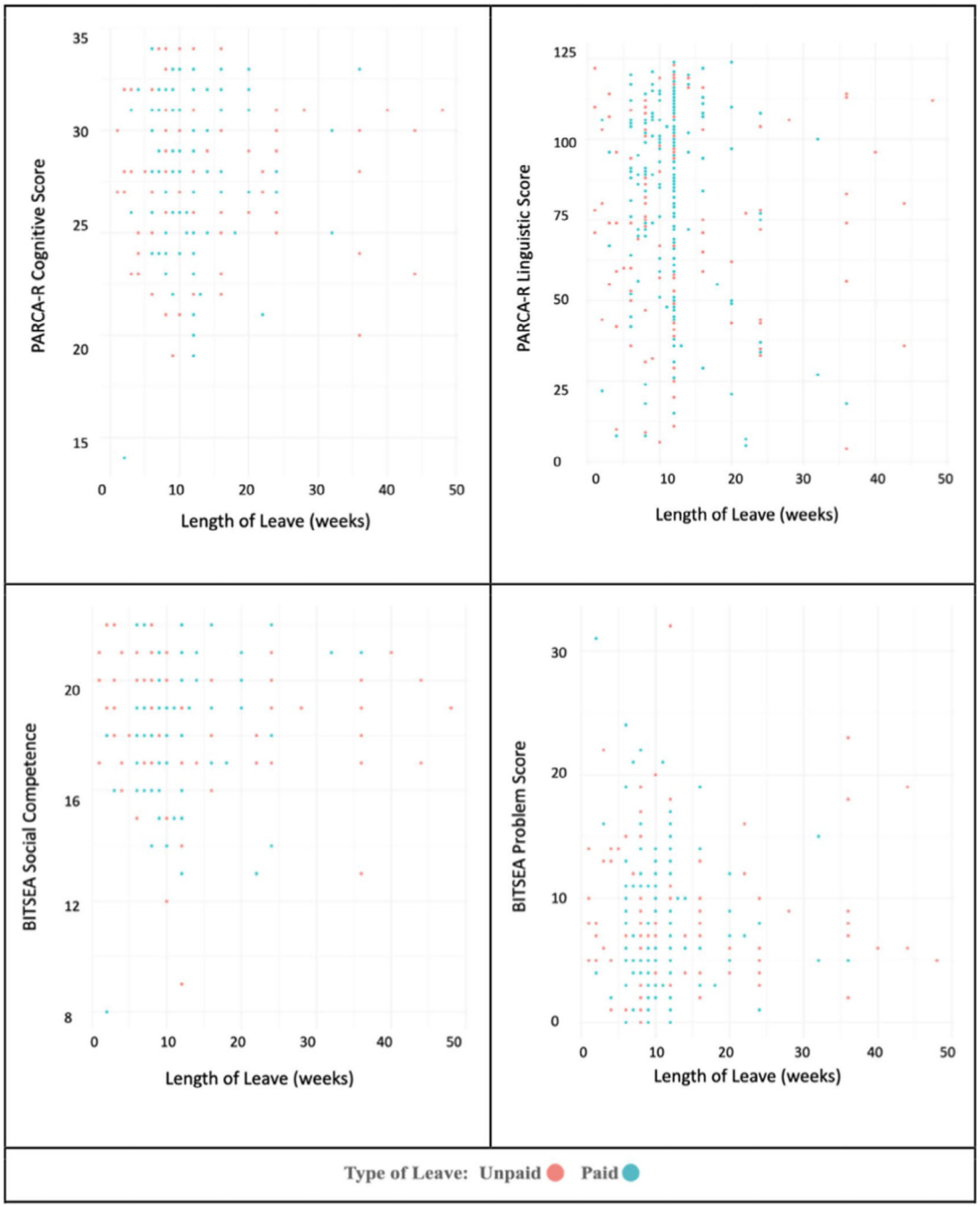

FIGURE 3.

There were no associations between the length of maternity leave and toddler developmental outcomes

TABLE 1

Demographics

Type of leave		**Mean**	**SD**
Mothers with unpaid leave (*n* = 117, male infant = 66)	Gestational age at birth (weeks)	38.96	1.7
	Infant age (months)	30.55	4.35
	Maternal education (years)	14.81	2.33
	Annual family income	$37,676	21,881
Mothers with paid leave (*n* = 211, male infants = 95)	Gestational age at birth (weeks)	38.99	1.61
	Infant age (months)	29.18	4.17
	Maternal education (years)	16.05	2.13
	Annual family income	$54,313	23,342

TABLE 2

Toddler developmental outcomes descriptives

	Score			
Outcome	**Minimum**	**Maximum**	**Mean**	**SD**
PARCA-R cognitive	0	34	28.22	3.91
PARCA-R language	4	124	82.26	29.89
BITSEA problem	0	32	7.87	5.02
BITSEA competence	8	22	18.90	2.29

TABLE 3

Results of multiple regression analysis of Paid Leave on Toddler Language (PARCA-R) scores

	β	SE	*p*	Adj. R^2
Overall model		27.16	<.01	.17
Paid leave	.15	3.47	<.01	
Infant age	.36	0.37	<.01	
Infant sex	.18	3.10	<.01	
Gestational age	.12	0.99	.03	
Household income	.07	<0.01	.27	
Maternal education	.01	0.83	.88	

TABLE 4

Results of multiple regression analysis of paid leave on toddler BITSEA problem scores

	β	SE	*p*	Adj. R^2
Overall model		4.91	<.01	.06
Paid leave	−.91	4.07	.02	
Maternal education	−.21	0.22	.03	
Paid leave × maternal education	.98	0.26	.02	
Infant age	.01	0.07	.87	
Infant sex	−.11	0.56	.04	
Gestational age	−.01	0.18	.90	
Household income	−.21	<0.01	<.01	