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# Gender Differences in Parental Leave Before and After the Introduction of a Paid Parental Leave Policy: A Sequence Analysis of Administrative Time-Keeping Records

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# Gender differences in response to a paid parental leave policy: A sequence analysis of administrative time-keeping records

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**Abstract**

Paid leave confers health benefits to new parents and their children, but the absence of a national paid family leave policy in the United States has left workers to navigate a patchwork of paid and unpaid parental leave benefits accessed through their employers. As public and private paid leave policies expand across the US, it is imperative to determine how these benefits impact leave taking behaviors among new parents. We use sequence and cluster analyses of administrative time-keeping records to detail parental leave-taking during the first 180 days after adding a child among employees of a large public-sector organization with a new paid parental leave policy. Results show that the additional paid leave benefits replaced some the unpaid leave women were taking and also lengthened their total leave duration. For men, who were only taking paid leave, the additional benefits allowed them to save their sick leave but left total leave duration unaffected. This study highlights the complex ways paid leave policies impact leave-taking among new parents. As more state and municipal governments consider paid family leave policies, understanding the interplay between these policies and existing organizational structures is critical to maximize the benefits across the workplace and limit unintended consequences.

*Keywords:* paid parental leave, workplace benefits, gender differences, public employers, sequence analysis

## 1. Introduction

An expanding body of evidence suggests that paid family leave provides health benefits to families by protecting employment benefits and income and securing time for this important family and personal transition (Aitken et al., 2015; Andres et al., 2016; Hewitt et al., 2017; Nandi et al., 2018). Paid family leave has also been linked to improvements in infant, child, and maternal health (Chatterji & Markowitz, 2012; Hamad et al., 2018; Pac et al., 2019; Rossin, 2011); increased participation in childrearing by fathers (Bartel et al., 2018; Bünning, 2015; Nepomnyaschy & Waldfogel, 2007); and increased labor force attachment among women (Baum & Ruhm, 2016). These benefits of paid parental leave have been examined primarily utilizing survey data which provide basic information on leave availability, but are not able to disentangle the various types of leave arrangements (e.g., parental leave, sick leave, vacation) that new parents must navigate. Moreover, the extent to which these policies reach heterogeneous workers (i.e., non-birth parents, racial and ethnic minorities, low-wage workers) and differentially affect their leave-taking trajectories remains unclear. We use sequence analysis of a unique source of administrative human resources data to identify and detail leave-taking trajectories among employees of a large organization, and how these vary by gender, before and after the implementation of a paid parental leave policy. Sequence analysis allows us to describe patterns in leave-taking arrangements over time for each individual leave-taker, and to examine how these patterns correlate with employee characteristics. Understanding these leave patterns will inform organizational and public policy decision makers about employees' leave preferences, and how these preferences may vary by gender, individual and job characteristics, and in response to policy change.

### *1.1. Study aim and research questions*

While a majority of workers in the U.S. are not covered by any paid family leave policy, most workers take some amount of leave after the birth of a child by combining unpaid time, sick,

vacation, and other paid time off (Laughlin, 2011). Paid parental leave policies–whether at the public or organizational level–interact with these policies to impact individuals' actual leave-taking behavior (i.e., leave trajectories), yet these have not been explicitly considered when examining the effects of paid leave policies on individuals. Whether policies originate in the public sphere and require compliance from organizations, or originate within organizations, paid leave policies will have differential effects on workers depending on their preferences and access to resources that enable utilization of leave.

The aim of our study is to understand how policy changes interact with the organizational context to affect leave-taking among workers. We examine how the introduction of a new paid parental leave policy changed both the duration and the types of leave taken by women and men[1] within a single, large organization using administrative time-keeping records. Our approach allows us to identify and describe distinct leave-taking trajectories to capture variation across workers in terms of demographic and job characteristics. The use of administrative time-keeping records reduces response bias and reporting errors, and focusing on a single organization eliminates variation in employer-provided benefits which are difficult to measure accurately. Specifically, we address the following research questions:

a) What are the different leave-taking trajectories in terms of type (sick, vacation, unpaid leave, paid parental leave), duration, and timing of leave for women and men in the year surrounding birth or placement of a new child?
b) How do these leave-taking trajectories change in response to the introduction of a paid parental leave policy?
c) What demographic and job characteristics predict membership in each leave-taking trajectory?

[1] Our analysis is based on binary gender, as defined in the organization's human resources records.

### *1.2. Policy context*

The United States is one of only two countries without any mandated paid leave for new mothers, and one of only two high-income countries without any paid leave for fathers (Raub et al., 2018). Outside the United States, access to extended periods of paid leave for new mothers and, in many cases, new fathers are commonplace (Raub et al., 2018). Of 34 OECD countries, 25 guarantee at least 6 months of paid leave for new mothers and 21 guarantee this amount for new fathers (Raub et al., 2018). The average duration of paid maternity leave available across OECD countries is just over 18 weeks (OECD, 2021).

In the United States, the Family and Medical Leave Act (FMLA), enacted in 1993, is the only federal leave law and mandates that employers with at least 50 employees within a 75-mile radius of all worksites provide up to 12 weeks of *unpaid*, job-protected leave to care for a new child, a seriously ill family member, or one's own serious illness. To be eligible for FMLA, one must have worked for their employer for at least 12 months before taking leave, and for at least 1,250 hours in the past 12 months. Taking these coverage and eligibility restrictions together, 59 percent of U.S. workers are eligible for job-protected unpaid leave through the FMLA (Klerman, 2012). To address these gaps in coverage and the lack of paid leave policies at the federal level, many state and local governments have enacted paid leave policies. Since California passed the nation's first paid family and medical leave law in 2002, ten other states (New Jersey, Rhode Island, New York, Washington, Massachusetts, Connecticut, Oregon, Colorado, Maryland, and Delaware) and the District of Columbia have passed similar paid family and medical leave legislation that provide between five (Rhode Island) and 24 (Maryland) weeks of leave, with wage replacement ranging from approximately 60-100% of usual wages. Moreover, more than 100 municipal governmental agencies in 31 states have implemented paid leave policies for their employees (National Partnership for Women & Families, 2020).

This policy landscape has led to most workers relying on their employers, rather than government programs, for paid leave, but merely 23 percent of all workers have access to paid family leave through their employers (U.S. Bureau of Labor Statistics & U.S. Department of Labor, 2021). The majority of working parents must piece together different types of leave (e.g., short-term disability, vacation, sick leave, unpaid leave) to attain their target leave duration without substantial income loss. Using U.S. census data from 1961 to 2008 to study employment and leave-taking among first-time mothers, Laughlin (2011) found that women used a variety of leave arrangements both before and after birth, including combinations of paid and unpaid leave, disability leave, and job changes (e.g., quitting job and becoming self-employed, in addition to being fired).

### *1.3. Methodological challenges studying impacts of paid leave*

There is substantial evidence that the expansion of paid parental leave has beneficial health and labor market impacts, particularly for mothers. However, the existing body of research suffers from several limitations that make it difficult to predict how paid leave policies actually affect leave-taking trajectories and subsequent outcomes among diverse U.S. workers. These limitations include: 1) little is known about how policies are differentially accessed across a population due to factors such as job role, gender dynamics, and socioeconomic status; 2) many studies lack the necessary data granularity to understand how individuals are actually piecing different forms of leave together; and 3) much less is known about the leave-taking patterns and subsequent health and labor market outcomes for non-birth parents, including fathers, and people who build their families through fostering and adoption.

Furthermore, parental leave research that applies survey data is limited in accurately capturing the different benefits (e.g., disability and vacation leave) that parents have to patch together to prolong their leave. Administrative datasets from human resources can illuminate how and when

parents use different leave-related mechanisms. We identified two published studies that use administrative data to examine parental leave among mothers and fathers. Examining claims for California's Paid Family Leave program from the state's Employment Development Department, Bana, Bedard, and Rossin-Slater (2018) found that the average parental leave duration for women was 12 weeks, while most men took between two and six weeks of leave. This study relies on claims made through the state programs, so does not capture additional leave that was taken as part of an employer-provided parental leave program. Another study, by Zhelyazkova and Ritschard (2017), examined social security records in Luxembourg for workers who added a child to their household in 2003. Importantly, like many other OECD countries, Luxembourg provides generous paid leave for new parents (46 weeks are available for new mothers and 28 weeks for new fathers) (OECD, 2021). The authors used sequence analysis to trace parents' employment and leave trajectories three years prior and five years after the birth of the child. The sequence analysis revealed higher uptake for parental leave among women than men, and lower rates of returning to work among mothers following parental leave. The authors concluded that childbirth is a clear "turning point" for female, but not male, trajectories. Zhelyazkova and Ritschard (2017) further argue that using sequence analysis to examine trajectories, rather than specific events, allows for a holistic approach that, while descriptive, captures the richness of qualitative data using a larger number of individuals.

### *1.4. Theoretical framework and hypotheses*

We draw upon two frameworks from the literature in developing our hypotheses. First, Andres and colleagues (2016) apply a health care access framework to the study of paid leave and its health implications. This framework, previously used to study access to health care (Aday & Andersen, 1974, 1981; Andersen, 1968), considers three indicators of access: 1) potential access, which focuses on enabling resources that increase the likelihood that leave utilization will occur; 2) realized access, which is the actual utilization of leave; and 3) access outcomes

(the downstream health effects of leave-taking). Based on their synthesis of a systematic literature review, Andres et al. (2016) identify several employment and personal indicators of potential access, including leave statute, position type (e.g., managerial), paid sick or personal leave available, job tenure, income, marital status, education, and race. Importantly, this framework recognizes that paid leave statute (i.e., being employed by an organization that offers paid leave or residing in a state with a paid leave law) does not necessarily translate into utilization, but rather is one of several indicators that span employment and personal domains. Instead, factors such as individual job characteristics, financial security, and workplace culture can facilitate or impede leave-taking.

Second, to further organize these multilevel indicators of potential access, we follow Barcus, Tigges, & Kim (2019) framework that considers the "individual, family, and workplace resources that either provide [parents] with the opportunity to take paid time off or make it feasible to take unpaid leave," with gender operating across each of these levels. This framework is particularly relevant to our study because it was developed to examine gender differences in the factors associated with parental leave-taking in the context of a single municipal employer – in their case, the City of Madison, Wisconsin – in order to inform the development of a paid parental leave policy. In this framework, individual characteristics consist of socioeconomic resources that may enable leave-taking through either economic or cultural capital, including financial resources, educational attainment, and race. Family context refers to inputs that influence leave-taking through financial means (e.g., the presence of another household earner) in addition to the supply of available caregivers. Barcus, Tigges, & Kim (2019) hypothesize that sole earners, whether because they are single parents or have a non-employed partner, will take shorter leaves. Together, these individual and family resources reinforce the individual indicators of potential access described by Andres et al. (2016). Finally, Barcus, Tigges, & Kim (2019) refer to workplace factors beyond paid leave policy availability itself that may influence

the use of these policies. Conceptually, this aligns with the employment indicators of potential access described by Andres et al. (2016), but their focus is more on the workplace culture (e.g., working in a department with a greater ratio of women or having a female supervisor) than individual job characteristics.

While Barcus, Tigges, & Kim (2019) were not able to capture the detailed, daily leave-taking data that we leverage from administrative data, their use of survey data enabled measurement of a richer set of socioeconomic characteristics, such as education, sexual orientation, whether they had a co-parent, and the employment status of their co-parent. Combining these theoretical frameworks allows us to examine the multilevel factors that influence the extent to which the introduction of a paid leave policy (an increase in potential access) translates into changes in leave utilization (realized access) and related work patterns.

#### *1.4.1. Workplace resources*

The introduction of a new paid leave policy represents an expansion in potential access to paid leave, but requires interaction with other available workplace resources in order to translate into realized access and improved outcomes. Even within organizations that offer paid leave, workplace culture exerts additional influence on workers' leave-taking. Workplace policies and practices shape the benefits workers have available to them (e.g., amount of sick/vacation time accrued, wait time for benefits eligibility) and workplace culture influences whether workers feel comfortable utilizing these benefits without negative repercussions. Expanding paid or job-protected leave allowance should increase leave-taking, all else being equal, and the empirical literature confirms that being offered job-protected and paid leave predicts actual leave-taking. Expansions in access to job-protected, unpaid leave through the FMLA had small but positive effects on the uptake and duration of leave among women (Han & Waldfogel, 2003) and increased leave-taking for fathers in the month after birth, particularly among more highly

educated men (Han et al., 2009). Several studies of new or expanded paid leave policies show increases in the average duration of leave taken among women (for a review, see (Rossin-Slater, 2017)) and men (Bartel et al., 2018; Baum & Ruhm, 2016), though none of the data sources used in these studies include information on actual leave duration and type of leave being used that our data feature.

Hypothesis 1: The introduction of a new paid parental leave policy will increase paid leave-taking.

*1.4.2. Individual and family characteristics*

Within an organizational setting, individual and family characteristics shape how a worker perceives the accessibility and suitability of available leave. We expect that characteristics that indicate a workers' social and economic status–such as income–will influence leave-taking, such that individuals with greater resources and standing will take longer leave. Job characteristics also influence the accessibility of leave. Specifically, when leave benefits are accrued based on job tenure (as sick and vacation time often are), longer-employed workers will on average have accrued more time to put toward their parental leave. Importantly, workers deplete these leave banks at different rates; workers who experience pregnancy and childbirth typically require sick leave for medical appointments and physical recovery, so birth- and non-birth parents with similar leave banks before a pregnancy would likely have vastly different amounts of leave to use for caregiving and bonding with a new child. Thus, job tenure, which influences accrued leave, will be particularly important for birth parents.

Hypothesis 2: Employees with higher income and longer job tenure will take longer leave.

Family characteristics like marital or partner status should influence a worker's financial ability to take leave, particularly if leave-taking results in a pay reduction. Studies of the unpaid FMLA have found the most pronounced effects on college-educated or married women who are most likely to be covered by the law and able to afford unpaid leave (Han et al., 2009). Public policy expansions in access to paid leave suggest that increases in leave-taking are largest among the least advantaged mothers (i.e., those who are unmarried, Black or Hispanic, or non-college-educated) who may not have had access to paid leave through their employers (Rossin-Slater et al., 2013). Other family characteristics, including other caregiving responsibilities and the presence of alternative caregivers, should also influence a worker's perceived need to take leave or, stated another way, their preferences for taking leave to care for a new child themselves versus returning to work and placing their child in the care of someone else. Individual and family characteristics are likely to additionally influence leave-taking through workplace norms and stigma. Black workers face discrimination in the U.S. labor market (Bertrand & Mullainathan, 2004) and may face greater penalties than white workers when requesting leave (Rudman & Mescher, 2013). We expect leave-taking to be positively correlated with being white, older, and in a managerial position because these workers may experience reduced fear of negative repercussions for taking leave, such as commitment penalties, wage penalties, negative performance evaluations, or being passed over for promotions. Our data do not allow us to examine other relevant family characteristics.

Hypothesis 3: Employees who are white, older, and in managerial positions will take longer leave.

### *1.4.3. Gender*

Based on prior research, we expect that employees identified as women will take longer parental leaves, and will be more likely to take leave all at once immediately around the birth of

a child, while those identified as men may take intermittent leave spread over several months. We anticipate these findings for two reasons. First, we use administrative data which, like most surveys, do not allow for the determination of whether an individual was the birth parent, so binary gender is used as a proxy for whether or not the individual experienced pregnancy and childbirth. Birth parents bear the physical, physiologic, and psychological challenges of carrying a pregnancy and giving birth and therefore require more time off for both medical appointments and physical recovery, and birth parents are most likely to be the parent responsible for breastfeeding (McGovern et al., 2007, 2011). While we expect most parent employees who are identified as women gave birth and most who are identified as men did not, this estimation may disproportionately exclude members of the LGBTQ+ community, especially parents who are transgender or non-binary. Second, gendered expectations influence the societal and workplace ideals that an individual is held to, with men often facing additional stigma around their desire to take parental leave (e.g., "flexibility stigma" or "commitment penalty") (Petts et al., 2018, 2022; Rudman & Mescher, 2013). Fathers, in particular, may be more strongly influenced by workplace norms that prevent them from taking long periods of leave (Goodman et al., 2019; Petts et al., 2018).

Hypothesis 4: Women will take longer leave than men.

## 2. Data and sample

### *2.1. Setting*

This study was conducted in partnership with Multnomah County, a public sector employer in Portland, Oregon with approximately 5,000 regular (i.e., non-temporary) employees annually. Multnomah County has 10 departments, serving in multiple areas including tax assessment and collection, human services, health, public safety, and libraries.

In October 2015, the Multnomah County Board of Commissioners, a five-member elected board that governs Multnomah County, passed a resolution to provide paid parental leave (PPL) for County employees. The PPL policy, which went into effect the following month, provides up to six weeks of continuous or intermittent fully paid leave that can be used within 12 months of the birth, adoption, or foster placement of a child. All full- and part-time employees become eligible after 180 days of employment. The PPL policy builds on a set of existing benefits; prior to the PPL policy, employees could use a combination of unpaid leave and accrued sick and vacation leave to care for new children. At the time the PPL policy went into effect, full-time County employees could accrue 12 sick days per year (with no maximal accrual) and, in most positions, began with 12 paid vacation days per year (increasing with years of service) (Goodman et al., 2019).

### *2.2. Data collection and measures*

We used administrative time-keeping records provided by the central human resources department to explore the leave patterns of employees before and after the policy was implemented, and to identify sub-groups within parent employees based on their leave behavior. Human resources records contained daily occurrences of leave-taking for all employees who added a child and were benefits-eligible between January 1, 2013 and December 31, 2017 (N=566). We identified employees who added a child during the study period using two strategies: (1) employees who took leave to care for a new child and reported it as such to human resources and (2) employees who added a new dependent child to their employer-sponsored health insurance plan and whose child's date of birth occurred during the study period. For employees who added more than one child during the study period, we use the first

child only and drop records for subsequent children. This study was approved by the [Blinded for Review] Institutional Review Board.

The leave period of the study includes 30 days before the child's birth, and 180 days after. We focus on this period because we anticipated and observed that the vast majority of leave-taking for both men and women occurs within this window. We excluded 73 employees who had incomplete records, and 51 employees who either had a child before their hiring date or who had a child in the period just before the policy was enacted and had their leave status retrospectively updated to a paid parental leave status (this update changed their available sick and vacation leave in the ensuing months and therefore does not reflect a typical scenario either before or after the policy was enacted). The final analytical sample consisted of 442 employees with complete data who added a child during the study period.

We used binary gender (male, female) and race/ethnicity (white, Black or African American, Hispanic/Latino, Asian, Native Hawaiian or Other Pacific Islander, Native American/Alaskan, or Two or More Races) as listed in the human resources records. Because of small sample sizes in some clusters, we combine the Asian, Native Hawaiian or Other Pacific Islander, Native American/Alaskan, and Two or More Races groups into a single group labeled "Combined groups not otherwise listed" for the cluster and regression analyses. We calculated age at the time of the child's birth (in years) as the difference between the employee's and their dependent's date of birth. Managers were identified as those who were listed as "management employees" under their bargaining unit and consists of employees who are in charge of a unit or a project and are supervising other employees. We identified full time work status (at least 40 hours per week) and annual salary from the year the dependent was born. Job tenure (in years) was calculated based on the difference between the employee's hire date and their dependent's

date of birth. See data transparency table (Appendix Table A1) for description of overlap with data in a previously published manuscript.

## 3. Empirical analysis

The empirical analysis of administrative leave records consisted of three steps: descriptive statistics and sequence analysis, cluster analysis based on sequences, and regression analysis to predict cluster membership. The sequence analysis, which is exploratory, allows us to identify leave patterns by converting the sequence data into interactive graphics. The descriptive statistics help us to summarize the demographic, job, and leave duration characteristics of our sample and to test if differences are found before and after the PPL policy was implemented for men and women. The cluster analysis identifies subgroups within the pre-PPL and post-PPL samples that share similar leave-taking trajectories. Finally, the regression analysis compares the clusters identified in the previous step using demographic and job characteristics. Because each of these analyses builds on results of the previous analysis, we present methods and results for each analysis in sequence.

### *3.1. Sequence analysis and descriptive statistics*

#### *3.1.1. Method*

For each employee in our sample, we received a record of the number of leave hours and the type of leave taken for each day that the employee was absent from work. Days with more than one type of leave recorded were entered into the dataset with the leave-type representing the highest number of hours for that day, and all days without any leave recorded were considered days “not on leave.” Because many employees work non-standard schedules (i.e., nights, weekends), we were unable to differentiate between work days and scheduled non-work days. After a comprehensive review of the data with the organization’s benefits manager who assisted us with the interpretation of each code, we excluded leave codes that were unlikely to have

been used for caregiving (e.g., leave for jury duty) and reclassified all relevant codes into five categories of leave: (1) sick leave, (2) vacation, (3) paid parental leave, (4) unpaid leave, or (5) another type of leave. “Another type of leave” includes holidays, worker’s compensation, administrative furlough, personal holiday, and paid and unpaid union time. The final data consisted of one leave code (or a code of “not on leave”) per day per employee. We linked employee records with other human resources files containing employee gender, date of birth, race/ethnicity, job title, department, union representation status, and salary to these time series.

To process the sequence data, we used the TraMineR package (Gabadinho et al., 2011) within the statistical software R 3.6.1 that allowed us to manage the large dataset, transforming it to other formats that later were represented in plots to visualize the leave patterns. We divided our sample according to whether the child was born before or after enactment of the paid parental leave policy and by employees’ gender as identified in the administrative records. Graphical outputs from the sequence analysis show the leave in chronological order for each employee with the type of leave specified by color. The visualization helps to identify the leave trajectories and changes in response to the policy.

Descriptive analyses examined the length of leave, demographics, and job characteristics testing for differences before and after the paid parental leave policy, by gender, using t-tests for continuous variables and chi-squared tests to assess independence between categorical variables.

### *3.1.2. Results*

Table 1 shows descriptive statistics for women and men who added a child in the study period and who had leave data available for at least six months following their new child’s data of birth,

stratified by whether the leave-taking occurred before vs. after the PPL policy went into effect (n=442). Employee age and race/ethnicity were similar in the pre- and post-PPL periods for both women and men. Overall, the annual salary was higher post-PPL for men and women, although in the top tier (between $100,000 and $150,000), only men show increases after PPL. Most employees worked full time, however, the percentage of women who worked full-time post-PPL was higher than the pre-PPL women sample (91% vs. 81%, respectively; $p<0.05$) and among men, the post-PPL sample reported lower percentage of full-time work than the pre-PPL sample (86% vs. 98%, respectively; $p<0.05$). With regards to tenure, there were statistically significant differences between men in the post-PPL period versus men in the pre-PPL sample (4.9 yrs. vs. 8.0 yrs., respectively; $p<0.01$). Lastly, the percentage of women who held a management position in the post-PPL period was higher than the pre-PPL period sample (14% vs. 7%, respectively; $p=0.06$).

Table 2 shows the duration of paid, unpaid, and total leave in the days before and after a child's date of birth for the pre- and post-PPL periods, stratified by gender. The duration of leave before the child's date of birth was less than one week for all groups and did not change significantly over time. For the leave after the child's date of birth among women, we observed statistically significant increases in paid leave pre-PPL vs. post-PPL (from 34.0 to 59.8 days, $p<0.01$) and decreases in unpaid leave (from 26.5 to 14.3 days, $p<0.01$), with an overall increase of 14 days of leave in the post-PPL period. For the leave after the child's date of birth among men, the changes were much smaller. Men increased their paid leave (from 31.3 to 38.4 days, $p<0.05$) and decreased their unpaid leave (from 3.2 to 0.2 days, $p<0.05$), with the overall leave duration staying relatively stable.

The results from the sequence analysis are represented in four graphs (Figure 1). These graphs build on Table 2 to show the sequence of different types of paid and unpaid leave in the 30 days

prior to and 180 days after a child's birthdate. Panel A shows the leave patterns for women before and after the PPL went into effect; panel B shows these patterns for men. The x-axis contains the days before and after the child's date of birth (vertical dotted red line that divides the sequence), and the y-axis represents the percentage of employees who reported leave on the specific day. The grey bars, representing the combination of all leave types, indicate that overall leave patterns did not change dramatically from the pre- to post-PPL time period for either men or women. However, the composition of leave did change noticeably. For women, the introduction of PPL (blue line) pushed sick leave (green line) to later weeks, and replaced much of the unpaid leave time (red line). For men, who were almost exclusively taking sick time in the pre-PPL period, PPL replaced a large percentage of this sick time rather than shifting it out to a later period, as it did for women.

According to Figure 1, only 70% of female employees were on leave the day their child was born. While we might expect this to be close to 100%, this is likely an artifact of our data. Our data only include days that a leave was recorded in the human resources records; not all workers were scheduled to be at work the day their child was born, for example if the birth occurred on a weekend or other scheduled non-work day.

### *3.2. Cluster analysis*

#### *3.2.1. Method*

To identify subgroups with similar sequence patterns within the pre-PPL and post-PPL period for women and men, we used the optimal match distances within the TraMineR package. The generated distance matrix shows the results of the minimal editing costs for transforming the sequences into each other. Consequently, we used the Cluster package to aggregate the data into agglomerative hierarchical clusters using the distance matrix. We used the dendrogram plot to diagram the hierarchical relationships between all sequences and display all generated

clusters. To find the adequate number of clusters for each sub-group we applied the “elbow method” which computes the intra-cluster variation for each possible total number of clusters (Ng, 2012). We selected the cluster number from the resulting plot that recommends the appropriate number of clusters where the intra-cluster variation is minimized. Lastly, we replicated our descriptive tables stratified by cluster and gender and tested for differences in the pre- vs. post-PPL periods using ANOVA for means comparisons and chi-squared tests for comparisons of categorical variables. To visually represent each cluster’s leave-taking trajectory, we identified a single exemplar from each cluster using TraMineR. The representative sequence plot displays a non-redundant set of representative sequences extracted from the main sequence object and sorted according to a representativeness criterion.

### *3.2.2. Results*

For women, across both the pre- and post-PPL time periods, we identified three clusters of leave-takers that varied in the amount of paid, unpaid, and total leave time before and after the child’s birthdate (Table 3).

In the pre-PPL period, the three clusters identified were: 1) long leave mostly paid; 2) short leave mostly paid; 3) and long leave mostly unpaid. The women in pre-PPL clusters differed primarily on tenure and salary. Women in the “long leave, mostly paid” cluster reported longer job tenure ($p<0.05$), and were more likely to earn between \$50,000 and \$100,000 ($p<0.05$) and less likely to earn less than \$50,000 ($p<0.05$) than the other clusters.

In the post-PPL period, the three resulting clusters for women were: long leave mostly paid; short leave mostly paid; and long leave, paid and unpaid. There were statistically significant differences between clusters in age, salary, job tenure, and the likelihood of being a manager. The “long leave, paid and unpaid” cluster was younger, did not contain any managers, and had

shorter job tenure than the other clusters ($p<0.05$). In contrast, the “long leave, mostly paid” cluster contained more managers (33%) and longer average job tenure than the other clusters “long leave, paid and unpaid” and “short leave, mostly paid” (5.9 years, 3.0 years, and 4.4 years, respectively). Finally, both the “long leave, mostly paid” and “long leave, paid and unpaid” clusters included a higher percentage of women who earned more than $100,000 (7% and 8%, respectively) than the cluster “short leave, mostly paid” (0%). Differences by race/ethnicity did not reach statistical significance.

For men, across the pre- and post-PPL time periods, we identified two clusters of leave-takers that differed in the amount of paid, unpaid, and total leave after a child’s birthdate: long leave and short leave (Table 4). There were no statistically significant differences in demographic or job characteristics between clusters in either the pre- or post-PPL periods.

Figure 2 shows the proportion of each group (women and men, pre- and post-PPL) that falls into each cluster, along with an exemplar trajectory for each cluster. These visual representations illustrate how leave trajectories vary according to type, duration, and timing of leave.

### *3.3. Regression analysis: characteristics of cluster members*

#### *3.3.1. Method*

Lastly, we examined the association between demographic and job characteristics and the likelihood of membership in each cluster, using the “long leave, mostly paid” cluster as the female referent and the “long leave” cluster as the male referent.

Multinomial logistic regression analyses were conducted using the package ‘glm’ binomial family from R 3.6.1. We first added demographic characteristics (race/ethnicity, age, and salary) and

508 then job characteristics (full- vs. part-time work, job tenure, and managerial status) to the
509 regression separately. Because of small sample sizes in some clusters, we combined Asian,
510 Native American, Native Hawaiian, and those reporting two or more races into a “Combined
511 groups not otherwise listed” category. We then incorporated both demographic and job
512 characteristics in the regression. Results were exponentiated to odds ratios for ease of
513 interpretation of the coefficients. We also tested and confirmed that all models met the
514 multinomial logistic regression assumptions of independence of observations and absence of
515 multicollinearity of independent variables.
516

517 *3.3.2. Results*

518 Table 5 shows results from the logistic regression models for women, stratified by pre- and post-
519 PPL (panels A and B, respectively). In the pre-PPL period, after adjusting for demographic and
520 job characteristics, there was a significant difference in the odds of reporting “short leave,
521 mostly paid” (relative to “long leave, mostly paid”) for Hispanic/Latina women compared to white
522 women (OR = 0.22; 95% CI: 0.05 - 0.81; $p<0.05$). Hispanic/Latina women were also three times
523 more likely to report “long leave, mostly unpaid” (relative to “long leave, mostly paid”) compared
524 to white women (OR = 3.25; 95% CI: 1.0 – 11.5; $p<0.10$).
525

526 In the post-PPL period, results show that an additional year of age among women is associated
527 with an increase in the odds of reporting a “short leave-mostly paid” after adjusting for
528 race/ethnicity, salary, and job characteristics (OR = 1.20; 95% CI:1.06–1.37; $p<0.01$).
529 Race/ethnicity was not significantly associated with leave type in the post-PPL period.
530

531 Among men in the pre- and post-PPL periods, demographic and job characteristics did not differ
532 significantly between clusters (Appendix Table A2).

## 4. Discussion

Using a novel data source of administrative time-keeping records from an organization that recently enacted a paid parental leave policy, our study paints a detailed picture of the patterns of leave-taking for women and men in the period around the birth of a child. Moreover, we examined how these patterns differ by demographic and employment characteristics, and how they were affected by the introduction of a paid parental leave policy. Given the trend towards expanded paid leave policies at the state and local level across the U.S., our findings are important for understanding how these policies interact with existing leave-related benefits at the organizational level. This is critical for predicting heterogeneous effects of paid leave policies and preventing unintended consequences such as leaving new parents returning to work without any sick leave. Moreover, having a deeper understanding of leave patterns can help employers support employees based on their preferences of leave.

Overall, new parent employees used a variety of strategies to take leave, but clear patterns emerged, partly due to organizational policies regarding the order in which each leave type has to be taken. For example, once the PPL policy took effect, employees were required to use this leave before using their sick leave. This explains our observation that PPL was used almost exclusively in the first six weeks for women, and mostly in the first six weeks for men (some men used this leave intermittently over a longer time period). Similarly, employees were required to exhaust all available paid leave before using unpaid leave, explaining the rightward skew of unpaid leave among women. Consistent with the policy being focused on caregiving rather than medical leave, we did not observe any change in the amount or type of leave taken before a child's birth. Future research should be conducted under other organizational policy constraints to see how these patterns change.

559 Using sequence analysis allowed us to identify clusters, or leave-taking patterns that were
560 similar to one another. This critical step allowed us to examine the different ways employees
561 within the same organization and subject to the same benefits structure their leave, and how
562 this changed in response to the policy. The differential leave-taking patterns likely reflect
563 multilevel factors—some of which we were able to examine and others we were not. Our results
564 suggest that the availability of paid leave was critically important. We found support for
565 Hypothesis 1 - leave increased overall after PPL was introduced. We found partial support for
566 Hypothesis 2 - job tenure predicted longer leave-taking, since accrued benefits like sick leave
567 and vacation were frequently the foundation of leave taken. However, income was not
568 significantly associated with leave duration. We found partial support for Hypothesis 3, that
569 race/ethnicity, age, and managerial status would impact leave duration. Older workers were
570 more likely to take longer, mostly paid leave than short, mostly paid leave compared to younger
571 workers, and Hispanic workers were more likely to take longer, unpaid leave and less likely to
572 take shorter, paid leave relative to their white counterparts. However, we did not observe
573 significant differences in leave duration across other non-Hispanic racial groups, nor by
574 managerial status. This could be due to small sample sizes for some subgroups (e.g., African-
575 Americans). This could also indicate that race/ethnicity, age, and managerial status are not
576 good proxies for fear of workplace penalties. Unfortunately, administrative data did not allow
577 examination of preferences and need for leave (e.g., recovery from birth, health of birth parent
578 and new baby, availability of acceptable and affordable childcare) or perceived risk of workplace
579 penalties for taking leave. However, focus groups conducted with the same employee
580 population confirm that these are important considerations (Richardson et al., 2019). We do not
581 know, for example, whether employees who took relatively short leaves did so because that
582 reflected their ideal leave duration, or because they felt they could not take longer take leave
583 (due to financial barriers or perceived workplace penalties). Future work should more formally

examine power dynamics within the workplace, as well as individual employee preferences for leave, to better understand leave-taking and response to paid leave policy.

Consistent with Hypothesis 4, women across the board took longer and more concentrated leave than men. Somewhat surprising, however, was the differential response to the PPL policy: the additional paid leave benefits replaced some of the unpaid leave women were taking, but also lengthened their total leave duration; for men, who were already only taking paid leave, the additional benefits took the place of sick leave but did not affect total leave duration. This is somewhat inconsistent with research showing that father quotas in national paid family leave policies (i.e., periods of leave that are non-transferable between parents) when combined with high wage replacement increase leave uptake among fathers (Karu & Tremblay, 2018). Given that Multnomah County's PPL policy provided fully paid, non-transferable benefits, one might expect to see a greater impact on leave duration. Although men's pay and leave duration were unchanged, the policy did allow them to retain their sick leave for use later on, which may have had benefits beyond the window of our study (i.e., to care for their new baby in the second half of the first year).

Our findings should be interpreted within the context of U.S. leave policies. Unlike most other high-income countries, the U.S. does not mandate paid leave for new parents (OECD, 2021). Instead, most workers rely on their employers to provide these benefits voluntarily. Oregon, where our study takes place, has recently become one of a small set of U.S. states to have passed a paid family leave law, though our study was conducted before the law was passed. When the state's policy goes into effect in 2023, it will provide a new leave type for workers to draw on. Future research should examine how leave-taking patterns will continue to change with the addition of state-level paid leave benefits. In other states with

609 paid family and medical leave policies, lack of awareness and limited uptake have
610 potentially limited the policies' impacts. This is quite different from the high awareness and
611 uptake that we observed with this organizational policy (Goodman et al., 2019). This could
612 be due to stronger pathways for communicating information about organizational policy
613 change to employees through email, flyers, and knowledgeable human resources
614 personnel. Furthermore, organizational policies may be perceived more positively than state
615 policies, and may result in more uptake, because they provide a signal to workers that the
616 organization is accepting and encouraging of leave (Begall et al., 2022; Connelly et al.,
617 2011; Kurtessis et al., 2017; Petts et al., 2022).
618
619 Our study focuses on the factors that contribute to parental leave-taking, but does not extend to
620 the important implications of this leave-taking for workers. A recent paper by Petts et al. (2022)
621 introduces the concept of a "commitment penalty" and finds that workers who take longer
622 parental leaves are perceived as less committed to their jobs. In their study, this penalty applied
623 equally to mothers and fathers, though mothers were perceived as less committed to their jobs
624 regardless of parental leave duration. Importantly in the context of our findings, they find that
625 supportive organizational policies increase perceptions of employee commitment, though do not
626 uncover evidence that this moderates the negative impact of taking longer parental leave. More
627 research is needed to better understand the policy design features that facilitate leave-taking
628 while limiting commitment and other penalties in the workplace.
629
630 This novel exploration of leave-taking patterns has limitations. We believe that the two methods
631 to identify employees with a new child (HR reporting and insurance coverage in the system)
632 include almost all employees who added a child during the study period; however, these
633 strategies would not capture parent employees who did not add their new child to their health

insurance and who did not take any leave that they identified to human resources as being for a new child (e.g., a parent who took two weeks of vacation that was not flagged as being FMLA-protected would not be included in our dataset, unless they added the child to their health insurance plan). While we expect this exclusion to be small, it would disproportionately exclude fathers and other non-birth parents. Administrative data do not include information on marital status, birth order, whether the new child was adopted, or whether the employee was the birth parent. While our sample includes almost all parent employees who added a child during the study period, focusing on one organization means our sample size is still relatively small in certain subgroups. Future research should attempt to replicate these results in larger, more diverse organizations or using administrative data across organizations. Moreover, the experiences of parents in diverse family structures – such as adoptive parents, foster parents, and parents who are members of the LGBTQ+ community – merit additional research attention.

Because human resources records include only leave-taking, we cannot distinguish among days when leave was *not* taken (i.e., working days are coded the same as scheduled non-work days, like weekends). This leads to mean leave duration estimates that only include the number of days of each type of leave actually taken and, for those who took concentrated leave, do not represent total number of weeks or months away from work. As the administrative data only include leave for the correspondent work day, we are not able to discern what workers were doing on days that they were not scheduled to be at work.

## Conclusion

We reveal patterns hidden in administrative datasets to illustrate the variable and nuanced ways in which the introduction of a paid parental leave policy impacts new parent employees' leave-taking trajectories. As more and more state and municipal governments consider paid leave policies, understanding the interplay between these policies and existing organizational

structures will be critical to maximize the benefits across the workplace and limit unintended consequences.

## Declarations

*Competing Interests:* The authors have no relevant financial or non-financial interests to disclose.

*Author Contributions:* All authors contributed to the study conception, design, and data collection. Data analysis were performed by JMG and LMD. The first draft of the manuscript was written by JMG and LMD and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

*Ethics Approval:* This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the [Blinded for Review] Institutional Review Board.

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## 6. Tables & Figures

Table 1: Demographic and job characteristics for women and men who added children pre- vs. post-PPL (N=442)

| | Women | | | | | Men | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Pre PPL (n=151) | | Post PPL (n=127) | | | Pre PPL (n=93) | | Post PPL (n=71) | | |
| | Percent/Mean | SD | Percent/Mean | SD | *p-value*[1] | Percent/Mean | SD | Percent/Mean | SD | *p-value*[1] |
| **Demographic characteristics** | | | | | | | | | | |
| Age (yrs.) | 34.6 | 5.6 | 33.9 | 6.1 | *0.39* | 36.7 | 6.3 | 36.7 | 6.5 | *0.99* |
| Race/Ethnicity (%) | | | | | | | | | | |
| White | 73% | | 65% | | 0.35 | 63% | | 72% | | 0.69 |
| Asian | 6% | | 6% | | | 10% | | 7% | | |
| Black/African American | 6% | | 7% | | | 15% | | 11% | | |
| Hispanic/Latino | 12% | | 19% | | | 6% | | 7% | | |
| Native American/Alaskan | 1% | | 1% | | | 0% | | 1% | | |
| Native Hawaiian | 1% | | 1% | | | 1% | | 0% | | |
| Two or More Races | 1% | | 2% | | | 4% | | 1% | | |
| **Job characteristics** | | | | | | | | | | |
| Annual salary (%) | | | | | | | | | | |
| Less than $50,000 | 52% | | 43% | | *0.12* | 27% | | 14% | | *0.10* |
| Between $50,000 and $100,000 | 42% | | 54% | | | 66% | | 73% | | |
| Between $100,000 and $150,000 | 7% | | 4% | | | 8% | | 13% | | |
| More than $150,000 | 0% | | 0% | | | 0% | | 0% | | |
| Full time schedule[2] (%) | 81% | | 91% | | *0.01* | 98% | | 86% | | *0.03* |
| Manager[4] (%) | 7% | | 14% | | *0.06* | 14% | | 13% | | *0.81* |
| Tenure (yrs.) | 5.3 | 4.3 | 4.8 | 3.7 | *0.32* | 8.0 | 6.4 | 4.9 | 5.3 | *0.01* |

*Notes: [1] P-values from t-tests to compare means between groups on continuous variables and chi-square tests to assess independence among groups of categorical variables*
*[2] Full time schedule represents working status of 40 hours a week. [4]The variable manager was constructed based on union representation information and consists of employees who are in charge of a unit or a project and are supervising other employees*

Table 2: Paid, unpaid, and total leave days for women and men who added children pre- vs. post-PPL (N=442)

| | Women | | | | | Men | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Pre PPL (n=151) | | Post PPL (n=127) | | | Pre PPL (n=93) | | Post PPL (n=71) | | |
| | Mean | SD | Mean | SD | *p-value*[1] | Mean | SD | Mean | SD | *p-value*[1] |
| **Duration of leave (days)** | | | | | | | | | | |
| Paid leave before birthdate | 5.2 | 4.8 | 5.2 | 3.9 | *0.99* | 3.0 | 3.3 | 2.7 | 2.0 | *0.55* |
| Unpaid leave before birthdate | 0.4 | 2.3 | 0.3 | 1.9 | *0.59* | 0.1 | 0.5 | 0.0 | 0.0 | *0.15* |
| Total leave before birthdate | 5.7 | 5.3 | 5.5 | 4.1 | *0.83* | 3.1 | 3.4 | 2.7 | 2.0 | *0.42* |
| Paid leave after birthdate | 34.0 | 24.0 | 59.8 | 22.2 | *<0.01* | 31.3 | 15.9 | 38.4 | 17.0 | *0.01* |
| Unpaid leave after birthdate | 26.5 | 27.5 | 14.3 | 21.1 | *<0.01* | 3.2 | 10.0 | 0.2 | 1.9 | *0.02* |
| Total leave after birthdate | 60.5 | 27.6 | 74.1 | 25.2 | *<0.01* | 34.5 | 18.0 | 38.6 | 17.1 | *0.15* |

[1] *P-values from t-tests*

Table 3: Leave duration, demographic and job characteristics by cluster for women, pre- vs. post-PPL (N=278)

| WOMEN | Pre PPL | | | | | | | Post PPL | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cluster 1 (n=19) | | Cluster 2 (n=77) | | Cluster 3 (n=55) | | | Cluster 1 (n=46) | | Cluster 2 (n=55) | | Cluster 3 (n=26) | | |
| | Long leave, mostly paid | | Short leave, mostly paid | | Long leave, mostly unpaid | | | Long leave, mostly paid | | Short leave, mostly paid | | Long leave, paid and unpaid | | |
| | Percent/Mean | SD | Percent/Mean | SD | Percent/Mean | SD | *p-value*[1] | Percent/Mean | SD | Percent/Mean | SD | Percent/Mean | SD | *p-value*[1] |
| **Duration of leave** | | | | | | | | | | | | | | |
| Paid leave before birthdate (dys.) | 5.6 | 6.9 | 3.4 | 3.6 | 7.6 | 4.2 | *<0.01* | 3.7 | 2.7 | 5.9 | 4.2 | 6.6 | 4.5 | *<0.01* |
| Unpaid leave before birthdate (dys.) | 0.0 | 0.0 | 0.2 | 1.4 | 0.9 | 3.3 | *0.15* | 0.1 | 0.5 | 0.2 | 0.8 | 0.9 | 4.0 | *0.17* |
| Total leave before birthdate (dys.) | 5.6 | 6.9 | 3.6 | 4.0 | 8.5 | 5.0 | *<0.01* | 3.8 | 2.8 | 6.0 | 4.2 | 7.5 | 4.9 | *<0.01* |
| Paid leave after birthdate (dys.) | 58.5 | 35.4 | 38.0 | 21.2 | 20.0 | 10.4 | *<0.01* | 81.0 | 17.6 | 48.4 | 15.3 | 46.2 | 10.8 | *<0.01* |
| Unpaid leave after birthdate (dys.) | 21.1 | 20.2 | 6.9 | 10.2 | 55.8 | 19.7 | *<0.01* | 3.4 | 9.7 | 8.4 | 12.4 | 46.1 | 19.7 | *<0.01* |
| Total leave after birthdate (dys.) | 79.6 | 36.7 | 44.9 | 21.2 | 75.8 | 18.0 | *<0.01* | 84.4 | 21.5 | 56.8 | 19.7 | 92.3 | 18.1 | *<0.01* |
| **Demographic characteristics** | | | | | | | | | | | | | | |
| Age (yrs.) | 36.5 | 4.4 | 34.8 | 6.2 | 33.6 | 5.0 | *0.15* | 33.6 | 4.6 | 35.5 | 7.2 | 31.3 | 4.7 | *0.01* |
| Race/ethnicity (%) [2] | | | | | | | | | | | | | | |
| White | 74% | | 79% | | 64% | | *0.58* | 65% | | 69% | | 54% | | *0.43* |
| Black/African American | 0.0% | | 6.5% | | 5.5% | | | 4.3% | | 9.1% | | 7.7% | | |
| Hispanic/Latino | 10.5% | | 6.5% | | 20.0% | | | 13.0% | | 16.4% | | 34.6% | | |
| Combined groups not otherwise listed | 11% | | 8% | | 11% | | | 17% | | 5% | | 4% | | |
| **Job characteristics** | | | | | | | | | | | | | | |
| Annual salary (%) | | | | | | | | | | | | | | |
| Less than $50,000 | 21% | | 49% | | 66% | | *0.01* | 28% | | 44% | | 65% | | *0.01* |
| Between $50,000 and $100,000 | 74% | | 46% | | 26% | | | 65% | | 56% | | 27% | | |
| Between $100,000 and $150,000 | 5% | | 5% | | 9% | | | 7% | | 0% | | 8% | | |
| Full time schedule[3] (%) | 79% | | 75% | | 89% | | *0.17* | 93% | | 89% | | 92% | | *0.98* |
| Manager[3] (%) | 5% | | 8% | | 7% | | *0.93* | 33% | | 6% | | 0% | | *<0.01* |
| Tenure (yrs.) | 8.4 | 5.3 | 5.2 | 4.2 | 4.6 | 3.9 | *0.02* | 5.9 | 4.0 | 4.4 | 3.5 | 3.0 | 2.4 | *0.01* |

*[1] P-values from ANOVA to compare means between groups on continuous variables and chi-square tests to assess independence among groups of categorical variables*

*[2] Race/ethnicity: Combined groups not otherwise listed includes Asian, Native American, Native Hawaiian, and two or more races*

*[3] Full time schedule represents working status of 40 hours a week. The variable manager was constructed based on union representation information and consists of employees who are in charge of a unit or a project and are supervising other employees*

Table 4: Leave duration, demographic and job characteristics by cluster for men, pre- vs. post-PPL (N=164)

| MEN | Pre PPL | | | | | Post PPL | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Cluster 1 (n=50) Long leave | | Cluster 2 (n=43) Short leave | | | Cluster 1 (n=36) Long leave | | Cluster 2 (n=35) Short leave | | |
| | Percent/Mean | SD | Percent/Mean | SD | *p-value*[1] | Percent/Mean | SD | Percent/Mean | SD | *p-value*[1] |
| **Duration of leave** | | | | | | | | | | |
| Paid leave before birthdate (dys.) | 3.2 | 4.0 | 2.7 | 2.0 | *0.41* | 2.8 | 2.0 | 2.7 | 1.9 | *0.79* |
| Unpaid leave before birthdate (dys.) | 0.1 | 0.4 | 0.1 | 0.6 | *0.90* | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total leave before birthdate (dys.) | 3.3 | 4.1 | 2.8 | 2.3 | *0.44* | 2.8 | 2.0 | 2.7 | 1.9 | *0.79* |
| Paid leave after birthdate (dys.) | 38.4 | 17.6 | 23.1 | 8.1 | *<0.01* | 46.9 | 17.8 | 29.5 | 10.6 | *<0.01* |
| Unpaid leave after birthdate (dys.) | 5.6 | 13.1 | 0.4 | 2.3 | *0.01* | 0.5 | 2.7 | 0.0 | 0.0 | *0.29* |
| Total leave after birthdate (dys.) | 44.0 | 18.9 | 23.5 | 7.9 | *<0.01* | 47.4 | 17.8 | 29.5 | 10.6 | *<0.01* |
| **Demographic characteristics** | | | | | | | | | | |
| Age (yrs.) | 36.8 | 6.0 | 36.5 | 6.7 | *0.81* | 35.8 | 4.7 | 37.6 | 8.0 | *0.24* |
| Race/ethnicity[2] (%) | | | | | | | | | | |
| White | 62% | | 65% | | *0.75* | 81% | | 63% | | *0.17* |
| Black/African American | 18.0% | | 11.6% | | | 2.8% | | 20.0% | | |
| Hispanic/Latino | 6.0% | | 7.0% | | | 5.6% | | 8.6% | | |
| Combined groups not otherwise listed | 14% | | 16% | | | 11% | | 9% | | |
| **Job Characteristics** | | | | | | | | | | |
| Annual salary (%) | | | | | | | | | | |
| Less than $50,000 | 20% | | 35% | | *0.18* | 14% | | 14% | | *0.95* |
| Between $50,000 and $100,000 | 74% | | 56% | | | 72% | | 75% | | |
| Between $100,000 and $150,000 | 6% | | 9% | | | 14% | | 11% | | |
| Full time schedule[3] (%) | 98% | | 97% | | *0.91* | 86% | | 94% | | *0.30* |
| Manager[3] (%) | 10% | | 19% | | *0.23* | 8% | | 17% | | *0.27* |
| Tenure (yrs.) | 8.5 | 6.1 | 7.5 | 6.7 | *0.47* | 4.0 | 4.20 | 6.0 | 6.24 | *0.19* |

*[1] P-values from t-tests to compare means between groups on continuous variables and chi-square tests to assess independence among groups of categorical variables*

*[2] Race/ethnicity: Combined groups not otherwise listed includes Asian, Native American, Native Hawaiian, and two or more races*

*[3] Full time schedule represents working status of 40 hours a week. The variable manager was constructed based on union representation information and consists of employees who are in charge of a unit or a project and are supervising other employees*

Table 5: Logistic regression models to compare clusters within the pre- and post-PPL periods (N=442). Panel A shows regression results for women in the pre-PPL period and Panel B shows results for women in the post-PPL period.

Panel A: Pre-PPL period sample of women

| | Pre-PPL | | | | | |
|---|---|---|---|---|---|---|
| | Cluster 2 vs 1 (short leave-mostly paid vs long leave-mostly paid) | | | Cluster 3 vs. 1 (long leave-mostly unpaid vs long leave-mostly paid) | | |
| | Model 1 OR (95% CI) | Model 2 OR (95% CI) | Model 3 OR (95% CI) | Model 4 OR (95% CI) | Model 5 OR (95% CI) | Model 6 OR (95% CI) |
| **Demographic** | | | | | | |
| Race/ethnicity[1]: Black/African American vs White | 1.04 (0.26, 4.46) | | 1.01 (0.18, 6.06) | 0.82 (0.16, 3.45) | | 1.45 (0.24, 8.31) |
| Hispanic/Latino vs White | 0.33† (0.09, 0.97) | | 0.22* (0.05, 0.81) | 2.47 (0.84, 7.55) | | 3.25† (1.0, 11.5) |
| Combined groups not otherwise listed vs White | 0.63 (0.19, 1.96) | | 0.88 (0.21, 3.60) | 1.35 (0.40, 4.35) | | 0.80 (0.17, 3.29) |
| Age (yrs.) | 1.00 (0.94, 1.07) | | 0.91† (0.81, 1.01) | 0.98 (0.91, 1.04) | | 1.05 (0.93, 1.17) |
| Annual salary ($): 50k-100k vs >150k | 1.37 (0.33, 6.08) | | 2.78 (0.35, 34.2) | 0.36 (0.08, 1.57) | | 0.25 (0.03, 2.05) |
| Annual salary ($):<50k vs >150k | 1.18 (0.28, 5.23) | | 2.38 (0.26, 33.4) | 0.93 (0.22, 3.94) | | 0.55 (0.05, 5.29) |
| **Job characteristics** | | | | | | |
| Full time[2] | | 0.28† (0.05, 1.03) | 0.31 (0.06, 1.28) | | 3.27 (0.77, 22.48) | 3.82 (0.83, 27.7) |
| Tenure (yrs.) | | 0.98 (0.89, 1.07) | 1.01 (0.91, 1.1) | | 0.93 (0.84, 1.02) | 0.90† (0.80, 1.00) |
| Leadership status: Manager | | 1.63 (0.45, 6.09) | 3.25 (0.61, 25.31) | | 0.82 (0.19, 2.97) | 0.52 (0.06, 3.06) |
| Constant | 0.97 (0.06, 14.9) | 3.12 (0.79, 15.9) | 28.28 (0.26, 35.30) | 1.49 (0.08, 31.5) | 0.33 (0.05, 1.44) | 0.13 (0.01, 13.8) |

Panel B: Post-PPL period sample of women

| | Post PPL | | | | | |
|---|---|---|---|---|---|---|
| | Cluster 2 vs 1 (short leave-mostly paid vs long leave-mostly paid) | | | Cluster 3 vs. 1 (long leave paid & unpaid vs long leave-mostly paid) | | |
| | Model 7 OR (95% CI) | Model 8 OR (95% CI) | Model 9 OR (95% CI) | Model 10 OR (95% CI) | Model 11 OR (95% CI) | Model 12 OR (95% CI) |
| **Demographic** | | | | | | |
| Race/ethnicity[1]: Black/African American vs White | 1.04 (0.24, 4.7) | | 0.85 (0.12, 5.31) | 1.69 (0.22, 9.09) | | 2.61 (0.29, 21.2) |
| Hispanic/Latino vs White | 0.71 (0.24, 1.99) | | 0.68 (0.18, 2.37) | 1.79 (0.57, 5.54) | | 3.87 (0.84, 20.5) |
| Other vs White | 0.5 (0.09, 2.09) | | 0.36 (0.01, 3.62) | 0.39 (0.02, 2.86) | | - |
| Age (yrs.) | 1.10** (1.02, 1.19) | | 1.20** (1.06, 1.37) | 0.92 (0.84, 1.01) | | 0.91† (0.76, 1.01) |
| Annual salary ($): 50k-100k vs >150k | - | | - | 0.11† (0.01, 1.00) | | 0.08 (0.02, 1.19) |
| Annual salary ($):<50k vs >150k | - | | - | 0.27 (0.03, 2.69) | | 0.09† (0.01, 1.59) |
| **Job characteristics** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Full time[2] | | 2.17 (0.26, 44.9) | 1.58 (0.11, 41.1) | | 0.94 (0.09, 20.8) | 0.78 (0.04, 21.2) |
| Tenure (yrs.) | | 0.99 (0.88, 1.12) | 0.89 (0.75, 1.04) | | 0.81* (0.62, 0.97) | 0.78† (0.58, 0.99) |
| Leadership status: Manager | | 0.19* (0.03, 0.75) | 0.28 (0.03, 1.52) | | - | - |
| Constant | 0.001 (0.01, 0.01) | 0.34 (0.02, 2.82) | 0.00 (0.00, 0.01) | 13.3 (0.29, 29.04) | 0.73 (0.03, 7.58) | 55.2 (0.22, 341.30) |

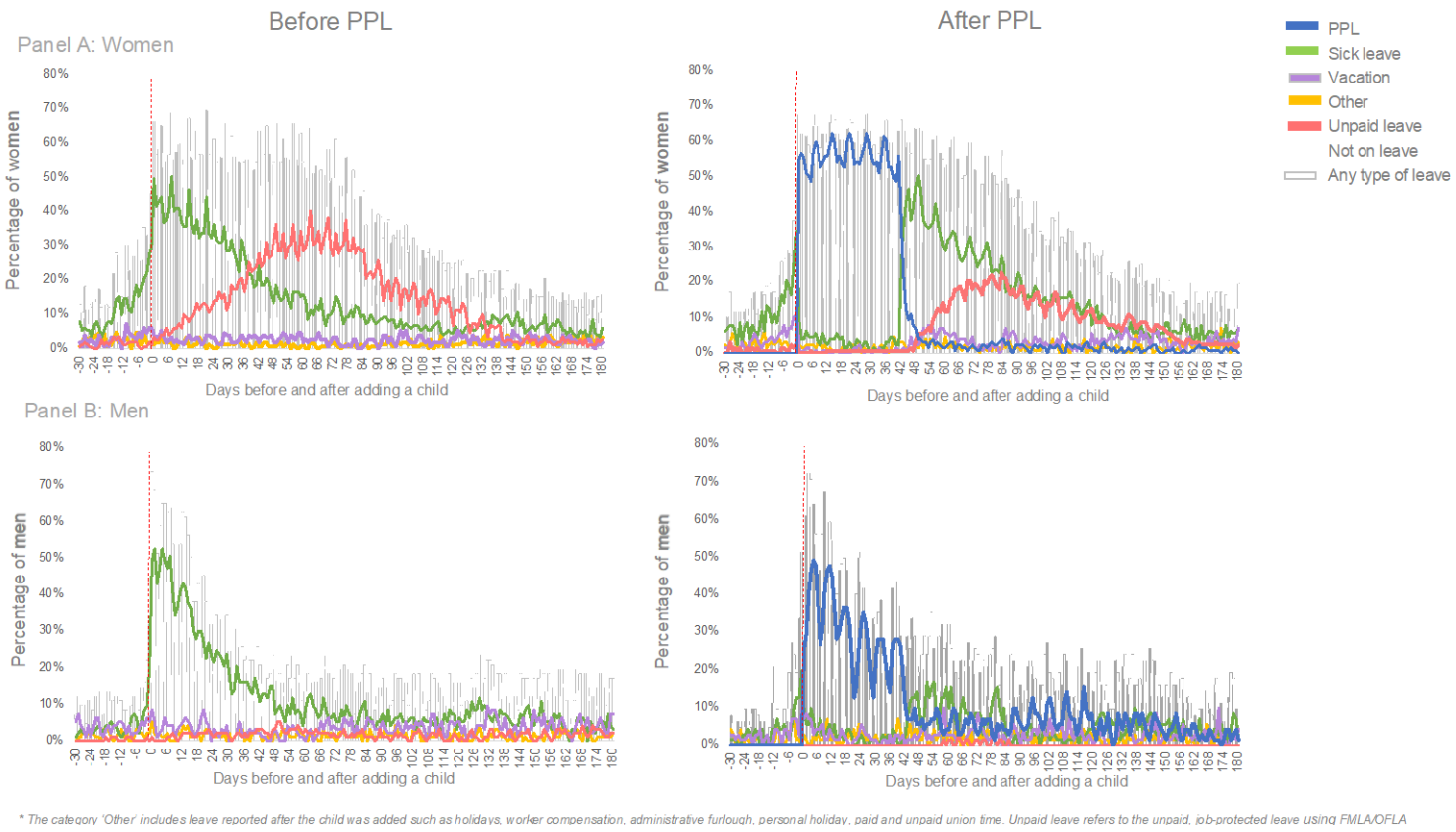
†p<0.10; *p<0.05; **p<0.01; ***p<0.001

*[1] Race/ethnicity: Combined groups not otherwise listed category is comprised of Asian, Native American, Native Hawaiian, and two or more races*

*[2] Full time schedule represents working status of 40 hours a week. The variable manager was constructed based on union representation information and consists of employees who are in charge of a unit or a project and are supervising other employees*

**Fig 1.**

*Sequence analysis for women (panel a) and men (panel b), before and after the introduction of a paid parental leave policy.*




*Note.* Figures depict types of paid and unpaid leave in the 30 days prior to and 180 days after a child's date of birth. Panel a shows the leave patterns for women before and after the paid parental leave (PPL) policy went into effect; panel Bbshows these patterns for men. The x-axis contains the days before and after the child's date of birth (vertical dotted red line that divides the sequence) and the y-axis represents the percentage of employees who reported leave on the specific day. The grey bars represent the combination of all leave types.

**Fig 2.**

Cluster distribution by group (women and men, pre- and post-PPL), with an exemplar trajectory for each cluster.


*Note.* PPL=paid parental leave