

Paternity Leave-Taking and Father Engagement

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ABSTRACT

Evidence suggests that paternity leave-taking is associated with higher levels of father involvement, but research has been limited in its focus on cross-sectional analyses and indicators of father involvement used. This study utilizes national longitudinal data to examine whether paternity leave-taking is associated with two indicators of father engagement when children are infants, whether paternity leave-taking is associated with trajectories of father engagement during the first few years of a child's life, and whether the relationships between paternity leave and father engagement are explained by fathering commitments and attitudes. Results suggest that longer periods of leave are associated with more frequent engagement in developmental tasks and caretaking when children are infants as well as during the first few years of children's lives. There is also evidence that father attitudes partially explain the relationships between length of paternity leave and father engagement.

Keywords: fatherhood; father-child relations; family policy; parental investment/involvement; provider role; work-family balance

### Paternity Leave-Taking and Father Engagement

Many U.S. studies have focused on work-family balance, but research has largely ignored one key work-family policy: paternity leave. Few studies have focused on paternity leave because of a lack of data on the topic and the lack of a national paternity leave policy. Nonetheless, paternity leave can provide fathers with opportunities to practice parenting skills and be engaged in their child's life while also fulfilling breadwinning expectations. Thus, paternity leave can enable fathers to adhere to the expectations of both traditional and new fatherhood by encouraging fathers to contribute both social and financial resources to their families (Galinsky, Aumann, & Bond, 2011; Marsiglio & Roy, 2012). Yet, numerous fathers may not have access to leave, or may not be willing to take leave, due to workplace practices that discourage leave-taking in the U.S. (Albiston & O'Connor, 2016; Coltrane et al., 2013).

There is also evidence that paternity leave-taking is positively associated with subsequent father involvement. Studies from Europe indicate that fathers who take longer periods of leave engage in childcare tasks more frequently and report closer relationships with their young children than fathers who take shorter periods of leave (Haas & Hwang, 2008; Huerta et al., 2014; Tanaka & Waldfogel, 2007). There is more limited evidence from the U.S. that paternity leave-taking, and especially longer periods of paternity leave, are associated with higher levels of father involvement (Neponmyaschy & Waldfogel, 2007; Pragg & Knoester, 2017; Seward et al., 2006). Understanding whether paternity leave leads to greater father involvement is important because father involvement is associated with numerous positive outcomes among children (Lamb, 2010; Sarkadi et al., 2008).

Previous research on paternity leave and father involvement in the U.S. overwhelmingly focuses on involvement at one point in time, usually when children are infants, and utilizes limited measures of involvement. Thus, more research is needed to assess whether paternity

leave is associated with various types of father involvement and whether taking leave encourages fathers to remain involved as their children get older.

We attempt to address these gaps by utilizing longitudinal data from a national sample to examine whether taking paternity leave and length of leave are associated with two indicators of father engagement – engagement in developmental activities and caretaking. In the process, we analyze whether paternity leave is associated with longitudinal trajectories of father engagement over the first few years of a child’s life. We also consider whether prenatal involvement and father attitudes may explain the associations between paternity leave and father engagement.

### BACKGROUND

Access to paternity leave is important because there have been changing expectations for fathers. Traditional expectations of fathers serving primarily as breadwinners have expanded to emphasize a new fatherhood ideal that also encourages fathers to be engaged in their children’s lives (Marsiglio & Roy, 2012). Despite these shifting attitudes, the breadwinner ideal persists in perceptions of American fatherhood, contributing to a “new male mystique” in which men struggle to meet the demands of both traditional and new fatherhood ideals (Aumann, Galinsky, & Matos, 2011). Furthermore, gendered, employer, and economic practices continue to largely discourage paternity leave-taking for U.S. men, resulting in increased work-family conflict for fathers (Acker, 1990; Albiston & O’Connor, 2016; Aumann et al., 2011; Coltrane et al., 2013).

Access to paternity leave is also important because spending time with children from birth is beneficial to both parents and children. Engaging in caregiving and developmentally appropriate activities (e.g., reading, playing) fosters young children’s developmental growth, attachment to parents, and contributes to better health, fewer behavioral problems, and more positive educational outcomes (Lamb, 2010; Lamb & Lewis, 2010; Pleck, 2010; Sarkadi et al., 2008; Waldfogel, 2006). Involvement with children can also provide joy, encourage feelings of

generativity, and help establish father identities that emphasize parent-child interactions (Lamb & Lewis, 2010; McKeering & Pakenham, 2000). In fact, many fathers state that being engaged in their child's life is their most important role as a father (Brandth & Kvande, 1998; Edin & Nelson, 2013) and most American men believe that employers should offer paternity leave (Harrington et al., 2014; Horowitz et al., 2017).

Constraints and opportunities to take paternity leave are shaped by public policies, gendered practices, employer policies, and economic patterns. Most countries provide paid maternity leave and 44% of countries have policies that allow fathers to take paid leave (Heymann & McNeill, 2013). However, the U.S. does not have any statutory paid leave policies. Instead, the Family and Medical Leave Act (FMLA) allows employees who meet eligibility requirements to take up to 12 weeks of unpaid leave after childbirth (Han & Waldfogel, 2003; Heymann & McNeill, 2013). In addition, five states offer temporary disability insurance (TDI) with partial wage replacement to mothers, and three of these states expand on TDI coverage to provide paid family leave to mothers and fathers (Winston, 2014). Some workers may also have access to employer-based leave programs, but these are more common in high-paying jobs (Albiston & O'Connor, 2016). This piecemeal system prevents many workers from having access to leave; 40-50% of employees are not eligible for leave under FMLA, statutory paid leave is not available to fathers in 47 states, and only 17% of companies offer paid paternity leave to some employees (Melamed, 2014; SHRM, 2015; Winston, 2014).

### CONCEPTUAL FRAMEWORK

Lamb et al. (1985) recognize three dimensions of father involvement: engagement (direct interaction with children), accessibility (being available to children), and responsibility (making decisions about and/or arrangements for children). In this study, we highlight two indicators of

engagement – engagement in developmental tasks and caretaking. Our conceptual framework considers patterns of father engagement, the implications of paternity leave, and the relevance of father identities for both paternity leave-taking and father engagement.

Patterns of fathers' engagement in developmental tasks and caretaking with young children are unclear. On the one hand, studies suggest that fathers increase their involvement in developmental and caregiving activities from when their children are infants to approximately age four (Planalp & Braungart-Rieker, 2016; Planalp et al., 2013). Yet, other research suggests that father engagement in caretaking is relatively stable over the first few years of a child's life (NICHD Early Child Care Research Network, 2001) or that father engagement in developmental and caretaking activities declines over time (Lamb, Chuang, & Hwang, 2004). By further examining trajectories of father engagement, results from this study should contribute to our understanding of patterns of father involvement during early childhood.

#### *Paternity Leave and Father Engagement*

Despite many fathers' desires to be actively engaged in their children's lives, they often experience challenges in fulfilling the competing demands associated with traditional and new fatherhood (Aumann et al., 2011; Doucet, 2013). Paternity leave may help to alleviate some of these competing demands, at least temporarily (Rehel, 2014; Tanaka & Waldfogel, 2007). In addition, paternity leave may allow fathers to bond more with their children and learn how to engage in parenting tasks (Rehel, 2014).

Although fathers spend less time with children than mothers generally, variations are greater for parenting behaviors (e.g., caretaking tasks) that have traditionally been performed by mothers (Bianchi, Robinson, & Milkie, 2006; Hofferth et al., 2013; Pleck, 2010). Such tasks are less normative for fathers and often need to be learned (Hofferth et al., 2013; Rehel, 2014).

Having time off after the birth of a child may provide fathers with the opportunity to learn these behaviors together with mothers, allowing fathers to gain parenting mastery (Rehel, 2014). As a result, fathers may begin to feel comfortable engaging in these tasks, view themselves (as well as be viewed by others) as competent caregivers, and be more involved in their children's lives. The more time that fathers are able to take off for paternity leave, the more time they would have to gain parenting experience and bond with their child. The process of developing an attachment to one's child may have a lasting influence as father involvement early in a child's life is a key predictor of later engagement (Cabrera, Fagan, & Farrie, 2008; Roggman et al., 2002). Thus, paternity leave-taking may lead to increased father engagement in infancy, and this higher level of engagement may persist throughout a child's life.

Indeed, there is evidence that paternity leave-taking is associated with more frequent father involvement. International studies suggest that fathers who take paternity leave are more likely to engage in developmental tasks with infant children such as playing (Denmark) and caretaking tasks with infant children such as feeding (Denmark and UK), bathing (UK), changing diapers (Denmark and UK), and getting up at night (UK) (Hosking, Whitehouse, & Baxter, 2010; Huerta et al., 2014; Tanaka & Waldfogel, 2007). In addition, leave-taking increases the likelihood that fathers engage in developmental tasks such as reading to children (UK) and caretaking tasks such as putting children to bed (Australia and UK), brushing teeth (Australia), and bathing (Australia) when children are 2-3 years old (Huerta et al., 2014). Length of paternity leave is also associated with more frequent involvement; Haas and Hwang (2008) found that days of leave taken increased the frequency that Swedish fathers engaged in more time spent with children, childcare tasks, and physical care tasks.

Similarly, U.S. studies suggest that fathers who take paternity leave are more likely to change diapers, prepare food for, and help dress infant children; they also take young children to the doctor, read to 2-3 year old children more frequently, and have higher overall levels of involvement with one and five year old children than fathers who do not take leave (Huerta et al., 2014; Pragg & Knoester, 2017; Seward et al., 2006). There is also evidence that father involvement varies by length of leave; Pragg and Knoester (2017) found that weeks of paternity leave taken were positively associated with father engagement when children were one and five years old, and Neponmyaschy and Waldfogel (2007) found that paternity leave-taking was only associated with more frequent engagement in caretaking tasks for fathers who took two or more weeks of leave. Although some studies find that leave-taking is unrelated to some indicators of involvement (Hosking et al., 2010; Seward et al., 2006), most evidence suggests that paternity leave-taking and length of paternity leave are associated with greater father involvement. Thus:

*Hypothesis 1:* Fathers who take paternity leave will have higher levels of subsequent father engagement than fathers who do not take paternity leave, and these higher levels of engagement will persist throughout the first few years of a child's life.

*Hypothesis 2:* Longer periods of paternity leave will be associated with higher levels of subsequent father engagement, and these higher levels of engagement will persist throughout the first few years of a child's life.

*Fathers' Commitments and Attitudes, Paternity Leave, and Father Engagement*

Although research suggests that paternity leave-taking and father involvement are related, it is also likely that the degree to which fathers become involved during and after paternity leave varies by the nature, salience, and commitments that are connected to their father identities. Father identity theory recognizes that men develop their father identities through their lived



experiences and social interactions. Consequently, men attribute meaning and significance to being a father and to their perceptions of its accompanying roles. Father identities are more salient when fatherhood is perceived to have greater importance compared to other statuses. A father identity is especially influential when it has high levels of perceived salience and commitments bolstering the identity (Pasley, Petren, & Fish, 2014; Pragg & Knoester, 2017; Stryker, 1968). Thus, fathering commitments and attitudes help shape the nature and salience of father identities. As such, men's commitments to, and attitudes about, fathering may influence their decisions about paternity leave and their level of father involvement.

First, men who are committed to fathering and who demonstrate this commitment through behavior such as prenatal involvement may embrace the opportunity to take paternity leave, and longer periods of leave, in order to fulfill their own expectations and yearnings for their identities as fathers (Hofferth et al., 2013; Pasley et al., 2014; Pragg & Knoester, 2017). Indeed, there is evidence supporting this idea (Duvander, 2014; Pragg & Knoester, 2017). Fathering commitments may also increase the likelihood that men become more involved fathers (Goldberg, 2015; Hofferth et al., 2013; Pragg & Knoester, 2017; Rane & McBride, 2000). Thus, characteristics related to father identities (i.e., fathering commitments) may lead a selective group of fathers to take paternity leave and longer periods of leave. Therefore, we expect that:

*Hypothesis 3:* Fathering commitments and attitudes (measured as prenatal involvement) will be associated with father engagement, but will not fully explain the relationships between paternity leave and father engagement.

Nonetheless, fathering commitments and attitudes may also be shaped by paternity leave experiences and thus work to explain the associations between paternity leave and subsequent father involvement. By having time off of work, fathers may have more opportunities to

experience, practice, and become confident in father involvement activities, likely increasing the salience of father identities and influencing fathering commitments and attitudes (Pasley et al., 2014; Pragg & Knoester, 2017; Rane & McBride, 2000; Stryker, 1968). Consequently, paternity leave-taking may encourage positive father attitudes that lead to higher levels of father involvement. For example, leave-taking may prompt fathers to develop confidence in themselves as parents, come to appreciate the importance of father involvement, and become less likely to feel that caregiving should be left solely to mothers (Pragg & Knoester, 2017; Rehel, 2014). In turn, the development of more positive attitudes towards fathering may also help to facilitate greater father involvement (Goldberg, 2015; Hofferth et al., 2013; Pragg & Knoester, 2017). Thus, we expect that:

*Hypothesis 4.* The relationships between paternity leave and father engagement will be partially explained by father attitudes following the child's birth.

#### *Other Factors*

A number of other factors may constrain decisions about, and abilities to take, paternity leave. It is important to account for these in an attempt to fully assess whether paternity leave may be related to father engagement or if this relationship is due to selection.

Most notably, socioeconomic status may shape the opportunities and barriers that men encounter when considering taking paternity leave and being involved in their child's life such that fathers with higher SES will have greater access to leave, be more likely to take paternity leave, and take longer periods of leave than fathers with lower SES (Brandth & Kvande, 2002; Huerta et al., 2014; Nepomnyaschy & Waldfogel, 2007). Most workplaces do not offer paid paternity leave to employees, and such policies are even rarer in low-income and low prestige

occupations (Melamed, 2014; SHRM, 2015). Moreover, low-income fathers are less likely to be able to afford taking unpaid leave compared to fathers with higher SES.

Furthermore, leave-taking is often stigmatized (Marsiglio & Roy, 2012), and men who request leave receive lower performance ratings, are viewed as inferior workers, and may earn less income in the future (Coltrane et al., 2013; Rege & Solli, 2013). These penalties appear to be more commonly applied to racial/ethnic minorities and low-SES workers (Rudman & Mescher, 2013; Williams, Blair-Loy, & Berdahl, 2013). Thus, white fathers and fathers with higher SES may be better able to avoid the stigmas associated with taking leave.

Finally, contextual factors that include other father, child, and mother characteristics may also affect leave-taking patterns and trajectories of father engagement. For example, religious organizations often emphasize the importance of family life (Petts, 2007; Wilcox, 2004). As such, religious involvement may encourage fathers to take paternity leave and become engaged fathers (Petts 2007; Wilcox, 2004). Yet, religiosity is also associated with traditional gender role attitudes, which may reduce the likelihood of paternity leave-taking and father involvement (DeMaris et al., 2011). Moreover, we incorporate father's age, child's age, gender, and low birth weight status as control variables in our analysis. We also consider relationship status, family size, length of maternity leave, mother's employment activities, and regional variations in order to account for different policy and socio-cultural contexts for leave-taking and father engagement (Nepomnyaschy & Waldfogel, 2007; Pragg & Knoester, 2017).

## DATA AND METHODS

### *Data*

Data for this study comes from the Early Childhood Longitudinal Study, Birth Cohort (ECLS-B). The ECLS-B contains a nationally representative sample of children born in the U.S.

in 2001. Information was collected from parents when their children were approximately 9 months (W1), 2 years (W2), 4 years (W3), and 5 years old (W4). Data from W1-W3 are used for this study as these are the only waves that contain information about father engagement (the resident father questionnaire was not used in W4). The sample is restricted to families in which mothers and fathers reside together at W1, fathers completed the resident father questionnaire (to have access to the questions of interest for this study), fathers were employed at the time of the child's birth and at W1, and mothers answered the questions on paternity leave. Twin siblings were also excluded from the sample; one randomly chosen twin from each family was used as the focal child. These restrictions result in a sample size of 5,000 resident father families for analyses examining father engagement at W1. For longitudinal analyses of father engagement, the sample is further constrained to families in which mothers and fathers completed their questionnaires in W1, W2, and W3 (N = 3,100).

#### *Paternity Leave*

Mothers reported on whether fathers took any time off for the birth of their child and how many weeks off (paid or unpaid) fathers took in the W1 survey. These questions are used to construct two indicators. *Paternity leave-taking* indicates whether fathers took leave (1 = yes). *Length of paternity leave* indicates the number of weeks of leave that fathers took (*no leave, less than one week, 1 week, 2 weeks, 3 weeks, 4 weeks, or 5 or more weeks*).

#### *Father Engagement*

Fathers were asked about their engagement with the focal child in W1-W3. Two indicators of father engagement are used. *Engagement in developmental activities* indicates how often (0 = *never/rarely* to 3 = *at least daily*) fathers talk or sing to child, read books, tell stories, play with child, and take child outside to walk or play ( $\alpha > .63$ ). *Caretaking* indicates how often

(0 = *never/rarely* to 3 = *at least daily*) fathers prepare meals, put child to sleep, dress, and bathe child ( $\alpha > .74$ ). For each indicator, items are summed and the mean is used as the scale score.

### *Fathering Commitments and Attitudes*

We include a number of variables to assess fathering commitments and attitudes at W1. First, we include an indicator of prenatal involvement to assess fathering commitments prior to the child's birth. Specifically, fathers were asked whether they participated in six activities: (a) discuss the pregnancy, (b) see an ultrasound, (c) listen to the baby's heartbeat, (d) feel the baby move, (e) attend birth class with the mother, or (f) buy things for the baby. To capture fathers that likely had a high level of commitment to being a father before the birth of their child (95% of fathers participated in at least 4 of these activities), this variable indicates whether fathers participated in all six of these activities prior to the child's birth (1 = *yes*).

Three additional variables reflect father attitudes after the child's birth. Perceived fathering competence is indicated by fathers' perceptions of themselves as fathers (ranging from 1 = *not very good at being a father* to 5 = *a very good father*). Traditional gender attitudes is a dichotomous variable indicating whether fathers agree (1 = *yes*) that it is more important for fathers to focus on providing while mothers care for the family; we consider fathers who endorse these attitudes to have less positive attitudes towards engaged fathering. Perceived importance of father involvement indicates fathers' agreement (1 = *strongly disagree* to 4 = *strongly agree*) to the following statements: (a) it is essential for the child's well-being that fathers spend time playing with children, (b) the way a father treats his baby has long-term effects on the child, (c) a father should be as heavily involved as the mother in the care of the child, and (d) fatherhood is a rewarding experience ( $\alpha = .59$ ). Items are summed and the mean is used as the indicator.

### *Control Variables*

A number of variables were included as controls. Controls for SES include income of both fathers and mothers (ranging from 0 = *less than \$10,000* to 8 = *\$100,000 or more*). Father's educational attainment is categorized as (a) did not complete high school, (b) completed high school (used as reference category), (c) some college, and (d) college degree. Father's hours worked is categorized as (a) part-time (less than 35 hours a week), (b) full-time (35-44 hours a week, used as reference category), and (c) more than full time (45 hours a week or more). Occupation type is categorized as (a) professional (used as reference category), (b) labor, (c) service, (d) sales, or (e) other occupational type. Mother's hours worked is categorized as (a) does not work, (b) part-time (less than 35 hours a week), and (c) full-time (35 hours a week or more, used as reference category). Race/ethnicity is coded as (a) White (used as reference category), (b) Black, (c) Latino, or (d) other race/ethnicity.

Other control variables taken from W1 include father's age, child's age, child's gender (1 = *male*), child's low birth weight, urban residence, region of country (northeast, midwest, south, or west, with northeast used as the reference category), length of maternity leave (in months), number of other children, whether the focal child is father's first child (1 = *yes*), relationship status (1 = *cohabiting*, with married used as the reference category), and religious participation (ranging from 0 = *never or almost never* to 3 = *once a week or more*).

We also incorporate time-varying variables into the longitudinal analyses. These variables are coded as previously described, but are taken from W1-W3 and allowed to vary over these waves. Time-varying variables include father's education, income, hours worked (including an additional category of not working for fathers who become unemployed in W2 or W3), occupation type, age, relationship status (although all fathers were married or cohabiting at

W1, fathers may separate, divorce, or marry at W2 or W3 as long as they remain a resident father), number of children, mother's hours worked, mother's income, child age, and region.

### *Analytic Strategy*

Ordinary least squares (OLS) and multilevel (i.e., growth curve) models are used for our main analyses. First, OLS models are used to analyze whether paternity leave-taking and length of paternity leave are associated with father engagement at W1. We estimate four models in an attempt to better isolate and explain the associations between paternity leave and father engagement: (a) bivariate relationship, (b) add control variables, (c) add prenatal involvement, and (d) add father attitudes after birth. In part, this approach is used because of the endogeneity concerns stemming from the first wave of data being collected at nine months after birth. Time-ordering concerns are particularly heightened for our measures of father attitudes, because attitudes are likely reciprocally related to both leave-taking and father engagement (Pragg & Knoester, 2017). Nevertheless, formal tests of mediation to assess whether father attitudes may explain the association between paternity leave and father involvement were also conducted using the bootstrapping method. Bootstrapping is a method to assess mediation in which estimates of indirect effects are obtained through repeated resamples from the data, and is appropriate when multiple mediators are used (Preacher & Hayes, 2008). Analyses were run using 5,000 bootstrap samples for each dependent variable, and significant mediating effects were determined using 95% bias-corrected confidence intervals. Because the ECLS-B does not contain indicators of father attitudes prior to the child's birth (and leave-taking), the mediation analyses are primarily used to isolate the association between paternity leave and engagement by providing a conservative estimate of this relationship (by accounting for father attitudes).

Second, multilevel (or growth curve) models are used to analyze the implications of paternity leave-taking and length of paternity leave for longitudinal patterns of father engagement from W1-W3. These models allow for an assessment of trajectories of father engagement over time, and account for the lack of independence and clustering in longitudinal data due to repeated measurements over time (level 1) nested within individuals (level 2) (Raudenbush and Bryk 2002). Unconditional growth models (i.e., models without any predictor variables) were first examined to determine the shape of the growth curve trajectories. For each indicator of father engagement, a quadratic model was the best fitting model (linear and cubic models were also tested). Months after birth was used as the indicator of time and rescaled so that 0 is used to estimate the intercept (0 for W1, 15 for W2, and 39 for W3). A random effect term for months after birth was also included in all models (tests for additional random effects and slopes did not improve the fit of the models). All continuous variables were mean centered.

Similar to the W1 analyses, four models (i.e., bivariate, add controls, add prenatal involvement, add father attitudes) are estimated for each indicator of father engagement. Time-invariant control variables are taken from W1 (i.e., race/ethnicity, child gender, low birth weight, fathering commitment and attitudes, and length of maternity leave). Time-varying control variables are taken from each wave to allow these to vary over time (i.e., father's education, father's income, father's hours worked, occupation type, religious participation, family structure, number of children, mother's income, mother's hours worked, reside in urban area, and region). Multiple imputation from five imputed models is used to account for missing data in all analyses.

### *Selection*

In addition to the main analyses, we employed propensity score matching, augmented inverse propensity weighted estimators, and Heckman (1979) techniques in sensitivity analyses



in order to gauge whether the results seem to be a function of selection or attrition processes.

Propensity score matching (PSM) was used to assess whether the influence of paternity leave-taking on father engagement is due to selection. PSM models attempt to approximate an experiment involving randomization in which groups are matched on a variety of observed covariates (Rosenbaum & Rubin, 1983). If the matching is successful and the assumptions of PSM are met, then the only difference between the matched groups should be whether or not they received the treatment (i.e., took paternity leave). To estimate propensity scores, we first considered variables that were measured at W1 and were likely unchanged between the child's birth and W1. Thus, we excluded variables for length of maternity leave, father attitudes, mothers' hours worked, and mothers' income, and included a variable for whether mothers worked prior to the child's birth (in supplemental models we included length of maternity leave as a possible selection factor if parents make decisions about leave together, but results were unchanged). We then ran a logistic regression model using the remaining W1 control variables to match fathers in the treatment (took leave) and control (did not take leave) groups and generated propensity scores for each observation (i.e., the probability of taking leave), and cases with the closest propensity scores were matched. We then visually and analytically assessed whether the assumption for common support was met (i.e., that propensity scores overlap between the treatment and control groups), and omitted cases in which the common support assumption was not met. We then assessed whether balance was achieved in each model (i.e., covariates did not differ statistically between the treatment and control groups), and pre- and post-tests suggest that balance was achieved. Finally, the propensity scores and covariates were used to estimate average treatment effects on the treated for each indicator of father engagement.

We utilized augmented inverse propensity weighted (AIPW) estimators to provide evidence of whether the potential influence of length of paternity leave on father engagement is due to selection. Similar to PSM, this approach estimates average treatment effects accounting for observed covariates that may select people into certain treatments (i.e., lengths of paternity leave), yet differs from PSM in that AIPW estimators can be used when there are multiple treatments (Cattaneo, 2010). To utilize AIPW estimators, we first collapsed length of paternity leave into categories (no leave, less than a week, 1 week, and more than 2 weeks). Results using the full range of leave length (no leave to 5 or more weeks) were similar in supplementary models, and are thus condensed here to conserve space. We then followed a similar process as detailed previously for PSM. Similar to PSM, diagnostic analyses suggest that the main assumptions needed to utilize AIPW estimators were met, and the same variables used for PSM were included in models that simultaneously predict length of paternity leave and indicators of father engagement to estimate the average treatment effects of length of paternity leave.

Finally, we considered whether the results may be due to attrition bias. Specifically, 25% of resident fathers did not complete the resident father questionnaire (which contains the questions on father involvement and father attitudes), and 38% of the W1 sample experienced attrition by W3. Fathers who completed the resident father questionnaire were more likely to take leave (88% vs. 84%), but did not differ in length of leave compared to fathers who did not complete the questionnaire. Fathers who left the sample between W1-W3 had lower SES, on average, than fathers who remained in the sample. To account for attrition bias, Heckman's (1979) two-stage method was used in sensitivity analyses. Because the Heckman procedure did not change the results, we present our findings without the Heckman procedure applied.

## RESULTS

Summary statistics for all variables at W1 are reported in Table 1, and separate mean values are reported for fathers who took paternity leave and those who did not. The vast majority of fathers (88%) took paternity leave, but took only 1.53 weeks, on average. Fathers who took leave were more engaged in developmental activities and caretaking than fathers who did not take leave. They also reported higher levels of prenatal involvement and attitudes that prioritize father involvement. Fathers who took leave were also more likely to be higher SES, married, religious, white, and have a partner who took a longer maternity leave.

----- Insert Table 1 About Here -----

As shown in Table 2, we first examined the extent to which paternity leave-taking is associated with father engagement at W1. In Model 1, the bivariate results indicated that paternity leave-taking is significantly associated with more frequent engagement in developmental activities ( $b = .07, p < .001$ ) and caretaking ( $b = .08, p < .05$ ). These results largely persisted after accounting for control variables (Model 2) and prenatal involvement (Model 3). However, paternity leave-taking was no longer significantly related to engagement in developmental activities after father attitudes were included in Model 4, and father attitudes partially explained the relationship between paternity leave-taking and caretaking (although the coefficient for paternity leave-taking remains significant). Results from bootstrap models suggested that 25% of the relationship between paternity leave-taking and engagement in developmental tasks, and 33% of the relationship between paternity leave-taking and caretaking, was mediated by attitudes about the importance of father involvement (results not shown). Surprisingly, there is also evidence that traditional gender attitudes are positively associated with engagement in developmental activities ( $b = .06, p < .05$ ) and caretaking ( $b = .09, p < .05$ ). However, this is only the case after controlling for positive father attitudes. It may be that

traditional attitudes and commitments to paid work can encourage positive father involvement, as well (Townsend, 2002; Wilcox, 2004). Regardless, traditional gender attitudes do not appear to explain the relationship between paternity leave-taking and father involvement. Overall, we generally found some support for the first and fourth hypotheses.

----- Insert Table 2 About Here -----

Results examining whether length of paternity leave is associated with father engagement at W1 are presented in Table 3. In Model 1, the bivariate results indicated that length of paternity leave is associated with more frequent engagement in developmental activities ( $b = .04, p < .001$ ) and caretaking ( $b = .05, p < .001$ ), as expected. The positive associations between length of paternity leave and engagement in developmental activities and caretaking remained significant after accounting for control variables (Model 2), prenatal involvement (Model 3), and father attitudes (Model 4). Also consistent with our expectations, results from bootstrap models (results not shown) suggested that attitudes about the importance of father involvement partially explained the relationships between length of paternity leave and engagement in developmental activities (25% mediated) and caretaking (33% mediated).

----- Insert Table 3 About Here -----

We next analyzed the extent to which paternity leave is associated with trajectories of father engagement over the first few years of a child's life. In these models, initial status indicates the average level of engagement at the W1 interview (e.g., the baseline level of engagement in developmental activities is 1.54, as shown in Model 1 of Table 4), and the variables listed under initial status indicate relationships with this baseline level of engagement. Linear and quadratic rate of change indicate the degree to which the trajectory changes over time (e.g., the trajectory of engagement in developmental activities increases from W1-W2, and then

decreases from W2-W3), and the variables listed under rate of change indicate relationships with the linear changes (no variables were related to quadratic rate of change).

----- Insert Table 4 About Here -----

Results from models assessing the extent to which paternity leave-taking was associated with trajectories of father engagement are presented in Table 4. In contrast to previous research, results suggested that engagement in developmental activities increased between infancy and age 2, but then declined between ages 2 and 4. However, consistent with Hypothesis 1 (as shown in Model 1), paternity leave-taking ( $b = .08, p < .05$ ) was positively associated with a higher initial level of engagement in developmental activities. The linear slope coefficient for paternity leave-taking was not statistically significant, suggesting that fathers who took paternity leave engaged in developmental activities more frequently than fathers who did not take leave when children are infants, and this higher level of engagement in developmental activities for fathers who took paternity leave persisted over time. The higher initial level of engagement in developmental activities remained after control variables were introduced (Model 2). However, the coefficient for paternity leave-taking lost statistical significance after considering prenatal involvement (Model 3), which suggests that prenatal involvement may be partially driving the association between paternity leave-taking and engagement in developmental activities.

Yet, the paternity leave-taking coefficient became significant again after accounting for father attitudes (Model 4 of Table 4). Thus, although paternity leave-taking was not significantly related to engagement in developmental activities at W2, it was positively associated with father's engagement in development activities from W1-W3, at equal levels of father commitments and attitudes (this discrepancy appears to be due to the different sample sizes used in each model as well as differences in variance between OLS and multilevel models). Predicted

means of engagement in developmental activities, taken from Model 4, suggest that fathers who took paternity leave engaged in developmental activities approximately 4% more frequently (1/10 SD) over the first few years of their child's life than fathers who did not take leave. This effect size was modest, but significant. In contrast, trajectories of caretaking were relatively flat (neither the linear nor quadratic rate of change is statistically significant) and paternity leave-taking was unrelated to trajectories of caretaking. Thus, there was modest evidence that paternity leave-taking is associated with father engagement.

----- Insert Table 5 About Here -----

Results assessing whether length of paternity leave was associated with trajectories of father engagement are presented in Table 5. Bivariate results (Model 1) suggested that length of paternity leave was associated with higher initial levels of engagement in developmental tasks ( $b = .05, p < .001$ ) and caretaking ( $b = .04, p < .001$ ). These significant relationships persisted when other variables were included (Models 2-4). Consistent with the second hypothesis, longer periods of paternity leave were associated with more frequent engagement when children were infants, and this higher level of engagement (relative to fathers who take shorter periods of leave or no leave) persisted throughout the first few years of a child's life (although the trajectories of caretaking illustrated in Figure 1 hint at a slight increase in involvement for fathers who took no leave or a short leave, the slope coefficients were not significant; thus, the results indicated that trajectories of caretaking are flat, regardless of length of paternity leave).

Results from bootstrap models (results not shown) suggested that attitudes about fathering competence and the importance of father involvement partially mediated the relationship between length of paternity leave and trajectories of developmental activities (25% mediated) and caretaking (33% mediated). Thus, there was some support for our expectations

that length of paternity leave would be positively associated with trajectories of father engagement and that fathering attitudes would partially explain this relationship. However, the effect sizes seem to be small. Predicted means of father involvement, drawn from Model 4 estimates, indicate that fathers who took four weeks of leave engaged in developmental tasks approximately 7% more frequently (1/5 SD) from W1-W3 than fathers who did not take leave. Similarly, fathers who took four weeks of leave engaged in caretaking approximately 4% more frequently (1/10 SD) from W1-W3 than fathers who did not take leave. These trajectories are illustrated in Figure 1.

----- Insert Figure 1 About Here -----

Finally, we compare OLS and multilevel model results with corresponding results from comparable models (with similar sample sizes) that use propensity score matching and augmented inverse propensity weighted estimators, in Table 6. Because our focus is on the extent to which the relationships between paternity leave and father engagement are a function of selection effects, the OLS and multilevel coefficients that are used for these comparisons are taken from Model 3 of Tables 2-5, as they contain the full set of control variables and prenatal involvement (the use of father attitudes measured nine months post-birth is inappropriate for selection into leave analyses).

----- Insert Table 6 About Here -----

As shown in the W1 selection model results in Table 6, the previously significant associations between paternity leave-taking and developmental activities and caretaking in the OLS models seem to be due to selection. In contrast, the positive associations between length of paternity leave and these aspects of involvement persisted when AIPW estimators were used, as indicated by the significant coefficients in the W1 selection model results. The coefficients

suggest that fathers who took at least two weeks of leave engaged in developmental tasks approximately 4% more frequently and caretaking approximately 7% more frequently when children are infants compared to fathers who did not take leave.

As shown in the W1-W3 selection model results from Table 6, PSM models suggest that paternity leave-taking was associated with more frequent engagement in developmental activities from W1-W3 once selection factors are more fully considered ( $b = .07, p < .001$ ). That is, paternity leave-taking was associated with more frequent engagement in developmental activities when children were infants, and this higher level of engagement persisted over time (i.e., the slope coefficient, as shown in Table 4, was not significant).

Also, the AIPW results reinforced the evidence of significant associations between length of paternity leave and trajectories of father's engagement in both developmental activities and caretaking. That is, longer periods of leave were associated with more frequent engagement in developmental activities and caretaking when children were infants, and these higher levels of engagement persisted over time (i.e., the slope coefficients, shown in Table 5, were not significant). Specifically, fathers who took at least two weeks of leave engaged in developmental tasks and caretaking approximately 7% more frequently over the first few years of their child's life than fathers who did not take leave.

Overall, once indirect relationships and selection effects are accounted for, results suggest that fathers who take paternity leave engage in developmental activities more frequently throughout the first few years of their child's life than fathers who do not take paternity leave. Longer periods of leave are also associated with more frequent engagement in developmental activities and caretaking when children are infants as well as over the first few years of their life.

## CONCLUSION



The goal of this study was to analyze the relationships between paternity leave and two indicators of father engagement over the first few years of a child's life. We focused on four hypotheses and highlight a number of findings below.

First, we found limited support for the hypothesis that paternity leave-taking per se leads fathers to be more engaged in their children's lives. After including control variables, accounting for selection into paternity leave-taking, and accounting for father attitudes, leave-taking was associated with trajectories of more frequent engagement in developmental tasks. Thus, paternity leave-taking may serve to enhance normative fathering behavior. Developmental tasks such as playing and reading to children are activities that fathers have been more engaged in compared to caretaking (Bianchi et al., 2006; Pleck, 2010). It may be that paternity leave-taking provides fathers with a short period of time that allows them to become familiar with parenting and more comfortable fulfilling the culturally normative roles of fathering in the U.S.

The lack of a significant relationship between paternity leave-taking and father engagement, in some instances (i.e., developmental activities at W1 and caretaking), may be due to a few factors. First, associations between paternity leave-taking and father engagement were largely due to selection, as shown in the propensity score matching models. Indeed, decisions to take paternity leave may be strongly affected by fathers' access to paternity leave programs. Relatively few fathers have access to such programs, and access to these programs is highly dependent on SES, suggesting that any benefits of taking leave may be attributed to pre-existing characteristics (Huerta et al., 2014; Melamed, 2014; SHRM, 2015). Thus, it may be challenging to fully assess the consequences of paternity leave-taking given the piecemeal structure of paternity leave in the U.S. Second, there is little variation in leave-taking in this sample; 88% of fathers took leave, which limits the potential differences that can be assessed between fathers

who did, and did not, take leave. Given the high rate of leave-taking, it is likely that most fathers took other forms of leave (vacation days, sick days, etc.). Moreover, this study draws on a sample of relatively advantaged families (on average, fathers are college educated, have incomes over \$40,000, and 87% are married), which may help to explain the high rate of leave-taking and evidence of selection effects. Although more research on paternity leave-taking is needed, results from this study do provide some evidence that granting fathers access to leave may encourage them to be more engaged in developmental activities during the early years of their child's life.

Second, we found results that consistently showed that longer periods of paternity leave are associated with more frequent engagement in developmental tasks and caretaking when children were infants, and with trajectories of more frequent engagement in developmental tasks and caretaking during the first few years of a child's life. The opportunity to be home with children for an extended period of time after birth may allow fathers to develop father-child bonds, increasing the likelihood that fathers remain engaged in a child's life (Lamb, 2010; Rehel, 2014). Having a longer period of time off may also help fathers to learn parenting skills and gain confidence as a parent (Pragg & Knoester, 2017; Rehel, 2014).

These results suggest that simply providing access to leave may not be sufficient for encouraging father engagement. Instead, allowing fathers to take more extensive periods of time off may enable them to gain parenting experience that encourages greater involvement when children are infants, and also to maintain this higher level of engagement throughout the first few years of their child's life (Lamb, 2010; Rehel, 2014). Even if access to leave is limited and often restricted to more advantaged fathers, taking longer periods of leave is associated with more frequent engagement net of selection effects. However, effect sizes are small. For example, U.S. fathers spend an average of 7 hours a week on childcare (Parker & Livingston, 2017). Thus, a

7% increase in caretaking among fathers who take 4 weeks of leave would translate to an extra 30 minutes of childcare per week relative to fathers who do not take leave. Taking two weeks of leave would translate to an extra 8.5 minutes of childcare per week. While this may not seem like much, even incremental increases in childcare would go a long way in helping to reduce gender inequalities in domestic labor on a population level.

Finally, we find some evidence that father commitments and attitudes may shape the relationships between paternity leave and father engagement. As noted previously, much of the relationship between paternity leave-taking and father engagement appears to be due to selection. Although some of this selection is due to SES, there is also some evidence that prenatal involvement influences the likelihood that fathers take paternity leave and their subsequent engagement with their child. Given the changing expectations for fathers espoused by the new fatherhood ideal, it is likely that men who embrace this ideal seek out ways to live up to these expectations once they know they will be fathers (Marsiglio & Roy, 2012; Pasley et al., 2014; Pragg & Knoester, 2017). As such, men who are involved prior to the birth of a child are likely to remain highly involved once the child is born (Cabrera et al., 2008), and may also take paternity leave to be involved in the child's life from birth. Thus, continuing to encourage and accept fathers' abilities to be active, involved, and nurturing parents, and providing structural opportunities for fathers to enact these roles (such as paternity leave), may help to facilitate greater father involvement (and positive child outcomes) in the future (Marsiglio & Roy, 2012).

We also find evidence that father attitudes partially explain the relationship between length of paternity leave and father engagement. In particular, longer periods of paternity leave may increase the likelihood that fathers view father involvement as important for child development, view fatherhood as rewarding, and view themselves as more competent fathers.

Consistent with identity theory, fathers who have the opportunity to spend time with their newborn child may be more likely to feel they are serving an important, and perhaps even necessary, role in their child's life compared to fathers who do not have the opportunity to be home with their child for extended periods of time (Pasley et al., 2014; Rane & McBride, 2000; Rehel, 2014; Stryker, 1968). Not surprisingly, believing that father involvement is important for child development, and viewing oneself as a competent father consequently increases the likelihood that fathers are engaged in their children's lives. Thus, one potential benefit of increasing access to longer periods of paternity leave is that more fathers may be given the opportunity to experience the early stages of parenting, which may encourage men to develop more positive attitudes about fathering and be more involved throughout the first few years of their child's life (Goldberg, 2015; Hofferth et al., 2013; Pragg & Knoester, 2017).

There are some limitations to acknowledge in this study. First, there is a lack of information about what (if any) types of paternity leave programs fathers have access to. Fathers who take leave may be utilizing workplace parental leave programs (which may be paid or unpaid), taking time off through the Family and Medical Leave Act, or using other forms of leave (e.g., vacation or sick days). Unfortunately, fathers were not asked about the type of leave they took, and type of leave may encourage father engagement to differing degrees. For example, fathers on paid leave may feel less economic pressure to return to work than fathers on unpaid leave, and thus may be more focused on engaging in positive interactions with their child.

Second, this study does not account for possible selection effects due to unobserved factors (e.g., availability of paternity leave programs, family-friendly workplace, etc.). A number of strategies were used to account for selection effects due to observed characteristics including the inclusion of a robust set of control variables as well as utilizing propensity score matching

and augmented inverse propensity weighted estimators to account for selection due to prenatal involvement, SES, and other controls. However, it is still possible that there are unobserved factors that lead fathers to take longer leaves and have higher levels of engagement.

Third, although this study utilizes two indicators of father engagement, indicators of accessibility or responsibility are not included. In addition, the sample for this study is limited to resident fathers because mothers only reported information on leave-taking for fathers who resided with the focal child. Prenatal involvement is also the only proxy for fathering commitments or attitudes prior to the birth; having additional indicators of fathering commitments and attitudes before having a child would be helpful in more fully assessing whether these select fathers into taking leave and being more involved with their child.

Finally, because parents were first interviewed approximately nine months after the birth of their child, there are some time-order concerns. For example, although it is reasonable to assume that paternity leave and prenatal involvement occurred prior to father's reports of engagement and attitudes nine months post-birth, all measures were collected at the same time. In particular, there are likely reciprocal relationships between father attitudes and engagement as well as father attitudes and leave-taking. We ran sensitivity analyses with stricter time-order requirements (i.e., paternity leave occurs prior to W1, attitudes measured at W1, involvement measured at W2), and results are consistent with the models presented here, which suggests that the relationships between length of paternity leave and father engagement are partially mediated by father attitudes. We present the W1 results to demonstrate the short-term association between paternity leave and father involvement (as the longitudinal analyses assess the long-term implications), but these ancillary analyses provide additional support for the conclusions made

here. Future studies should continue to more fully assess possible reciprocal and mediating relationships between paternity leave, father involvement, and father attitudes.

Despite these limitations, this study provides important contributions. By utilizing longitudinal data and focusing on two indicators of father engagement, we advance our understanding of the relationship between paternity leave and father engagement in the U.S. Results highlight that longer periods of leave are associated with more frequent engagement in developmental activities and caregiving with infants, as well as during the first few years of children's lives. In addition, father attitudes partially explain the relationship between length of paternity leave and father engagement. Future research should build on this study to better understand whether and how paternity leave may provide benefits to families.

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PATERNITY LEAVE AND FATHER ENGAGEMENT 38

Table 1. Summary Statistics at W1

	<i>M</i> ( <i>did not take leave</i> )	<i>M</i> ( <i>took leave</i> )	<i>SD</i> ( <i>full sample</i> )	<i>Min</i>	<i>Max</i>	<i>Missing</i>
<u>Leave-taking and Father Engagement</u>						
Paternity Leave-Taking (% of sample)	0.12	0.88	-	0	1	0%
Length of Paternity Leave	0.00	1.53	1.21	0	5	0%
Developmental Activities	1.53	1.61**	0.61	0	3	4%
Caretaking	2.07	2.15*	0.74	0	3	4%
<u>Father Commitments and Attitudes</u>						
Prenatal Involvement	0.27	0.38***	-	0	1	2%
Fathering Competence	4.23	4.27	0.85	1	5	2%
Traditional Gender Attitudes	0.15	0.10***	-	0	1	3%
Importance of Father Involvement	3.67	3.72**	0.33	1	4	3%
<u>Controls</u>						
Less than High School	0.21	0.11***	-	0	1	0%
High School*	0.26	0.20**	-	0	1	0%
Some College	0.27	0.31	-	0	1	0%
College Degree	0.26	0.38***	-	0	1	0%
Works Part-Time	0.10	0.06***	-	0	1	4%
Works Full-Time <sup>a</sup>	0.44	0.44	-	0	1	4%
Works more than Full-Time	0.46	0.50	-	0	1	4%
Professional Occupation <sup>a</sup>	0.27	0.38***	-	0	1	2%
Labor Occupation	0.45	0.36***	-	0	1	2%
Sales Occupation	0.08	0.07	-	0	1	2%
Service Occupation	0.18	0.17	-	0	1	2%
Other Occupation	0.03	0.02	-	0	1	2%
Income	3.46	4.08	1.98	1	8	15%
Mother Does Not Work	0.48	0.48	-	0	1	0%
Mother Works Part-Time	0.17	0.20	-	0	1	0%
Mother Works Full-Time <sup>a</sup>	0.35	0.32	-	0	1	0%
Mother Income	1.83	1.94	1.45	1	8	3%
Cohabiting	0.20	0.12***	-	0	1	0%
First Child	0.34	0.38	-	0	1	2%
Number of Other Children	1.22	1.04	1.13	0	5	2%
Religious Participation	0.92	1.15***	1.22	0	3	2%
Age	32.13	32.43	6.58	17	66	0%
White <sup>a</sup>	0.47	0.58***	-	0	1	0%
Black	0.11	0.07**	-	0	1	0%
Latino	0.24	0.14***	-	0	1	0%
Other Race	0.18	0.21	-	0	1	0%
Child Age	10.45	10.37	1.78	6	22	2%
Child is Male	0.53	0.52	-	0	1	0%
Low Birth Weight	0.21	0.21	-	0	1	0%
Urban	0.71	0.74	-	0	1	0%
Northeast <sup>a</sup>	0.17	0.16	-	0	1	0%
Midwest	0.23	0.25	-	0	1	0%
South	0.36	0.33	-	0	1	0%
West	0.24	0.26	-	0	1	0%
Length of Maternity Leave	1.36	1.60**	2.10	0	12	

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N	600	4400	5000
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<sup>a</sup>Used as reference category

Significant differences determined by two-tailed *t*-tests (\**p* < .05. \*\**p* < .01. \*\*\**p* < .001)

Table 2. Results from OLS Models of the Association between Paternity Leave-Taking and Father Engagement at W1

Variable	Model 1 (Bivariate)		Model 2 (Adds Controls)		Model 3 (Adds Prenatal)		Model 4 (Adds Attitudes)	
	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>
<u>Developmental</u>								
<u>Activities</u>								
Paternity Leave-Taking	0.07	0.03***	0.06	0.03*	0.06	0.03*	0.04	0.03
<i>Father Commitments and Attitudes</i>								
Prenatal Involvement					0.15	0.02***	0.12	0.02***
Fathering Competence							0.13	0.01***
Traditional Gender Attitudes							0.06	0.03*
Importance of Father Involvement							0.36	0.03***
<i>R</i> <sup>2</sup>	0.00		0.06		0.08		0.15	
<u>Caretaking</u>								
Paternity Leave-Taking	0.08	0.03*	0.08	0.03*	0.07	0.03*	0.06	0.03*
<i>Father Commitments and Attitudes</i>								
Prenatal Involvement					0.16	0.02***	0.13	0.02***
Fathering Competence							0.12	0.01***
Traditional Gender Attitudes							0.09	0.03*
Importance of Father Involvement							0.46	0.03***
<i>R</i> <sup>2</sup>	0.00		0.08		0.09		0.15	

N = 5000. Models 2-4 include all control variables listed in the methods section.

\**p* < .05. \*\**p* < .01. \*\*\**p* < .001

Table 3. Results from OLS Models of the Association between Length of Paternity Leave and Father Engagement at W1

Variable	Model 1 (Bivariate)		Model 2 (Adds Controls)		Model 3 (Adds Prenatal)		Model 4 (Adds Attitudes)	
	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>
<u>Developmental Activities</u>								
Length of Paternity Leave	0.04	0.01***	0.03	0.01***	0.03	0.01***	0.02	0.01**
<i>Father Commitments and Attitudes</i>								
Prenatal Involvement					0.15	0.02***	0.12	0.02***
Fathering Competence							0.13	0.01***
Traditional Gender Attitudes							0.06	0.03*
Importance of Father Involvement							0.36	0.03***
<i>R</i> <sup>2</sup>	0.00		0.06		0.07		0.15	
<u>Caretaking</u>								
Length of Paternity Leave	0.05	0.01***	0.04	0.01***	0.04	0.01***	0.03	0.01***
<i>Father Commitments and Attitudes</i>								
Prenatal Involvement					0.15	0.02***	0.13	0.02***
Fathering Competence							0.11	0.01***
Traditional Gender Attitudes							0.09	0.04*
Importance of Father Involvement							0.45	0.03***
<i>R</i> <sup>2</sup>	0.00		0.08		0.09		0.16	

N = 5000. Models 2-4 include all control variables listed in the methods section.

\**p* < .05. \*\**p* < .01. \*\*\**p* < .001



Table 4. Results from Multilevel Models of the Association between Paternity Leave-Taking and Trajectories of Father Engagement

Variable	Model 1 (Bivariate)		Model 2 (Adds Controls)		Model 3 (Adds Prenatal)		Model 4 (Adds Attitudes)	
	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>
<u>Developmental Activities</u>								
<i>Initial Status</i>	1.54	0.03***	1.63	0.08***	1.59	0.08***	1.58	0.07***
Paternity Leave-Taking	0.08	0.04*	0.07	0.04*	0.06	0.04	0.07	0.03*
Prenatal Involvement					0.14	0.02***	0.12	0.02***
Fathering Competence							0.12	0.01***
Traditional Gender Attitudes							0.05	0.04
Importance of Father Involvement							0.32	0.03***
<i>Linear Rate of Change</i>	0.02	0.00***	0.01	0.00*	0.01	0.00*	0.01	0.00*
Paternity Leave-Taking	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Prenatal Involvement					0.00	0.00	0.00	0.00
Fathering Competence							-0.00	0.00*
Traditional Gender Attitudes							-0.00	0.00
Importance of Father Involvement							-0.00	0.00***
<i>Quadratic Rate of Change</i>	-0.00	0.00***	-0.00	0.00**	-0.00	0.00**	-0.00	0.00**
<i>Log-likelihood</i>	-6670		-5200		-5096		-4787	
<u>Caretaking</u>								
<i>Initial Status</i>	2.11	0.04***	2.16	0.09***	2.12	0.09***	2.12	0.09***
Paternity Leave-Taking	0.04	0.00	0.04	0.04	0.03	0.04	0.03	0.04
Prenatal Involvement					0.15	0.03***	0.13	0.02***
Fathering Competence							0.09	0.02***
Traditional Gender Attitudes							0.05	0.04
Importance of Father Involvement							0.43	0.04***
<i>Linear Rate of Change</i>	0.00	0.00	-0.00	0.01	-0.00	0.01	-0.00	0.01
Paternity Leave-Taking	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Prenatal Involvement					0.00	0.00	0.00	0.00
Fathering Competence							-0.00	0.00
Traditional Gender Attitudes							-0.00	0.00
Importance of Father Involvement							-0.00	0.00***
<i>Quadratic Rate of Change</i>	-0.00	0.00***	0.00	0.00	0.00	0.00	0.00	0.00
<i>Log-likelihood</i>	-8684		-6699		-6601		-6247	

N = 3100 (9300 person-years). Models 2-4 include all control variables listed in the methods section.

\**p* < .05. \*\**p* < .01. \*\*\**p* < .001

Table 5. Results from Multilevel Models of the Association between Length of Paternity Leave and Trajectories of Father Engagement

Variable	Model 1 (Bivariate)		Model 2 (Adds Controls)		Model 3 (Adds Prenatal)		Model 4 (Adds Attitudes)	
	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>
<u>Developmental Activities</u>								
<i>Initial Status</i>	1.54	0.02***	1.63	0.07***	1.60	0.06***	1.60	0.06***
Length of Paternity Leave	0.05	0.01***	0.04	0.01***	0.04	0.01***	0.03	0.01***
Prenatal Involvement					0.14	0.02***	0.12	0.02***
Fathering Competence							0.12	0.01***
Traditional Gender Attitudes							0.06	0.03
Importance of Father Involvement							0.32	0.03***
<i>Linear Rate of Change</i>	0.02	0.00***	0.01	0.00**	0.01	0.00**	0.01	0.00**
Length of Paternity Leave	-0.00	0.00	-0.00	0.00	-0.00	0.00	0.00	0.00
Prenatal Involvement					0.00	0.00	0.00	0.00
Fathering Competence							-0.00	0.00*
Traditional Gender Attitudes							-0.00	0.00
Importance of Father Involvement							-0.00	0.00***
<i>Quadratic Rate of Change</i>	-0.00	0.00***	-0.00	0.00***	-0.00	0.00***	-0.00	0.00***
<i>Log-likelihood</i>	-6655		-5192		-5087		-4781	
<u>Caretaking</u>								
<i>Initial Status</i>	2.09	0.02***	2.16	0.09***	2.11	0.09***	2.13	0.09***
Length of Paternity Leave	0.04	0.01***	0.03	0.01**	0.03	0.01**	0.02	0.01*
Prenatal Involvement					0.15	0.03***	0.12	0.02***
Fathering Competence							0.09	0.02***
Traditional Gender Attitudes							0.06	0.04
Importance of Father Involvement							0.42	0.04***
<i>Linear Rate of Change</i>	0.00	0.00**	0.00	0.01	0.00	0.01	0.00	0.01
Length of Paternity Leave	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00
Prenatal Involvement					0.00	0.00	0.00	0.00
Fathering Competence							-0.00	0.00
Traditional Gender Attitudes							-0.00	0.00
Importance of Father Involvement							-0.00	0.00***
<i>Quadratic Rate of Change</i>	-0.00	0.00***	0.00	0.00	0.00	0.00	0.00	0.00
<i>Log-likelihood</i>	-8678		-6693		-6596		-6245	

N = 3100 (9300 person-years). Models 2-4 include all control variables listed in the methods section.

\**p* < .05. \*\**p* < .01. \*\*\**p* < .001

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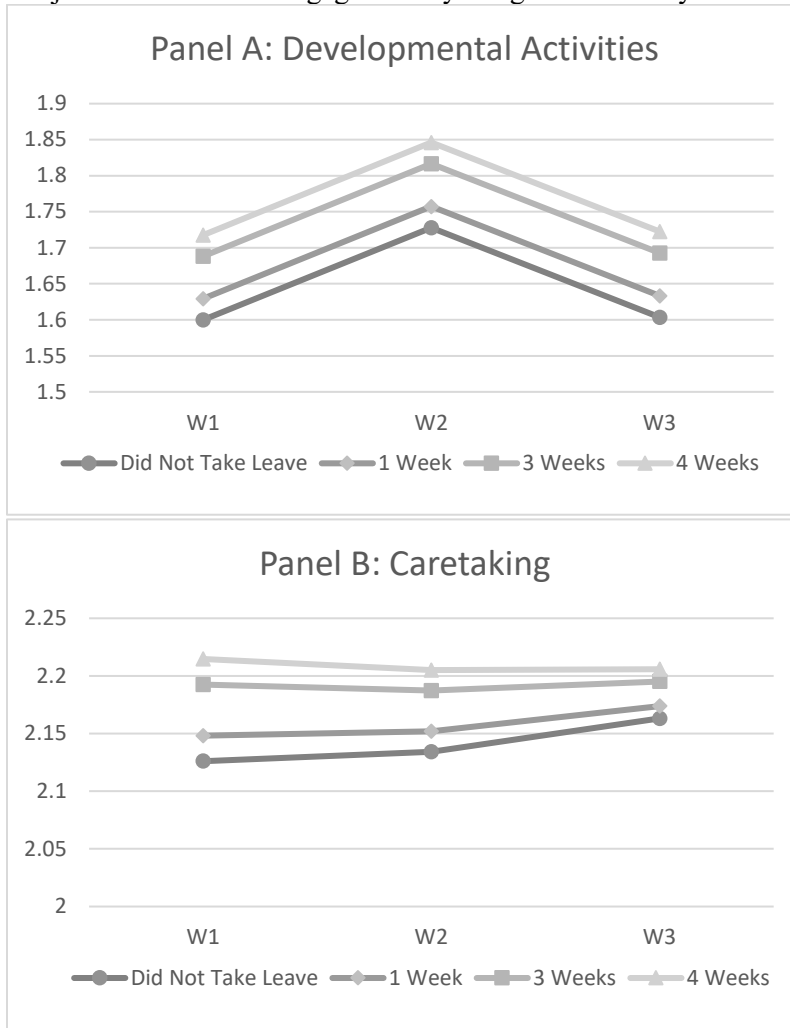
Table 6. Results Comparing W1 OLS and W1-W3 Multilevel Model Estimates of the Associations between Paternity Leave and Father Engagement to Selection Model Estimates

Variable	OLS Model (W1)		Selection Model (W1)		Multilevel Model (W1-W3)		Selection Model (W1-W3)	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
<u>Paternity Leave-Taking</u>								
Developmental Activities	0.06	0.03*	0.04	0.04	0.06	0.04	0.07	0.02***
Caretaking	0.07	0.03*	0.08	0.04	0.03	0.04	0.04	0.03
<u>Length of Paternity Leave</u>								
Developmental Activities	0.03	0.01***			0.04	0.01***		
1 week or less of leave			0.01	0.05			0.05	0.02*
2 weeks of leave			0.11	0.03**			0.11	0.02***
More than 2 weeks of leave			0.09	0.04*			0.12	0.03***
Caretaking	0.04	0.01**			0.03	0.01**		
1 week or less of leave			0.03	0.05			0.01	0.03
2 weeks of leave			0.15	0.04***			0.09	0.03**
More than 2 weeks of leave			0.14	0.04**			0.08	0.03*

OLS Model (W1) estimates are replicated from Model 3 of Table 2 and Table 3. Multilevel (W1-W3) estimates are replicated from Model 3 of Table 4 and Table 5. Propensity score models are used to estimate influence of paternity leave-taking, and augmented inverse propensity weighted estimates are used to estimate influence of length of paternity leave in selection models. For the multilevel models, only the coefficients for initial status (i.e., intercept) are shown, as the slope coefficients for paternity leave-taking and length of leave are not statistically significant.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$

Figure 1. Predicted Trajectories of Father Engagement by Length of Paternity Leave



The slope coefficients for trajectories of caretaking (Panel B) are not statistically significant. Thus, although it appears that fathers who took no leave or 1 week of leave increase their caretaking from W2-W3, these changes are not statistically significant. Results in Table 5 show that trajectories of caretaking are flat, regardless of length of paternity leave.