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The role of length of maternity leave in supporting mother–child interactions and attachment security among American mothers and their infants

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Abstract

Maternity leave policies are linked to early childhood education and care policies, and in many countries, the length of leave policies determines the need for early care programs. The length of maternity leave varies greatly among mothers in the U.S. because of the absence of a universal policy for paid leave. This study examined associations among length of maternity leave, mother–child interactions, and attachment among American working mothers and their infants. This study consisted of secondary data analysis, and the participants were drawn from the nationally representative Early Childhood Longitudinal Study-Birth Cohort ($n \approx 3850$). Controlling for SES, the findings of path analysis suggest that the length of maternity leave was directly linked to the quality of mother–child interactions and indirectly linked to attachment security. These results have implications for the development of family policies that support the needs of infants and mothers during the first months of life.

Keywords: Attachment security, Maternity leave, Mother–child interactions

Background

The number of mothers of young children joining the workforce has been increasing steadily in the past decades, and in 2015, approximately 70% of all American mothers were part of the labor force (Women's Bureau United States Department of Labor 2016). These changes in the workforce have led many countries to enact policies, such as maternity leaves, to balance the needs of the youngest children and their working mothers (Human Rights Watch 2011). Maternity leave policies are an important component of early childhood education and care (ECEC) policies, and in many countries, maternity leave policies determine when out-of-home child care and education programs are needed (Kamerman 2000). Child development researchers and child policy analysts consistently recognize the importance of the link between these two policy systems (e.g., Kamerman 2000; Maccoby and Lewis 2003; Zigler and Hall 2000).

In the U.S., the length of maternity leave varies greatly among mothers because of the absence of a universal policy for paid leave. The effect of the duration of maternity leaves has been given extensive consideration in the literature studying labor markets, women's

health, and infant health (e.g., Galtry and Callister 2005). In contrast, infant psychological outcomes have been given less consideration in the discussion related to the length of maternity leave. The few previous studies addressing psychological outcomes have failed to include a representative sample, focusing mostly on middle class mothers and examining only direct effects (e.g. Clark et al. 1997; Feldman et al. 2004; Hyde et al. 2001; Pisciella 2008). This study addresses these gaps in the literature using a nationally representative sample of U.S. children with longitudinal data to examine the possible effects, both direct and indirect, of the length of maternity leave on mother–child interactions and on attachment security.

Maternity leave policy in the U.S. and in the World

Countries address the needs of families and infants with a variety of policies including maternity leave, parental or childrearing leaves, and ECEC policies (Kamerman 2001). The term maternity leave is generally used to indicate the time which a woman takes off from work during pregnancy and following the birth to recuperate physically from child birth and to take care of the new infant; this type of leave is typically available only to mothers (World Bank 2015). The term parental leave or child rearing leave is generally used to describe additional time after the post-partum period that a parent might take off from work to take care of an infant or toddler. This extended time is provided to parents in many nations as a means to provide care for infants before entering formal daycare and once maternity leaves are over (Moss and Deven 2006).

Comprehensive leave policies for mothers are the norm in industrialized countries. With the exception of the U.S., all the Organization for Economic Cooperation and Development (OECD) countries provide paid leave for mothers, either through maternity or parental leave (or both; World Bank 2015). For the OECD countries providing leave to mothers, the range of percentage of wages paid ranges from 29 to 100%, with 47% of the members providing 100%. In contrast, the U.S. maternity leave policy provided under the Family Leave and Medical Act (FMLA) of 1993 is not universal, applying, for example, only to employers with more than 50 employees (Waldfogel 1999). Nearly half of the workforce is not covered by the act, women are less likely than men to be covered, and single mothers and mothers of low socio-economic status (SES) are even less likely to be covered than married or middleclass mothers (Kamerman 2000). The FMLA policy is for unpaid leave, contrasting with the overwhelming provision of paid maternity leaves policies, not just among OECD countries, but worldwide. The only countries, other than the U.S., that do not require any paid leave for mothers are Papua New Guinea and Suriname (World Policy Forum 2015). The length of paid leave is at least 12 weeks in all of the OECD countries with the exception of the U.S. (World Bank, 2015).

The idea of a parent–child instant bond at birth has been highly controversial (Jansen et al. 2008), and research consistently found that both parent–child interactions and attachments take time to develop and are established after repeated interactions (Zigler and Hall 2000). These repeated interactions require that parents and children spend a significant amount of time together during the first year of life, because it takes time for parents to learn to read their infants' cues, and it takes time for children to learn to trust their caregivers and the world around them (Zigler and Hall 2000). This study proposes

that maternity leave plays a role in supporting quality of interactions and in the development of secure attachments.

Quality of mother–child interactions

The quality of parent–child interactions is central in the social and emotional development of the child (Bigelow et al. 2010; Gregory and Rimm-Kaufman 2008). Quality of interactions is typically defined by sensitivity, level of engagement, accuracy in reading each other's cues, and synchrony (Gregory and Rimm-Kaufman 2008).

Parent–child interactions are the process by which infants are initiated into the social world and social norms (Feldman 2007). Through this attunement, parents penetrate the child's inner rhythms, read and respond to emotional signs, teach children rules of communications and social exchange, and promote the child's development of the social self (Feldman 2007). Sroufe (2000) has argued that through these early interactions, the personality develops. Through these interactions, the infant learns to manage frustration, accept delay and disappointment, operate in the environment autonomously, and cooperate with others.

Most research on quality of parent–child interactions has been focused on mothers (e.g., Bigelow et al. 2010; Gregory and Rimm-Kaufman 2008). The levels of quality in mother–child interactions are established early in life. For example, Bigelow and colleagues (2010) measured maternal sensitivity in the interactions of mother and children at 4, 15, and 30 months, and found that the quality of mother–child interactions was stable across the first two and a half years of life. Similarly, Weinfield et al. (2002) found that the quality of mother–child interactions has shown continuity from the preschool age to the middle childhood years.

Mother–child interactions have been related to positive developmental outcomes such as emotional regulation, theory of mind, empathy, and attachment security. For example, Raikes et al. (2007) found that children who were observed to have higher levels of dyadic mutuality in their interactions with their mothers at 14 and 24 months of age had higher levels of self-regulation at 36 months of age, and greater attunement and smoother interaction resulted in greater levels of social competence. In contrast, children with high levels of negative affect in the parent–child relationship had lower levels of self-regulation, which can put them at risk for problems in social, emotional, and cognitive development. Similarly, Licata et al. (2016) found that high levels of emotional connectedness between mothers and infants at 7 months predicted levels of theory of mind at 4 years of age. Furthermore, Feldman (2007) found that higher levels of synchrony in mother–child interactions at 3 and 9 months of life predicted capacity for empathy during adolescence. Specifically, the degree of match between mother and infant behavior and the mutual influence and adaptation to each other's cues during infancy predicted a child's capacity for empathy at 13 years of age. The author concluded that the opportunity to share emotional experiences and emotional coordination with a significant adult during infancy is central to the child's ability to empathize with emotional states of others later in life.

The quality of interactions between mothers and children also affects attachment security. A meta-analysis of 66 studies and 4000 families found that maternal sensitivity in mother–child interactions was highly correlated with secure attachment (De Wolff

and van IJzendoorn 1997). Similarly, synchrony and reciprocity during interactions were highly predictive of secure attachment (De Wolff and van IJzendoorn 1997).

Attachment security

Attachment security is central to the understanding of social and emotional development in early childhood, and has consistently found to be a predictor of positive development in childhood (e.g., Oppenheim et al. 1988; West et al. 2013). Attachment is a special emotional relationship that involves an exchange of care, nurture, and pleasure. The attachment figure plays the key role of providing the framework for the development of internal working models (Bowlby 1988; Sherman et al. 2015) that result from the internalization of early experiences. These internal models are like blueprints for future relationships and constitute a set of coping skills that provide organization and coherence in the infant's mind. Eventually, working models are guidelines for interactions that the infant generalizes to other relationships in the course of life (Bowlby 1988; Sherman et al. 2015). When infants experience protection and comfort, and, at the same time, are given the opportunity to explore independently, they develop internal working models of self as independent, lovable, worthy, and self-reliant, prompting feelings of confidence and emotional regulation. These infants experience secure attachments, which allow them to use the caregiver as a secure base to explore the world freely (Bowlby 1988; Sherman et al. 2015). In contrast, when a child experiences rejection and the needs for comfort and exploration are ignored or are inconsistently met, the infant is likely to develop internal working models of the self as less worthy, less lovable, and less self-reliant, prompting feelings of rejection, hostility, anxiety, and ambivalence (Bowlby 1988). These infants experience attachment insecurity, and they view themselves, relationships, and the world as unsafe and unreliable (Bowlby 1988).

Attachment dependency is a form of attachment insecurity and constitutes emotional dependence and over-reliance on the caregiver for protection and love. The child develops internal working models of a caregiver as someone that is unstable, unreliable, and whose love is contingent on the child's neediness behaviors (Blatt 1974). As a result, the child displays clinginess, feels too insecure to explore the world freely, and is unable to use the caregiver as a secure base. These behaviors result in problematic and insecure relationships later in life (Bowlby 1988; Sherman et al. 2015).

Attachment security has been found to predict positive developmental outcomes, such as, pro-social behaviors, competence with peers, social skills, and empathy (Lamb et al. 1985). On the other hand, meta-analysis studies found that attachment insecurity predicts internalizing behaviors in early childhood (Madigan et al. 2013), externalizing behaviors during childhood (Fearon et al. 2010), and problem behaviors in late childhood (O'Connor et al. 2012).

The first months of life are key to the development of secure attachments (Bowlby 1988). Attachments begin to form from birth, they are established by the ninth month of life, and by 12–14 months, they are finalized. Once attachments are formed, they remain relatively stable through childhood (Gloger-Tippelt et al. 2002), adolescence (Hamilton 2000), and adulthood (Waters et al. 2000).

The belief in a critical stage for infants to form a bond with their mothers has been controversial. Yet, research has shown that there are underlying biological processes

that cause certain bonding behaviors to emerge with more intensity during the post-partum period (Jansen et al. 2008). During labor and the post-partum period, a woman releases the hormone oxytocin. This hormone has been shown to affect maternal caregiving behavior and pair bonding (Feldman et al. 2011). Associations between levels of oxytocin released in the human mother and the quality of mother child interactions have been found consistently (e.g., Bernaerts et al. 2017; Feldman et al. 2011; Mehta et al. 2016), suggesting that the post-partum period may be a primed biological period for the development of healthy attachments. Policies that address issues such as the duration of maternity leaves have the potential to facilitate time for mothers and infants to spend together and to develop secure attachments.

The effect of length of leave on mother–child interactions and attachment

Few studies explored the link between length of maternity leave and mother–child interactions or attachment. Feldman and colleagues (2004) compared a group of mothers who took maternity leaves longer than 12 weeks to a group of mothers who took maternity leaves shorter than 12 weeks. The authors found than women in the long leaves group had better understanding of child development, had higher levels of preoccupation with their infant, and reported that motherhood had a better impact on their self-esteem and their marriage. In addition, longer maternity leaves were related to better job adaptation. However, this study included a sample of married higher socio-economic status women and did not include observations of mother–child interactions.

Clark and colleagues (1997) found that shorter leaves resulted in lower levels of maternal sensitivity and increased negative affect during interactions with the child. This study included a sample of 198 married working mothers of middle income status and used video-taped mother–child interactions when the infants turned 4 months. This study controlled for infant gender, birth order, employment location (in or out of the home), breastfeeding, and maternal education. However, this study did not include any measures or observations of infant level well-being or development.

One study found a link between maternity leave and attachment. In a nationally representative sample, when comparing ambivalent and non-ambivalent infants, infants were more likely to be classified in the ambivalent category when the mothers did not take maternity leave (Pisciella 2008). Ambivalent attachment refers to infants who are insecurely attached, exhibit separation anxiety, are unable to use the caregiver as a secure base, and develop internal working models of ambivalence towards attachment figures, because caregivers are usually inconsistent and unpredictable (Bowlby 1988). This study gives evidence to the links between maternity leave and attachment security. However, this study did not look at the indirect effects of length of maternity leave and at the role of quality of mother–child interactions.

Socio-economic status

Socio-economic status (SES) plays an important role in the ways mothers take maternity leave. First, SES is closely related to whether or not a mother is eligible to any leave as covered by the FMLA, as lower SES women are the least likely to be included in the policy because of the FMLA's restrictions (Kamerman 2000). Second, for mothers who are covered, the ability to take advantage of this unpaid leave is highly related to SES and her

ability to afford time away from work. Similarly, the likelihood of the leave being paid is related to SES, as higher paying jobs are more likely to offer a paid leave (Human Rights Watch 2011). Thus, SES can affect the timing of the mother returning to work and the quality of the home environment as well as the income of the family and the experience of poverty during infancy.

Extensive research has supported the association between socio-economic status and mother–child interactions (e.g., Belsky and Jaffee 2015; Brooks-Gunn and Duncan 1997; Grolnick et al. 2002; Hart and Risley 1995; Klebanov et al. 1994; McLoyd 1998; Repetti et al. 2002; Vernon-Feagans and Cox 2013). For example, parents in poverty reported feeling less effective as parents and had been observed to be less affectionate with their children. Similarly, poverty increases the risk of authoritarian parenting and harsh discipline (Gibson-Davis and Gassman-Pines 2010).

In sum, maternity leave, mother–child interactions, and SES are intertwined in many ways, and the study of the effects of length of maternity leave needs to take into account SES.

The present study

Length of maternity leave varies greatly among American mothers and the effects of length of maternity leave on mother–child interactions and attachment have not been extensively studied. The present study had three goals. First, this study explored the direct effects of the length of maternity leave among working mothers on the quality of mother–child interactions. Second, this study assessed the direct effects of mother–child interactions on attachment security and attachment dependency. Third, this study explored whether length of maternity leave indirectly affected the levels of attachment security by affecting the quality of mother–child interactions. Three hypotheses were proposed. Hypothesis 1 predicted that longer maternity leaves would be associated with higher levels of mother–child interactions. Hypothesis 2 anticipated that higher levels of quality mother–child interactions would be associated with higher levels of attachment security and lower levels of attachment dependency. Hypothesis 3 predicted that longer maternity leaves would be associated with higher levels of quality mother–child interactions, which in turn would be associated with higher levels of attachment security and lower levels of attachment dependency. Since SES is related to the length of maternity leave (Human Rights Watch 2011; Kamerman 2000), this study included maternal SES as a variable in the models.

Methods

Participants

This study used data collected in the Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) that includes a nationally representative sample of children born in the year 2001 in the U.S. of America (https://nces.ed.gov/ecls/birth.asp). The ECLS-B tracked children from birth through their entry to kindergarten. The present study analyzed data from the first two waves of data collection and collected when children turned 9 months and 2 years of age. When children were 9 months, mothers were interviewed, and children and mothers were observed in different tasks. Similarly, children were assessed and mothers were interviewed at 2 years of age.

As seen in Table 1, the total number of children in the ECLS-B is about 10,700, but only the children of mothers considered "working mothers" by the first round of data collection at 9 months were included in this study. Our analytic sample was restricted to working mothers who responded to the question regarding length of their maternity leave, and had a non-missing value on the ECLS-B base weight W2C0. This weight was applied to children whose parents participated in both waves of date collection. Selecting cases with a valid value of W2C0 for working mothers yielded a sample size of approximately 3850. In addition, ECLS-B weights W2C1–W2C90 adjusted for non-participation, so the results are applicable to the original sample. When the data are analyzed using these weights, the results are representative of all children born in the U.S. in the year 2001 (Nord et al. 2004).

Measures

Since this study constitutes secondary data analysis of the ECLS-B's first two rounds of data collection, all the measures used were selected from the ECLS-B study.

Working mother status

At the 9-month parent interview, mothers were asked if they were employed, working for pay, as of the past week. This was answered on a yes/no scale. This measure was used to identify the sample of working mothers included in the study.

Table 1 Characteristics for the ECLS-B sample and the sample for the present study

Characteristics	Total ECLS-B %	Working mother %
Child's gender		
Male	51.2	51.9
Female	48.8	48.1
Mother's ethnicity		
White	53.7	55.7
African American or black	13.7	14.5
Hispanic white	6.6	14.6
Hispanic non-white	8.7	7.5
Asian	2.7	
Pacific Islander	.2	.2
Native American	.5	.4
More than 1 race (not Hispanic)	3.9	4.3
Mother's marital status		
Married	67.3	67.9
Unmarried	32.7	32.1
Maternal employment status		
Working	52.7	100
Not working	47.2	
N	10,700[a]	3850[a]

Data from ECLS-B restricted-use data file. Weighted frequencies are representative of the children born in the U.S. in the year 2001

[a] Samples sizes are rounded to the nearest 50, consistent with the requirements of the National Center for Education Statistics

Length of leave

During the 9-month interview, mothers who indicated they took maternity leave were asked to specify the duration of their leave. This leave can typically include some weeks before the birth of a child. Mothers were also asked how old in weeks their child was when they returned to work. This question was a better indicator of length of leave for the present study, because it addressed the number of weeks after delivery that a mother was potentially able to spend with her child before returning to work. Therefore, the age of the child in weeks when a mother returned to work was used to measure length of leave.

Mother–child interactions

Mother–child interactions were assessed when the child was 9 months old with the Nursing Child Assessment Teaching Scale (NCATS; Andreassen et al. 2005). The NCATS consisted of asking the mother to teach the child a task that is slightly beyond his or her abilities, which created a certain amount of distress. Trained observers paid attention to the quality of the interactions and the level of responsiveness between mother and child rather than on success in the task. There were 73 items, and observers indicated whether a behavior was observed or not during the task. Examples of these items are whether the mother was face to face during the task and whether children displayed disengagement.

The scale comprised four maternal behavior subscales, including sensitivity to cues, response to distress, socio-emotional growth fostering, and cognitive growth fostering. In addition, there were two infant behavior subscales, including clarity of cues and responsiveness to caregiver. Responses were summed for each subscale, and total scores for parent, child, and dyad were calculated with higher scores indicating more positive mother–child interactions.

The NCATS is one of the most widely used scales for measuring mother–infant interaction (Barnard et al. 1984). Content validity for the NCATS is derived from the Bayley test of infant development (Bayley 1969) the Merrill-Palmer (Stutsman 1948) and Stanford–Binet (Terman and Merrill 1973) scales. Scores on the NCATS correlate with children's subsequent cognitive abilities (Barnard et al. 1984; Bee et al. 1982; Sumner and Spietz 1994). The NCATS has high internal consistency; Cronbach α for the Maternal Behavior subscale is .87 and for the Infant Behavior subscale is .81. Test–retest reliability is .85 for the Maternal Behavior subscale and .55 for the Infant Behavior subscale (Sumner and Spietz 1994). The dyad total score had a reliability of .72 (Andreassen et al. 2005) and was used in this study.

Attachment security and dependency

Two dimensions of attachment were measured: attachment security and attachment dependency. The Toddler Attachment Sort-45 (TAS-45) was used to measure attachment quality during the home visit when the child was 2 years of age. This measure was adapted from the Attachment Q-Sort developed by Waters and Deane (1985). The original measure includes 90 items and is used as a home observation of a child's level of attachment to the parent, measuring the dimensions of security and dependency. The sorting procedure consists of cards with items that describe children's behaviors with

mothers in stressful situations. The observer sorts the cards into piles reflecting whether a behavior was highly characteristic, characteristic, somewhat characteristic, somewhat uncharacteristic, or highly uncharacteristic of the child. The TAS-45 includes 45 items depicting similar behaviors and was developed specially for the ECLS-B (Andreassen and West 2007). Sample items in the TAS-45 are "child gets upset if mother leaves and shifts to another place" and "child hugs and cuddles against mother without being asked to do so." The TAS-45 yields two continuous scores, one for attachment security and one for attachment dependency. These scores are traditionally obtained by researchers using the AQS following the guidelines of Waters and Deane (1985). The security score indicates the child's ability to use the adult as a secure base. The dependency score is an indication of clinginess to the parent, attention-seeking, and distress by separation. Both of these scores range from − 1 to 1, with scores closer to 1 indicating high ability to use the adult as a secure base for security, or high clinginess, attention-seeking, and distress for dependency.

The two most common assessments of attachment are the Strange Situation (Ainsworth et al. 1978), which is a laboratory-based procedure, and the Attachment Q-Sort (AQS; Waters and Deane 1985), which was developed as an alternative to the Strange Situation. The TAS-45 describes children's attachment security and dependency based on naturalistic observations. The advantages of the TAS-45 include home observations, the availability of continuous scores that account for individual differences, and its applicability in a range of countries and cultures (Posada et al. 1995).

TAS-45 scorers must achieve 80% reliability or higher (Andreassen and West 2007). Validity of the TAS-45 as a measure of toddler-parent attachment has been reported by Spieker et al. (2011). The TAS-45 Security score was associated with more dyadic mutuality, higher language and competence scores, and lower problem scores. Discriminant validity was evidenced by a lack of associations with the TAS-45 Dependency score and Security scores (Spieker et al. 2011). The TAS-45 was used by several large-scale studies. For example, the TAS-45 was used to examine the associations between food security during infancy and subsequent attachment behaviors in toddlerhood and the associations between attachment security and child obesity (Anderson and Whitaker 2011; Zaslow et al. 2009).

Family socio-economic status

ECLS-B researchers computed a composite variable for socio-economic status from five components including both maternal and paternal education, maternal and paternal occupation, and income. The SES score is an average of these five components after they were standardized (Flanagan and West 2004). These scores range from − 2.1 to 2.25 with higher scores indicating higher SES.
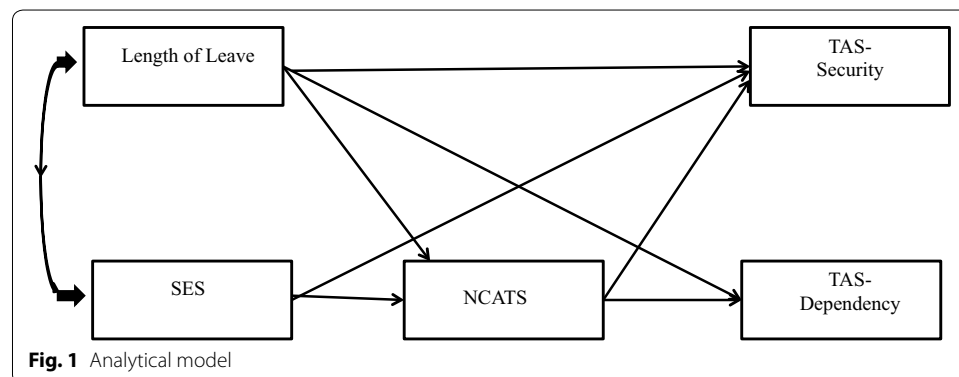
Procedure

This study consisted of secondary data analysis of the ECLS-B collected when the children were 9 months and 2 years of age. The families were selected using birth certificates, and they were recruited using the information available in the birth certificates. Children were sampled by occurrence of birth within a set of primary sampling units defined by counties or county groups.

Mothers and children were visited at home at both times, and these visits included the observations of mother–child interactions at 9 months and completion of the attachment Q-sort at 2 years. Trained staff video-taped mother–child interactions during the home visits. In addition, a parent interview was administered, which included all the questions related to maternal employment, maternity leave, and socio-biographic variables when the children were 9 months (National Center for Education Statistics 2005). All participants consented to participate in this study.

Analytic plan

The three hypotheses of the study proposing direct and indirect effects of length of maternity leave on attachment were estimated by path analysis of the analytical model presented in Fig. 1. Path analysis is a subset of SEM (Ullman and Bentler 2003), and is used to examine relationships between two or more variables. It is based upon a linear equation system, and is used mainly in the attempt to understand comparative strengths of direct and indirect relationships among a set of variables (Chou and Bentler 1995). In this way, path analysis is an appropriate answer to our research questions, since in path analysis, mediated pathways or indirect effects can be examined (Ullman and Bentler 2003). Furthermore, path analysis was chosen, because it assesses the relationships among measured variables, which is the case of the variables in the present study (Chou and Bentler 1995).

Following the approach of Kenny (2009), the presence of significant indirect effects in path models was considered a mediation effect. This approach is widely recommended in mediation research (MacKinnon et al. 2007; MacKinnon 2008). All analyses were conducted through path models in Mplus which allows for the use of sampling weights, adjusts for complex sample designs, and includes procedures for handling missing data (Muthén and Muthén 2006). The model was tested using standardized coefficients obtained with maximum-likelihood method of estimation. The maximum-likelihood method has shown to be a state-of-the-art technique for dealing with missing data, highly recommended by researchers (Schafer and Graham 2002), and is robust to non-normality in structural equation modeling (Enders 2001). In addition, the jackknife resampling procedure was used to estimate coefficients. This procedure was recommended by ECLS-B researchers as an effective way of calculating path coefficients. Similarly, this

Fig. 1 Analytical model

procedure was recommended by researchers comparing it to other replication methods when testing them using the same data set (Stapleton 2008).

Using Hu and Bentler's (1999) specifications, two fit indices were used to determine model fit, including the Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Square Residual (SRMR). These indices were chosen because of the need to use replicate weights for the analysis, as indicated by ECLS-B researchers. When these weights are included in the analysis, obtaining non-parametric fit indices, such as Chi squares, is not possible. According to Hu and Bentler's specifications (1999), models with RMSEA higher than .10 have poor fits, models lower than .10 are considered adequate, and models of .05 or lower are considered to have good fit. Similarly, models with SRMR values smaller than .08 are considered good fit, a model fit of 0 is considered perfect fit, and the smallest estimate is preferred (Hu and Bentler 1999).
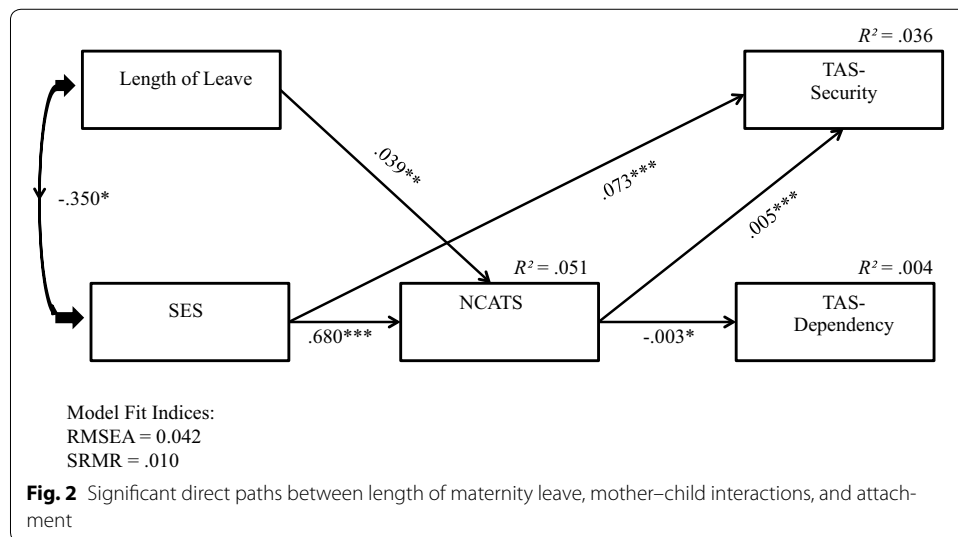
Results

The descriptive statistics are presented in Table 2.

The results show that the RMSEA for the model was .042 with a 90% confidence interval of .018–.071, which indicates a good fit. The SRMR value was .010, which is considered good fit also (Hu and Bentler, 1999). Figure 2 illustrates the direct significant paths found, and Table 3 presents the decomposition of effects.

Table 2 Descriptive statistics

Variables	Min	Max	*M*	SD
Leave (in weeks)	1	52	12.57	8.86
SES	− 1.91	2.25	.03	.81
Interactions	26.40	70	49.99	5.83
Security	− .86	1.00	.44	.36
Dependence	− .88	.86	− .12	.31

Fig. 2 Significant direct paths between length of maternity leave, mother–child interactions, and attachment

Table 3 Decomposition of effect, direct and indirect paths

Predictors	Estimate	S.E.	Est./S.E.
Direct paths			
Dependent variable: TAS security			
NCATS	.005***	.001	3.935
Leave	.000	.001	− .089
SES	.073***	.011	6.727
Dependent variable: TAS dependence			
NCATS	− .003*	.001	− 2.152
Leave	− .001	.001	− 1.506
Dependent variable: NCATS			
Leave	.039**	.013	2.932
SES	.680***	.161	10.442
Indirect paths			
Dependent variable: TAS security			
Leave + NCATS	.000*	.000	2.325
SES + NCATS	.008***	.002	3.981
Dependent variable: TAS dependence			
Leave + NCATS	.000+	.000	− 1.772
SES + NCATS	− .005*	.002	− 2.182

* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$, + $p \leq .10$

Hypothesis 1 explored the relationship between length of maternity leave and mother–child interactions. Length of leave was significantly associated with quality of mother–child interactions (Estimate = .039, $p = .003$). The second hypothesis explored the relationship between mother–child interactions and attachment. Higher levels of quality of mother–child interactions were associated with attachment security (Estimate = .005, $p = .000$). In addition, lower levels of quality of mother–child interactions score were associated with attachment dependency (Estimate = − .003, $p = .031$). The third hypothesis explored an indirect effect of length of maternity leave on attachment security through the effects of mother–child interactions. The indirect effect of length of leave on attachment security was found significant, being mediated by quality of mother–child interactions (Estimate = .000, $p = .020$). The indirect effect of length of leave on scores in attachment dependence through the mediation of quality of mother–child interactions was found to be marginally significant (Estimate = .000, $p = .076$).

Following the recommendations of Stage et al. (2004), the effects sizes for each path were considered to be equal to the standardized coefficients of each of the paths. The authors propose that an effect smaller than .10 is considered small, an effect close to .30 should be considered medium size or moderate, and an effect of .50 or larger should be considered a large effect. The effect sizes in this study were regarded as small. The only exceptions were the effects of SES on quality of mother–child interactions, which were viewed as large. Effect sizes need to be interpreted in context; effects sizes in similar studies such as the child care studies were all considered small (McCarthney and Rosenthal 2000). Because of the large effect sizes of SES on mother–child interactions, the moderation effects of SES were tested. SES did not prove to have a significant moderating effect between length of leave and mother–child interactions (Estimate = .024, $p = .14$).

Discussion

Maternity leaves constitute a basic form of support for families immediately after the birth of a child. The goal of this study was to look at the role of length of maternity leave of working women in the U.S. in supporting the development of quality–mother child interactions and attachment with their children.

The effect of maternity leave on the quality of mother–child interactions

One of the main findings of this study was that length of maternity leave had a direct effect on the quality of mother–child interactions. This finding is of significance, because the quality of interactions is established early in life and remains stable from infancy to middle childhood (e.g., Weinfield et al. 2002). Similarly, quality of mother–child interactions during infancy has been shown to predict secure attachments (De Wolff and van IJzendoorn 1997), levels of empathy (Feldman 2007), and academic success later in life (Gregory and Rimm-Kaufman 2008).

The significant effect found between length of maternity leave and quality of mother–child interactions is consistent with the finding of Clark and colleagues (1997) that shorter maternity leaves result in more negative mother–child interaction. The findings of the present study support what has been argued by many developmentalists (e.g., Belsky 2001; Zigler and Hall 2000), namely that the ability to spend time with a child before the return to work might help a mother develop higher levels of attunement to her child's needs or higher levels of sensitivity towards her child's cues without the stress of separation. Overall, this body of work indicates that the mother–child interactions are sensitive to the amount of time a mother has to get to know her child before she returns to work. These results should inform the development of policies that support the needs of infants and working mothers.

The effect of maternity leave on attachment

Another important result of this study was that the effect of the length of maternity leave on attachment was mediated by the quality of mother–child interactions. This finding is significant because of the central role of attachment in child development (e.g., Lamb et al. 1985; Oppenheim et al. 1988; West et al. 2013). Length of maternity leave has played an important role in supporting the development of secure attachments because of its effect on the quality of mother–child interactions.

The results bring new light on an enduring research issue, namely the relationship between non-maternal child care in the months of life and attachment. The NICHD ECCRN studies (1997, 1999) found that more than 10 h a week in child care during the first year of life put a child at risk of developing insecure attachments and aggressive behaviors when a mother had low levels of sensitivity (NICHD 1997). The results of this study confirm that the influence of length of maternity leave on child attachment is observed when taking into account the role of dyadic mother–child interactions. The results also confirm that maternity leave policies might be an appropriate way of addressing the need for infants to develop secure attachments.

Limitations

An important limitation of the present study is the issue of causality. It is possible that mothers who are more likely to develop higher levels of quality in their interactions are choosing to take longer leaves. Similarly, although this study controlled for the effects of SES, the duration of maternity leaves in the U.S. is highly related to the ability to take unpaid time off, to be covered by FMLA policy, or to having an employer who offers paid maternity leave. All these factors are tightly intertwined with income and SES, thus possibly influencing a mother's ability to take a longer leave.

The use of a nationally representative sample is ideal when making policy recommendations. Yet, some limitations stem from the use of secondary data analysis as some variables of interest, such as maternal individual preferences, were not included in the survey.

Similarly, father–child interactions were not assessed in this sample. It is left for further research to include the role of fathers. Starting with Sweden, a few countries in the world have developed paternity leave policies (Human Rights Watch 2011). In some cases, paternity leave constitutes a form of child care when the mother returns to work. Further study can assess if longer leaves resulting from a combination of maternal and paternal leaves predict higher levels of father–child interactions and higher level of involvement of fathers with their children later in life.

Implications for policy

The results of this study have several implications for policy affecting mothers and their infants, including implications for maternity leave coverage, length, and compensation. The findings indicate that the length of maternity leave had a direct impact on the quality of mother–child interactions and an indirect impact on attachment. One policy recommendation is expanding the FMLA policy to cover more workers, including those employed in companies with a workforce of less than 50 employees. In this way, a larger number of infants might be able to benefit from spending more time with their mothers during the first weeks of life. Since developing quality interactions and forming attachments is a universal need of infants, a universal policy will best address the needs of working American families.

These findings should also inform policy regarding the length of leave provided. Although the average leave in the U.S. and in the current sample lasted about 12 weeks, many women in the U.S. return to work during the first weeks of their children's lives (Human Rights Watch 2011). A policy that ensures a length of leave needs also to address the need for some leave to be paid. Longer unpaid leave might not result in longer maternity leaves due to the loss of income associated with an unpaid leave during the months following childbirth. These circumstances can be highly stressful for mothers and families.

Implementing some form of paid leave has been controversial in the U.S., due to the expected cost of such policies. Yet, examples of state-level policies show that implementing some compensation for maternity leave does not have to be costly and that this cost does not have to be carried by employers (Zigler and Hall 2000). Studies analyzing the effect of paid leave in the State of California have shown that paid leave has extended the average leave per women by 4–6 weeks, even longer in the case of low SES working

mothers (Guendelman et al. 2014), and had a positive impact on employers and businesses (Armenia 2014). Similarly, in 2014, Rhode Island adopted a paid leave policy, and public savings were reported in medical costs and unemployment (Mejeur and Poppe 2014). These examples point at the feasibility of implementing a paid policy that assures mothers can take spend time with their infants without experiencing the strain of complete income loss. The results of this study suggest that federal policies should follow the example of states and insure all American infants have similar opportunities.

Conclusion

Using a nationally representative sample with a longitudinal design, this study found that there is a direct effect between length of maternity leave and the quality of mother–child interactions, and an indirect effect between the length of maternity leave and attachment. These results add to the body of literature that should inform policies to support the role of parenting in infant development, and to address the needs of infants during their first months of life.

The implementation of comprehensive and universal maternity leave policy can complement child care policies. Both quality child care and maternity leave policies constitute solutions to similar needs. The results of this study support the need for parents to have the opportunity to choose to take maternity before infants enter child care. While quality child care can results in positive developmental outcomes for the infants, maternity leave can ensure that mothers have time off from work. This way, maternity leave can give mothers the opportunity to spend time with their infants, engage in positive and stress-free interactions, and learn to read a child's cues before they negotiate the stress of balancing parenting and work. Ultimately, a combination of comprehensive maternity leave and child care policies will give each family the opportunity to have some choice in timing and combination of work, leave, and child care.

Abbreviations
ECEC: early childhood education and care; U.S.: United States; OECD: Organization for Economic Cooperation and Development; FMLA: Family Leave and Medical Act; SES: socio-economic status; NICHD: National Institute of Child Health and Development; NICHD-SECCYD: National Institute of Child Health and Development Study of Early Child Care and Youth Development; ECCRN: Early Child Care Research Network; ECLS-B: Early Childhood Longitudinal Study, Birth Cohort; NCATS: Nursing Child Assessment Teaching Scale; TAS-45: Toddler Attachment Sort-45; RMSEA: Root Mean Square Error of Approximation; SRMR: Standardized Root Square Residual.

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Availability of data and materials
This study is based on data from the Early Childhood Longitudinal Study-Birth Cohort (ECLS-B; https://nces.ed.gov/ecls/birth.asp). The data files are restricted-use available only to qualified researchers who are granted a restricted-use data license. More information about ECLS-B data policies can be found here: https://nces.ed.gov/ecls/birthdatainformation.asp.

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