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Impact of Taking Family Leaves Across Finnish Fathers' Wage Distribution

The Impact of Taking Family Leaves Across Finnish Fathers' Wage Distribution

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Evidence is mixed as to whether less- or more-advantaged fathers suffer penalties for taking paid family leave and the reasons for this. Perhaps selection into taking leave differs among fathers, or taking leave increases some fathers' commitment to family over paid work, or taking it sends a negative signal to employers about future work-family priorities. We contribute to the literature by distinguishing between the initial paternity leave taken by the majority of fathers, and subsequent solo paternal leave taken by fewer fathers that indicates and signals greater family commitment. We also develop competing hypotheses about why low- or high-wage fathers may be penalized more for taking family leave. These are tested analyzing 2001 to 2014 waves of Finnish administrative panel data using unconditional quantile regression with various fixed-effects models. Net of selection, no fathers incur a sustained wage penalty for taking paternity leave, although distributed fixed-effects models reveal the highest-wage fathers receive a temporary penalty that we attribute to signaling. All fathers who also take solo paternal leave have decreasing post-leave wage trajectories. Only lower-wage fathers accrue significant penalties, however, suggesting that taking the leave shifts their priorities more toward family. We conclude the repercussions of

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taking shorter or longer family leaves and their sources differ across fathers' wage distribution.

Introduction

The transition to parenthood is a “critical juncture” for gender equality (Evertsson and Boye 2018: 471), characterized by significant changes in heterosexual couples' divisions of paid and unpaid work. Whereas men's time use does not change much following the birth of a child, women often interrupt and adapt employment to accommodate caring demands (Baxter, Hewitt, and Haynes 2008; Killewald and Garcia-Mangano 2016). The gender difference in employment and family work is a dominant explanation for the gender wage gap (Becker 1985). Some of the gap may be due to selection, in that individuals who are more committed to family and less committed to work may be more likely to take family leaves. Leaves may also have causal effects. Any type of leave can lower wages, firstly because taking leaves allows skills, or “human capital” to depreciate because they are not being used or refreshed (Mincer and Ofek 1982). Secondly, taking family leave may cause workers' priorities to shift away from paid work and more toward family (Gangl and Ziefle 2015). A third causal possibility is that taking family leave sends a negative signal to employers about work commitment (Weisshaar 2018). Consequently, policies such as well-paid paternity and parental leave targeting men are seen as key institutional supports for gender equality. They narrow the gender gap in employment interruptions predicted by parenthood and lead to more equal divisions of caring afterwards (Almqvist and Duvander 2014; Bünning 2015; Evertsson, Boye and Erman 2018).

As predicted by the theories, most single-country studies find that taking paid family leave negatively affects men's as well as women's wages (Albrecht et al. 1999; Theunissen et al. 2011; Coltrane et al. 2013; Albrecht, Thoursie, and Vroman 2015; Evertsson 2016). Some studies show that men are penalized more harshly than women for taking much shorter family leaves, which is attributed to stronger signaling effects as men are more likely than women to be continuously employed after a birth (Albrecht et al. 1999, 2015; Theunissen et al. 2011; Evertsson 2016). As a result, men's family leaves veer more from employer expectations (Evertsson 2016).

There is conflicting evidence about whether family leave wage penalties differ among fathers. One Norwegian study finds that only less-educated fathers incur a significant wage for taking the fathers' month, concluding this is because the leave increases their prioritization of family over paid work (Rege and Solli 2013). Conversely, Swedish studies with varying samples and leave measures find that penalties for taking it are greater for more advantaged fathers that are attributed to signaling (Albrecht et al. 1999, 2015; Evertsson 2016).

We make three significant contributions to this literature. First, we differentiate between wage effects for proxies of the three weeks of *paternity leave* that is taken when mothers are also on leave, with the wage effects of subsequent weeks of *solo paternal leave* that can only be taken when mothers have returned

to employment. Most fathers in countries with both types of leave take paternity leave, whereas fewer fathers take solo paternal leave (Koslowski et al. 2019). This highlights the importance of selection, which we address more comprehensively than done in parental leave studies to date.

Second, we attempt to differentiate between signaling and greater family prioritization as possible causes of wage effects by mapping the wage trajectories for the two groups after they take each type of leave. We argue that signaling is indicated if penalties occur immediately after taking the leave, but subsequently rebound. In contrast, constant or increasing wage penalties in subsequent years suggest a shift in men's priorities more toward family.

Third, we generate competing hypotheses about why family leave wage effects may vary across the wage distribution. The dominant premise in the literature is that the employer cost for reductions in work commitment increases as wages increase (Acker 1990; Albrecht et al. 1999, 2015; England et al. 2016; Cooke and Hook 2018). This premise leads researchers to hypothesize that the penalties for taking family leave should increase as wages increase.

Our counter-argument is that lower-wage workers are more vulnerable to penalties because they have fewer within- and between-workplace options for enhancing their wages (Manning 2003; Cooke and Fuller 2018). In addition, the disparate nature of low- and high-wage jobs means that taking leave is less likely to shift high-wage men's career commitment, but may increase low-wage men's prioritization of family over their low-skilled, routine jobs. There are similar arguments explaining skill differences in women's work-family choices (Hook and Paek 2020). This leads to the competing hypothesis that wage penalties for taking family leave are greater for lower- than higher-wage fathers.

To test the hypotheses, we use a nationally representative sample of men aged 20–45 taken from 2001 to 2014 waves of Finnish register data and estimate the impact of paternity and solo paternal leaves across fathers' wage distribution using unconditional quantile regression (UQR) with individual fixed effects (FE; Borgen 2016) and also controlling for group-specific slopes (Morgan and Winship 2015; Ludwig and Brüderl 2018). UQR is preferred over the conditional quantile regression used by Albrecht et al. (2015), because the interpretation of UQR estimates does not change when adding covariates to the model (Firpo, Fortin, and Lemieux 2009). This is particularly important when comparing results from nested wage models to glean the role and nature of selection as we do here.

Reasons for Family Leave Wage Effects

Selection

The association between family leave and wages may not be causal, but due to heterogeneity among fathers. Negative selection would account for wage penalties if the fathers who are more family-oriented and less committed to employment are more likely to take family leaves. This is analogous to the negative selection argument used to account for motherhood wage penalties

(England et al. 2016). Evertsson (2016: 33) finds evidence of negative selection among Swedish fathers of children born 1999 to 2002, for whom significant wage penalties for taking leave in OLS models become negligible when controlling for individual fixed effects (FE). This means their wage *levels* were already lower prior to taking leave. Here we also explore the possibility that penalties reflect in part that fathers take leave when they are at a point in their careers of lower wage *growth*. This can be ascertained by comparing estimates from individual FE models with those controlling for group-specific slopes (FEGS) (Ludwig and Brüderl 2018). A leave penalty in an FE model that lessens when controlling for group slopes indicates some of the penalty is because the fathers already had lower wage growth prior to the leave.

The possibility of positive selection has not been considered in the literature, even though fathers commonly cite economic or career concerns as reasons for not taking leave (Bygren and Duvander 2006; Geisler and Kreyenfeld 2011; Kaufman 2018; Salmi, Närvi, and Lammi-Taskula 2018). Dual-earner couples dominate OECD countries, but men are usually still the primary family breadwinner (Klesment and Van Bavel 2017). Fathers who take family leaves with less than 100 percent earnings replacement would therefore be putting a strain on family budgets. This suggests that only fathers making higher wages or on a steeper wage trajectory feel economically secure enough to take family leave, and longer leaves in particular. If there is positive selection on wage levels or growth, OLS estimates of fathers' leave would predict a wage premium that is reduced when controlling for individual FE or group-specific slopes.

Causal Explanations

Human capital and signaling are the dominant theories of a causal impact of leave on wages, and both predict only penalties. In human capital theory, wages reflect individuals' accumulated education, work experience, and on-the-job training (Becker, 1964). Human capital depreciates when not used, and individuals out of the labor market forego interim opportunities for on-the-job training (Becker 1964; Mincer and Ofek 1982). Human capital depreciation implies that penalties for time out of the labor market should increase as the length of absence increases, but otherwise be similar regardless of the reason for the break. This, however, is not always the case (Albrecht et al. 1999; Theunissen et al. 2011; Weisshaar 2018).

Specialization theory is an extension of the human capital model as applied to household divisions of paid and unpaid work (Becker 1981). A central tenet of specialization is that time spent on family related tasks negatively affects wages because it reduces individuals' finite store of "effort" (Becker 1981, 1985). Fathers who take parental leave are more likely to take an active role in childcare after they return to work (Almqvist and Duvander, 2014; Bünning, 2015). The longer the leave, the more equal the sharing of childcare (Almqvist and Duvander 2014; Evertsson et al. 2018), which Becker (1985) would argue reduces men's work effort. However, there is no evidence that time spent doing childcare directly predicts wage penalties, especially for men (see Cooke and Hook 2018 for a review).

What has been shown is that increasing the length of paid parental leave reduces German women's self-reported work commitment (Gangl and Ziefle 2015). Paid parental leave could similarly encourage a shift in fathers' commitment away from work and toward family, as evident in part by their increased time in childcare. In addition, similar to mothers, fathers might decline to work extra hours, refuse promotions that interfere with family life, reduce work-related travel, and otherwise adjust their work commitment to better accommodate family. If using family leave leads to men's greater prioritization of family, taking it would predict greater wage penalties than other work interruptions.

This is the case in the United States, where opting out of employment for family predicts a larger wage penalty (Coltrane et al. 2013) and lower hiring probability (Weisshaar 2018) than other work interruptions. The United States is fairly unique, however, being one of the few affluent economies that does not have national paid family leaves (Koslowski et al. 2019). In countries that offer paid family leaves, unemployment predicts a larger wage penalty than taking family leave (Albrecht et al. 1999; Theunissen et al. 2011). Still, studies to date indicate the family leave penalty is larger for men than women even though fathers take just a fraction of family leave days (Albrecht et al. 1999, 2015; Theunissen et al. 2011; Evertsson 2016). If men incur larger percentage penalties for shorter family leaves, this suggests possible signaling effects.

Signaling is a type of statistical discrimination, where employers make hiring, promotion, training, and wage determinations based on (real or perceived) group differences in productivity (England 2017; Weisshaar 2018). From an organizational standpoint, an ideal worker is someone unencumbered by family demands, embodied by men's breadwinner role in a gendered division of family labor (Acker 1990). Choosing to take family leave directly violates the worker ideal, sending instead a negative signal to employers about work commitment (Evertsson 2016).

The strength of the negative signal of family leave is likely greater for men as they remain the primary breadwinner in couple households in most OECD countries (Klesment and Van Bavel 2017). Men have increased their care work over the past half century, but women are still the primary carers (Cooke and Baxter 2010). Employers may therefore penalize fathers more harshly than mothers for taking less family leave because taking it diverges more from expectations, sending a stronger negative signal (Albrecht et al. 1999, 2015; Theunissen et al. 2011; Coltrane et al. 2013; Evertsson 2016). Even without direct measures of commitment, the commitment and signaling explanations suggest different patterns of wage effects for different leaves, as discussed next.

Differentiating Between Causes

Type and Length of Leave

To provide insights into possible signaling and commitment effects, our first contribution is to distinguish between *paternity leave* and the *solo paternal leave* that follows it. Paternity leave is available in most affluent economies,

taken while the mother is also on leave (Koslowski et al. 2019). Parental leave is available afterwards, often with weeks reserved for fathers, but usually with the restriction that the other parent must be at work (O'Brien and Wall 2017; Koslowski et al. 2019). Paternity leaves are generally perceived as fathers "helping" mothers after the birth, whereas caring for the child alone indicates a greater individual caring commitment (O'Brien and Wall 2017). Consequently, both negative signaling and the possibility of a subsequent prioritization of family are greater for solo paternal leave:

Hypothesis 1: The wage penalty will be greater for taking solo paternal than paternity leave.

Wage Effects Over Time

Our second contribution is to distinguish between signaling and commitment as causes by assessing the temporal variation in wage effects of each type of family leave, similar to the studies using distributed FE to assess the causal impact of marriage on men's wages (c.f., Dougherty 2006; Cheng 2016; Killewald and Lundberg 2017). Traditional FE models control for stable unmeasured heterogeneity, but assume that effects are truly fixed after the event of interest (Dougherty 2006). In contrast to this static perspective, family transitions are profound events in the life course, potentially having long-term repercussions on behavior (Dougherty 2006; Cheng 2016). Taking family leave is one possible step associated with the transition to parenthood that may have wage repercussions if it reprioritizes men's commitment away from work and toward family.

Looking more closely at the annual pattern of post-leave wage trajectories therefore better distinguishes between possible signaling and changing work commitment explanations. If employers punish fathers' pre-emptively because taking leave sends a negative signal, the penalty could rebound if the father continues to display work commitment in subsequent periods, or indeed chooses to change employers to recoup his prior wages. Consequently:

Hypothesis 2: Signaling effects are indicated if fathers who take family leave incur a wage penalty immediately after, but wages rebound.

Signaling effects could occur with either the short paternity or the longer solo paternal leave. If, however, taking more leave during the early post-birth period induces fathers to lessen their work commitment as Gangl and Ziefle (2015) found for German mothers, fathers taking solo leave may subsequently alter their employment behaviors to better accommodate family, such as limiting additional work hours, turning down more demanding tasks at work, reducing work travel, and the like. This adjustment of work-life balance would negatively affect subsequent accumulation of human capital and other workplace advantages, just as motherhood is generally argued to negatively affect women's. We do not have direct measures of work and family commitment; neither are the data refined enough to assess many small changes in work-related behaviors. But we deduce

such a reprioritization if wage penalties persist after taking family leave, and especially among fathers taking the subsequent solo leave:

Hypothesis 3a: A reprioritization of commitment away from work and toward family is indicated if wage penalties among fathers who take family leave sustain or increase in the years following the first leave.

Hypothesis 3b: The reprioritization pattern is most likely among fathers taking solo paternal leave.

Variation in Effects Among Fathers

Our third contribution is to hypothesize competing reasons why wage effects for taking family leaves vary among fathers. First, we are agnostic about how selection might vary across men's wage distribution. On the one hand, higher relative wages may be particularly important to lower-wage fathers because of their general lack of financial resources. On the other, the leave wage replacement rate in our country case drops sharply above the median hourly wage, such that higher-wage men suffer a larger temporary loss in income.

Regarding causal effects, a prevalent argument in the literature is that employer costs for real or perceived drop in work commitment increase as wages increase. Employer investment in on-the-job training and expectations of worker commitment are greater for higher-wage employees (England et al. 2016). Jobs at the top of the distribution may also be more sensitive to effort and commitment (England et al. 2016). This suggests higher-wage fathers face larger penalties for taking leave:

Hypothesis 4a: From a relative employer cost perspective, wage penalties for taking family leave should be greater for higher- than lower-wage men.

Three Swedish studies support this perspective, with penalties for taking leave greater for more highly educated fathers (Albrecht et al. 1999; Evertsson 2016) or higher-wage fathers (Albrecht et al. 2015). All three studies have sample or measure issues, however, that limit generalizability even within Sweden. The 1992 data used by Albrecht et al. (1999) capture only parental leaves longer than 3 months, which at the time included a very select group of fathers. A later paper exploring the contribution of parental leave to the glass ceiling in Sweden limits the sample to white-collar workers (Albrecht et al., 2015). The data used by Evertsson (2016) are representative of Swedish firms with more than 500 employees, whereas the vast majority of Swedish firms have fewer employees (Johansson 1997).

There are good reasons to doubt that high-wage workers suffer larger penalties for taking family leave. Higher-wage workers generally have greater autonomy and access to more flexibility options than lower-wage workers (Bygren and Duvander 2006; Halldén, Levanon, and Kricheli-Katz 2016). Higher-wage jobs tend to be more engaging than low-wage jobs, suggesting that taking paternal

leave is unlikely to dramatically lessen high-wage men's career priority (Geisler and Kreyenfeld 2011). Furthermore, if their employers were to penalize them for taking family leave, higher-skilled fathers are more mobile and can change jobs to find better wages (Manning 2003). Cooke and Fuller (2018) find that high-skilled Canadian fathers are more likely to move jobs around the birth of their first child than less-skilled fathers and to increase their fatherhood wage premium when doing so.

In contrast, lower-earning employees face more constraints. They are easier to replace due to higher supply and lower training costs, so lower-wage fathers have less power to countermand an imposed wage penalty (Manning 2003). They also have lower job mobility, with Canadian low-skilled fathers who moved around the first birth incurring wage penalties (Cooke and Fuller 2018). Another possibility is that the repetitive and mundane nature of many lower-wage jobs makes a reprioritization of family over employment subsequent to the leave a more fulfilling alternative. The lower quality of low-skill jobs is one offered explanation for why low-wage women are less likely to return to employment following a birth (Hook and Paek 2020). The constraints and reprioritization arguments are consistent with the evidence that only less-educated Norwegian fathers incur penalties for taking the father-only month-long leave (Rege and Solli 2013). A competing hypothesis is therefore:

Hypothesis 4b: Given relative employee constraints and likelihood of leave encouraging a reprioritization of family over employment, wage penalties for taking family leave should be greater for lower- than higher-wage men.

Method

Country Case

Assessing the impact of fathers' family leaves across the wage distribution requires a country case where different types of leaves are offered, and with nationally representative panel data to generalize effects among fathers net of observed and stable unobserved characteristics. We therefore choose Finland because of its long-standing provision of earnings-related paid family leave for men, as well as its high-quality register data spanning the period. By 1993, Finnish fathers were entitled to three weeks of paid paternity leave that can be taken while mothers are on either post-partem maternity leave or subsequent parental leave that is taken by the vast majority of mothers (Salmi et al. 2018).¹ Average earnings replacement rates are generous at about 70 percent (SPIN 2018), although benefits taper off above the median to just 25 percent for high earners (Salmi et al. 2018). Fathers were offered two bonus weeks of leave in 2003 and two more in 2010 if they took at least 2 weeks of additional leave when mothers have returned to work (Salmi et al. 2018). We refer to more than 3 weeks of leave following a birth as *solo paternal leave*, to distinguish it from the 3 weeks or less of *paternity leave* that can be taken while the mother is also on leave. Employers must be notified at least 1 month in advance if a father will take a leave of less than 12 days, and 2 months in advance for longer leaves.

Finland is not representative of all affluent economies, however. Generous Nordic family policies more aggressively target fathers than in other countries (Koslowski et al. 2019). The labor market arrangements also keep income inequality among the lowest in the OECD (OECD 2016). This suggests the variation among Finnish fathers in the wage impact of family leave may be more muted than would be found in more unequal markets such as the United States or Great Britain, were the latter countries to offer similar paid family leaves and administrative data for analysis.

Nonetheless, there is sufficient variability within the Finnish pay setting system for leave-related wage effects to emerge even if fathers stay with the same employer. The centralized Finnish wage negotiations are limited to minimum task wages and suggested wage increases, but wage levels at or exceeding agreed minimums are set locally (Uusitalo and Vartiainen 2008). Some industries also give the firm the right to adjust a person's pay according to individual performance, with productivity-related pay schemes widely adopted since the 1990s for blue- and white-collar workers (Uusitalo and Vartiainen 2008). Finnish fathers are also free to change employers, although Cooke and Fuller (2018) found this benefited only high-skilled Canadian fathers' wages.

Data and Sample

Finnish administrative data for 2001–2014 are used to explore wage effects among fathers for taking family leave. The main sources of the data are the Finnish Longitudinal Employer-Employee Data (FLEED)² and the Structure of Earnings Statistic (SES) that covers the wage structure of individuals working in public or private enterprises with five or more employees. These data are created by Statistics Finland and comprise a one-third random sample of persons aged 15–70 who lived in Finland between 1988 (1995 in the SES) and 2014. Linking FLEED and SES to various administrative registers, our data include full time-varying information on birth and partnership histories, education, and numerous background characteristics.

From these data, we draw a sample of Finnish men age 20–45 beginning in 2001, who become fathers for the first time from 2003 onwards and for whom we have wage information for at least 4 years for the fixed-effects with group-specific slopes models (Ludwig and Brüderl 2018). We consider first births starting in 2003, because that is the year the fathers' bonus solo leave was introduced. Limiting the sample to men who eventually become fathers provides a counterfactual of fathers who never take any type of leave to weaken the assumption of temporal heterogeneity in fixed-effects models (Brüderl and Ludwig 2015: 332; see also the online Technical Appendix: Counterfactual). The main analytical sample is comprised of 98,597 men (742,488 person years) who become fathers for the first time in 2003 and thereafter.

Variables

The dependent variable is the log of hourly wages (inflated to 2014 prices using the Consumer Price Index) from the SES data. Statistics Finland calculates

the hourly wage from the total gross earnings including overtime, bonuses, and performance pay, divided by the number of all work hours reported by employers. Hourly wages are preferred over earnings (Petersen 1989), as they are net of work hours that may also change after a birth.

The key independent variables are two time-varying measures of family leave use that are derived from the data. The first is a binary variable that changes to one when the father previously took only 3 weeks or less of leave, which is the *paternity leave* around the birth that can be taken jointly while the mother is also on leave. The second is an indicator that changes to one when fathers previously took more than 3 weeks of leave during the post-birth period, which we use as a proxy for the *solo paternal leave* that fathers can only take once the mother has returned to employment. Finnish mothers usually take their full 9 months of maternity and parental leave, such that fathers most often would first take solo leave later in the child's first year of life (Salmi et al. 2018). We include a further control variable for when the father is currently on leave so we do not conflate wage effects of being on leave with those subsequent to having taken it.

We need to derive the leave because actual weeks of leave are not available in the data and could not be obtained from the Social Security Institute of Finland (KELA) due to access restrictions. To do so, we use fathers' earnings and family leave benefit levels. First, we convert annual to weekly earnings in the year before birth. Second, we calculate the equivalent of 70 percent (or 40 or 25 percent as appropriate for prior earnings levels) of these weekly earnings, as earnings replacement rates of the family leave benefit are quite consistent across the period (SPIN 2018). Third, we compare the replacement level of weekly earnings with the annual family leave benefits received by a father. If fathers received leave benefits that are less than 4 weeks' worth of replacement-level earnings following the birth, we use this as a proxy for taking paternity leave. Fathers receiving a leave benefit amount at the replacement-level earnings for more than three weeks are considered taking the subsequent solo paternal leave some time during the post-birth period. We cannot specify exactly which weeks (fathers need not take weeks consecutively), as the proxies are derived from annual information, but know because of benefit restrictions that fathers cannot take more than three weeks of leave with the mother. As indicated in Table 1, our proxies are quite close to the best estimates of annual usage percentages for all fathers that can be derived from KELA's (2013) annual statistical yearbook.

Standard controls include demographics, human capital, region, and period that also affect wages. One indicator is for men who are legally married (*referent*: single, cohabiting, divorced or widowed). We tested a second indicator for cohabiting men, but it did not improve the model or affect main estimates (results available from authors). Also included is a variable for number of children. Human capital is measured with a time-varying Mincerian approximation using age for potential experience, age squared, and education. Education is time-varying in the data, and measured with three dummy variables based on the ISCED definitions: low (lower secondary or less, *referent*), medium (vocational or general upper secondary), and high (university). A further indicator controls

Table 1. Comparison Percentage of Fathers on Each Type of Leave, Proxy from Analytical Sample Versus Information on all Fathers from KELA Annual Statistical Yearbook (2013)

	Paternity leave, short paternity leave of up to 18 days, %		Father's month, long paternity leave, %	
	Sample	KELA Annual Statistical Yearbook	Sample	KELA Annual Statistical Yearbook
2003	69.4	79.6	12.1	6.6
2004	69.1	77.8	12.8	9.3
2005	69.9	79.2	14.5	10.1
2006	70.3	79.3	17.0	10.9
2007	72.0	83.0	22.0	12.8
2008	73.2	83.2	24.8	17.6
2009	72.4	80.3	28.6	20.2
2010	73.2	81.6	34.9	23.2
2011	74.3	82.5	36.2	29.8
2012	75.0	83.8	37.8	31.8
2013	74.0	83.0	35.5	33.1

Notes: KELA is the Social Insurance Institution of Finland: <https://www.kela.fi/web/en>. The KELA estimate is derived by using the number of parenthood allowance spells begun in a given year from Table 60 (KELA, 2013: 153) as the denominator. From Table 63 (2013: 156), we use the number of fathers taking paternity leave during the parental leave allowance period as the numerator to estimate the percentage on paternity leave, and the number of fathers receiving parental allowance to estimate the percentage of fathers taking solo paternal leave.

for periods in full-time education as four percent of fathers experienced a first birth before attaining their highest degree. Effects are robust when excluding them (results available from authors). We also create interaction terms between the age and age-squared variables and indicators for fathers who ever took only paternity leave, and those who ever took paternity plus solo paternal leave, to control for group differences in returns to experience in fixed-effects models (Ludwig and Brüderl 2018).

Further controls include a continuous measure for months of unemployment in a calendar year (0–12), indicators for region of residence (urban (*referent*), semi-urban, and rural municipalities), and indicators for period to control for business cycles and other policy changes (2001–2006 (*referent*), 2007–2010, 2011–2014).

Descriptive statistics are displayed in Table 2. The mean age at first birth increases as wages increase, but on average even the lowest-wage fathers are almost 30. Two children is the mode, with less than 20 percent of fathers having three or more children. The vast majority of fathers takes at least paternity leave. Less than one-third of low-wage fathers and almost 60 percent of high-wage fathers also take solo paternal leave.

Table 2. Descriptive Statistics by Quantiles, 20–45 year old Finnish men who became fathers after 2003, followed 2001–2014

Variable	Wage quantiles									
	10th	20th	30th	40th	50th	60th	70th	80th	90th	
Hourly wages in €	Mean 12.03	14.77	16.54	18.21	19.95	21.94	24.41	28.16	41.79	
	(sd) (1.66)	(0.56)	(0.48)	(0.48)	(0.53)	(0.63)	(0.82)	(1.45)	(81.78)	
Annual earnings in €	Mean 26,378	31,210	34,810	38,340	41,963	46,048	51,232	58,719	85,327	
	(sd) (10,130)	(7,410)	(7,035)	(7,230)	(7,742)	(8,353)	(9,468)	(11,859)	(50,595)	
Ever taken up paternity leave	% 81.08	87.24	88.93	89.20	90.52	91.25	90.95	89.43	84.31	
Ever taken up solo paternal leave as well	% 28.93	32.22	34.79	38.88	45.74	50.44	54.18	57.69	58.42	
Education										
Low	17.2	12.7	9.7	7.7	6.0	4.8	4.4	3.8	3.4	
Medium	60.0	61.2	58.6	53.1	45.0	36.2	30.2	18.9	12.0	
High	22.8	26.1	31.7	39.2	49.0	59.0	65.4	77.3	84.6	
In education	% 16.1	11.3	9.8	8.7	8.3	7.7	6.4	4.9	4.1	
Number of Children										
1	30.5	31.2	30.7	29.5	28.0	26.9	26.4	25.5	23.3	
2	48.8	50.1	51.2	52.2	53.8	55.3	56.4	57.0	58.4	
3	16.5	15.2	14.8	15.0	15.2	15.1	14.8	15.4	16.3	
4+	4.2	3.5	3.3	3.3	3.0	2.7	2.4	2.1	2.0	
Months unemployed	Mean 0.4	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	
	(sd) (1.3)	(0.8)	(0.8)	(0.8)	(0.8)	(0.7)	(0.5)	(0.5)	(0.4)	
Never unemployed	% 67.0	74.9	77.2	79.5	83.0	86.2	88.9	91.1	93.95	
Married at first birth	% 47.6	49.1	52.6	55.0	58.2	62.9	65.6	71.2	74.9	
Age at first birth	Mean 29.0	29.6	29.8	30.1	30.4	30.8	31.3	31.9	32.7	
	(sd) (4.9)	(4.7)	(4.6)	(4.4)	(4.3)	(4.1)	(4.0)	(3.9)	(3.7)	
Age	Mean 30.4	31.6	32.2	32.6	33.2	33.7	34.5	35.4	36.6	
	(sd) (5.6)	(5.3)	(5.1)	(5.0)	(4.8)	(4.6)	(4.5)	(4.3)	(4.2)	
Person years	82,523	82,519	82,522	82,520	82,520	82,521	82,518	82,513	82,332	742,488
Fathers	7,515	9,125	9,802	10,232	10,483	11,028	12,138	13,018	15,256	98,597

Source: Finnish LEED and Structure of Earnings data, 2001–2014.

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Analytical Strategy

Quantile Regression

Examining the impact of family leaves across Finnish fathers' wage distribution requires a regression technique that allows the coefficients to take on different values at different points (quantiles) of the distribution. [Albrecht et al. \(2015\)](#) use conditional quantile regression (CQR) to estimate the impact of taking parental leave on Swedish fathers' wages. The limitation of CQR is that adding covariates can alter the underlying distribution of the dependent variable ([Firpo et al. 2009](#)). This limitation also means it is not suitable for running nested models to ascertain the importance of selection on wage levels and growth as we do here.

Instead, we follow a growing sociology literature that uses the two-step UQR estimator developed by Firpo and colleagues (2009; see [Cooke 2014](#); [Cooke and Hook 2018](#); [England et al. 2016](#)). The advantage of this technique is that the first step estimates the "recentered influence function" (RIF) to create a transformed dependent variable, in our case log of wages, that retains the same absolute low-to high- ordering of fathers' wages along the distribution ([Firpo et al. 2009](#)). The online Technical Appendix: UQR Equations provides further details.

We therefore use UQR to estimate the impact of previously taking paternity leave or of also previously taking solo paternal leave at the 20th, 30th, 40th, 50th, 60th, 70th, and 80th quantiles of Finnish fathers' wage distribution. We include both leave measures in the equation because we need to control for the effects of having first taken paternity leave to estimate the effect of also taking solo paternal leave. Post-estimation tests revealed no significant collinearity between the two previous leave measures. We exclude results for the 10th and 90th quantiles because measurement error is greater at the extremes of any distribution. Clustered standard errors account for multiple observations of individuals in the FE models. Given the size of the sample, bootstrap standard errors provide similar standard errors.

Model Set 1: Selection

As confirmed in the descriptive statistics, paternity leave in Finland is taken irrespective of socio-economic background, whereas use of the subsequent solo leave is more likely among more advantaged fathers. This pattern indicates that selection into the different types of leaves differs, and may also differ across the wage distribution. To assess the extent and nature of selection effects, we use UQR to estimate the impact of previously taking paternity and previously taking solo paternal leave in three nested models.

Model 1 is an estimate of the wage impact of the two types of leave on the pooled cross-sectional sample controlling only for period, region, and current leave. In this model the referent is fathers who never take any family leave. Given the family income repercussions of taking leave, we anticipate fathers taking leave earn more than the counterfactual group, especially those fathers taking solo paternal leave. Model 2 reveals how much selection on observed and stable unobserved individual characteristics accounts for the wage effects

of Model 1 by adding further controls for marital status, number of children, human capital, unemployment, and controlling for individual FE (Borgen 2016). In the FE models, fathers serve as their own referent, so fathers' wage *levels* post-leave are compared with wages before taking the leave.

Results from traditional FE models are biased if the treatment groups of interest differ not only on wage levels, but also on relative returns to experience, indicating selection on wage *growth* (Ludwig and Brüderl 2018; Morgan and Winship 2015). The standard FE model can be extended to allow for this with group-specific slopes (FEGS) (Morgan and Winship 2015). We accomplish this in Model 3 by adding to Model 2 the interaction terms created between the two experience variables and the dummies indicating ever taking just paternity or ever taking solo paternal leave as well.³

Results Model Set 1: Selection and the Wage Impact of Family Leaves Among Fathers

UQR estimates of the impact of previous paternity and previous solo paternal leave on wages across the distribution under the three nested models are presented in Table 3 (full Model 3 in online Supplementary Appendix Table A1). Reported in Table 3 are the exponentiated coefficients from the models, interpreted as the average predicted percentage change in hourly wages for having taken paternity leave or having taken solo paternal leave as well.

Model 1 is the OLS estimate of wages associated with the leaves as compared with fathers who do not take any leave, controlling only for region, period and whether the father is currently on leave. Results support our supposition that fathers positively select into taking either type of leave, except for the highest wage earners for the joint paternity leave. Fathers at the 20th quantile who take paternity leave earn 6.1 percent more than low-earning fathers who take no leave, whereas fathers at the 80th quantile earn 1.8 percent less than the highest-earning fathers who take no leave. In contrast, the wage advantage of fathers who also took solo paternal leave vis-à-vis fathers never taking leave is greater and increases as wages increase. The lowest-wage fathers who also took solo paternal leave earn 16.1 percent more than low-wage fathers taking no leave, and the highest-wage fathers earn 24 percent more.

Model 2 estimates indicate how taking the leaves on average affects fathers' own wages afterwards. Net of observed and stable unobserved individual characteristics, the impact of having taken paternity leave ranges from 2.9 percent at the 20th quantile, to one percent at the 50th quantile, and -1.9 percent at the 80th. These results confirm that Finnish fathers below the 70th quantile of hourly earnings positively select into taking the leave, with the variables and FE accounting for about half of the premium predicted in Model 1. In contrast, the predicted penalty for taking paternity leave for fathers at the 80th quantile changes little as compared with Model 1. This indicates that negative selection on pre-leave wage levels does not account for much of high-earning fathers' penalties for taking joint leave.

As with paternity leave, Model 2 estimates for solo paternal leave indicate that positive selection on observed and stable unobserved individual characteristics accounts for most the large premium associated with it in Model 1. The patterns among fathers differ, however. Low-wage fathers' 16.1 percent premium in Model 1 becomes a 3.2 percent penalty in Model 2, indicating that despite earning more than fathers who do not take any leave, taking solo paternal leave hurts these fathers' post-leave wage levels. The penalty lessens as wages increase, becoming instead a slight premium at the 50th quantile. At the 80th quantile, taking solo leave predicts a 3.6 percent wage premium. Hence, much but not all of the premium in Model 1 for higher-earning men who took solo leave is accounted for by positive selection on pre-leave wage levels, whereas net of selection, lower-earning fathers who took solo paternal leave incur penalties.

The FECS estimates in Model 3 further control for possible heterogeneity in pre-leave wage growth among fathers who took the leaves. For paternity leave, controlling for group-specific slopes slightly reduces the premium for fathers across the bottom half of the wage distribution and eliminates the penalties at the top. This indicates that lower earning fathers who took paternity leave had not only higher wage levels prior to the leave (per Model 2), but also slightly steeper wage growth. The elimination of the penalties among higher-earning fathers who took paternity leave indicates these fathers were on a lower wage trajectory prior to taking leave. In all, positive selection on both wage level and growth accounts for most but not all of the positive wage effects for taking paternity leave among lower-earning fathers, whereas negative selection on wage growth accounts for all of the negative wage effect for higher-earning fathers who took paternity leave.

For fathers who also took solo paternal leave, the converse pattern persists in Model 3. Controlling for group-specific slopes reduces but does not eliminate the penalties of Model 2 for fathers earning below the median, to between -0.7 and -1.2 percent. Consequently, lower-earning fathers who took solo paternal leave, in contrast to those who took joint, had lower wage growth prior to taking the leave. Controlling for group-specific slopes also reduces the predicted premiums among higher-earning fathers for having taken solo leave, indicating these fathers had greater wage growth prior to taking leave. Net of selection, fathers at the 60th through 80th quantiles who took solo paternal leave are predicted to earn wage premiums of about one percent afterwards.

To summarize conclusions from the nested models, no Finnish father is significantly penalized for taking joint leave once controlling for selection on observed and stable unobserved differences in pre-birth wage levels and growth. The first hypothesis that penalties would be greater for taking solo rather than joint leave is supported, but only for lower-earning fathers. The solo leave wage pattern supports hypothesis 4b, that penalties for taking the leave are greater for lower-earning fathers.

Model Set 2: Differentiating Causes

The second set of models provides insight into whether changing commitment or signaling accounts for the wage effects of taking the family leaves (Hypotheses 2,

3a, and 3b). The FEGS models in the prior section provide the average impact of taking leave on wages, obscuring how effects unfold along fathers' life courses as they develop their caring relationships with their children after the leaves. In addition, traditional fixed-effects models overweigh short-run effects and negatively weigh long-run effects (Borusyak and Jaravel 2017).

Distributed FE models map the trajectory of wages after each type of leave that allows us to assess how the premiums or penalties from the FEGS models accrued over time to point to either potential signaling or shifting work-family priorities. To do this, we first limit the observation window to those men having first births between 2003 and 2008 so that we can follow all fathers for a minimum of 6 years.⁴ We select this duration because all regular family leaves or care allowances cease by the child's third birthday (Salmi et al. 2018), and the likelihood of second births during this period is high (Erlandsson 2017), covering the majority of fathers who have just one or two children (per Table 2). We therefore map wage effects across the years of early parenthood, when fathers' caring relationships with their children are established.

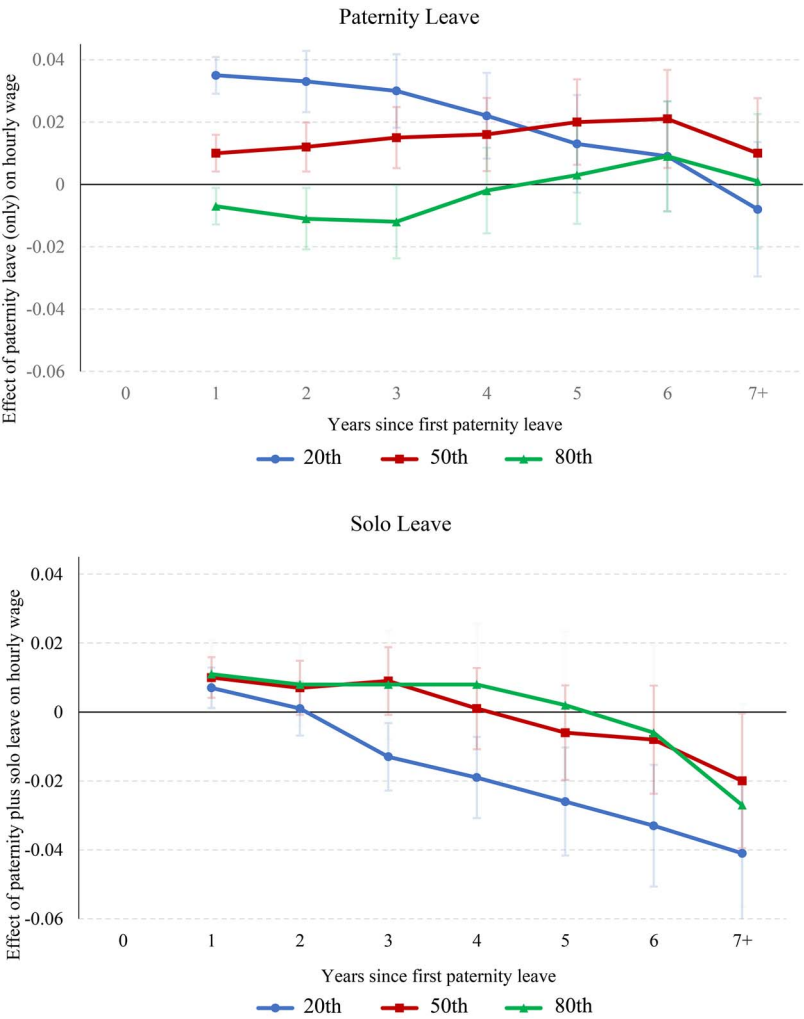
For the distributed effect, we create time dummies for each year following the first leave, making the year of leave the time referent (Ludwig and Bruderl 2018). We do not include the main leave variables, but instead interact the time dummies with a variable capturing ever paternity leave take-up only, and another set of interactions between the time dummies and ever solo leave measure. These time dummies reveal the trajectory of net wages after the first leave for fathers taking just paternity leave, and those who take both paternity and the solo paternal leave. If net wages first fall but then rebound, we interpret this as support for the hypothesis that employer signaling accounts for leave-taking penalties (H2). If instead wages fall and either do not rebound or continue to decrease, this suggests that taking leave has shifted fathers' prioritization more to family and he has adjusted work accordingly (H3a). We anticipate reprioritization is more likely for fathers taking the solo paternal leave (H3b).

Results Model Set 2: Signaling or Reprioritization?

Figure 1 displays the annual post-first-leave wage trajectories with 95 percent confidence intervals for Finnish fathers who took just paternity leave (top panel), and those who also took solo leave (bottom panel). To keep displays clear, we contrast the wage trajectories at the 20th (blue circles), 50th (red squares), and 80th (green triangles) quantiles, but full model results are in online Supplementary Appendix Table A2.

Model 3 FEGS results indicated that taking paternity leave on average predicts a modest premium for low-wage fathers, a slightly smaller premium for fathers at the median, and has a statistically insignificant negative impact on high-earning fathers' wages. The patterns of wages displayed in the top panel of Figure 1 reveal these averages hide different over-time trends among fathers. The wage advantage of the lowest-earning fathers taking paternity leave is highest in the first year following leave, but ebbs over time to be indistinguishable from zero seven or more years after the first leave. This suggests some possible

Figure 1. Coefficients for post-first-birth change in net wages for fathers who took paternity (top) and solo paternal leave (bottom), Finnish fathers age 20–45 with first births 2003–2008.



Notes: Displayed are the wage effects and 95% confidence intervals in each year after the first birth, controlling for period, region, currently on any leave, marital status, number of children, education, age, age squared, unemployment, age*ever paternity leave, age-squared*ever paternity leave, age*ever paternity + solo leave, and age-squared*ever paternity + solo leave.

reprioritization toward family subsequent to joint leave, but resulting in only a declining wage advantage rather than a penalty.

Fathers at the median who take only paternity leave have a small premium that increases slightly until 6 years after the first paternity leave and then falls somewhat in the subsequent years. This pattern points to neither signaling nor reprioritization among Finnish fathers at the median of the wage distribution, as

the general trend is a small but steady increase in wages through the early years of parenthood.

In contrast, the highest wage fathers incur a significant penalty in the first 2 years after first taking paternity leave, but wages then begin to rebound. This indicates that the highest-wage fathers are the only ones facing some short-term penalty for taking joint leave, consistent with the signaling effects of hypothesis 2. That only the highest-wage fathers' wages are negatively affected supports hypothesis 4a. These results are consistent with Swedish studies finding that parental leave effects are greater for more advantaged fathers, as well as their conclusions that effects result from signaling (Albrecht, et al. 1999, 2015; Evertsson 2016).

The cross-distribution patterns differ less for fathers who go on to take solo paternal leave (bottom panel Figure 1). The distributed patterns suggest broad support for the third set of hypotheses, indicating a greater reprioritization to family in the years following first taking leave (H3a) that is more pronounced among fathers going on to take solo leave (H3b). What varies across the wage distribution is the timing and steepness of the decreasing wages. No father incurs a penalty in the year after first taking family leave, but the wages of the lowest earning fathers decrease the most in subsequent years. Among fathers at the 20th quantile of hourly wages, a significant 1.3 percent penalty first emerges in the third year post-leave and continues to increase to a 4.2 percent penalty by the seventh year.

Higher-earning fathers fare better. The wage trajectories of fathers at the 50th and 80th quantiles who take solo leave are quite similar through the third year after first taking family leave, earning about a one percent premium. After the third year, the earnings of fathers at the 50th quantile begin to decrease more quickly than those of fathers at the 80th. By the seventh year, however, the penalty at the 50th quantile is about 2 percent, whereas the penalty at the 80th is almost 2.5 percent, albeit with confidence intervals that overlap zero and each other.

In all, the wage patterns indicate that only low-wage fathers who took solo leave accrue steep and significant wage losses in the subsequent years. We interpret this as indicating their greater prioritization of family following solo leave, much as mothers are argued to reduce aspects of employment such as travel or forego demanding promotions that would interfere with family. This is consistent with Rege and Solli's (2013) evidence and conclusions for less-educated Norwegian fathers who took that country's similar father month. The patterns for solo leave only also support hypothesis 4b, that penalties would be greater for lower- than higher-wage fathers.

Discussion and Conclusions

The few studies to date exploring the impact of family leave on men's wages come to divergent conclusions. One Norwegian study finds penalties only for less-educated fathers who take the dedicated "daddy's month," which the authors attribute to these men's reprioritization of family over employment. Swedish studies, in contrast, find the penalty for taking variously-measured leaves is

greater for more advantaged men, which they attribute to stronger signaling effects (Albrecht et al. 2015; Evertsson 2016).

In this paper, we attempt to untangle the conflicting evidence in three ways. First, we differentiate effects of our proxies for both the widely taken paternity leave while mothers are also on leave, with subsequent weeks of solo paternal leave taken by a minority of fathers when the mother has returned to employment. Solo paternal leave indicates a stronger commitment to family care work and also sends a stronger signal to employers, so should predict larger wage penalties (H1). Second, we attempt to differentiate signaling (H2) and changing commitment (H3a, b) as causes of wage effects by mapping paternity and solo leave-takers' wage trajectories using distributed fixed-effects models. Finally, we develop competing hypotheses why low- or high-wage fathers might incur larger penalties for taking leave. The employer cost of lost productivity is higher with higher-wage employees (H4a), but lower-wage workers are more constrained in their options if employers impose a penalty (H4b). We test these hypotheses by estimating both nested and distributed FEGLS models using UQR and 2001 to 2014 waves of high-quality Finnish panel administrative data. We find that differences in wage effects among fathers and possible causes depend on the leave.

Nested models reveal that both selection processes and patterns of wage effects differ across the distribution and with the type of leave. There is little economic gradient in Finnish fathers' take-up of paternity leave. Nonetheless, low- to moderately-waged fathers positively select into taking paternity leave as compared with fathers who do not take any leave, and earn significantly greater wages net of selection. The smaller percentage of the highest-wage fathers who take only paternity leave, conversely, are negatively selected and penalized. Results from the nested models suggest they earn less than the highest-wage fathers who take no leave, but the penalties disappear once controlling for selection in the FEGLS models.

However, the distributed fixed-effects model suggests the highest-wage fathers' nil effect in the nested FEGLS model obscures possible signaling penalties. Their wages significantly decrease in the first three years after taking the leave, but ultimately rebound. Under the second hypothesis, we asserted this pattern indicates signaling effects rather than any longer-term change in fathers' work commitment following a family leave. This would be the case whether the initial employer once again raised wages to reflect their true productivity, or the penalized fathers changed employers to recoup the lost wage levels. Assessing which is more likely is beyond the scope of this paper, but would be an excellent topic for future research. The distributed effects for fathers at the 80th quantile who took only paternity leave also support hypothesis 4a, that real or feared drops in the highest-wage workers' employment commitment are viewed most harshly by employers. The highest-wage fathers who take only paternity leave, however, are a minority and had lower earnings growth prior to the leave. Their employers may have therefore more quickly assumed that taking family leave sends a further negative signal about their work commitment. Whether signaling

occurs more for weaker employees would also be an interesting topic for future study.

There is stronger positive selection into taking the additional weeks of subsequent solo leave, especially for higher-wage fathers. As anticipated, net of selection, taking solo leave predicts a penalty for more fathers than did taking joint paternity leave (H1). In contrast to paternity leave, though, results for solo leave support the relative employee constraints hypothesis (H4b), that penalties for taking leave are greater for lower-earning fathers. Still, the distributed fixed-effects models reveal a steady decrease in wages after taking solo regardless of fathers' wage level; it is just that the decrease occurs sooner and is sharpest for the lowest-wage fathers. We interpret the over-time wage trends as evidence that taking solo leave encourages fathers to reprioritize family over work (H3b).

Why are only lower-wage fathers being penalized for taking solo leave, when all fathers are similarly positively selected? One possibility is that the opportunity to spend time alone caring for a child has a more profound effect on lower-wage fathers' priorities. Dual-caring is not as deeply established among lower-wage workers (Davis and Greenstein 2009). Lower-wage fathers have less opportunity to take solo leave because Finnish mothers take more leave days, as well as the subsequent home care allowance available until the child's third birthday (Salmi et al. 2018). Less-skilled Finnish mothers spend more time on paid parental leave because the jobs available to them offer fewer intrinsic as well as monetary rewards (England, Gornick, and Shafer 2012; Hook and Paek 2020). The same can be said of fathers' low-wage jobs. It is therefore possible that when low-wage fathers have the opportunity to take solo leave, they find time and attention to family more satisfying than their paid work. In contrast, higher-wage fathers have positions that contain not only greater autonomy, but high intrinsic and extrinsic rewards. Time spent alone with a child might therefore have a less profound impact on high-wage men's priorities and time use, even though a larger proportion of these men take some solo leave. Future mixed-methods research might confirm these possibilities.

There might also be differences across fathers' wage distribution in the nature of fathering encouraged during leaves. Time-diary evidence finds that more highly-educated fathers spend more time in childcare than less-educated fathers (see Cooke and Baxter 2010 for a review). Qualitative studies, however, suggest that more advantaged fathers spend more time doing "public" fathering such as attending school functions, whereas less-advantaged fathers do more of the routine daily care work (Gillies 2009; Shows and Gerstel 2009). It is daily routine domestic tasks usually done by women that predict larger wage penalties (Cooke and Hook 2018). Low-wage fathers might therefore incur penalties soon after starting leave because they are doing more of the hard graft of daily care work than their high-wage peers (Gillies 2009), a possibility to be explored in future research across more countries. Future studies might also overcome a key limitation of our data if they have information on which weeks each partner is taking leave, rather than our somewhat rough proxies for the two types of leave.

Another limitation of the study is that the data, while excellent for generalizing, are not refined enough to test directly for possible changes in fathers'

employment relationships to account for the wage patterns. An exploratory analysis confirmed that taking solo, but not joint paternity leave predicts a significant drop in monthly work hours (results available from authors). Future research with suitable data might explore the mechanisms behind the observed wage patterns, and if the mechanisms vary with fathers' wage levels.

It is worth emphasizing that for current take-up rates of our proxies for both types of leaves, the majority of Finnish fathers incur no significant wage penalty. This should encourage more fathers to take the leaves, and encourage policy makers to offer longer leaves targeting fathers. If, as we anticipate, fathers' wage penalties would increase as a result, this suggests that increasing the length of men's paid parental leave and its take up is indeed a path to greater gender equality in caring and smaller gender wage gaps.

Notes

1. Evertsson (2016) differentiated the length of Swedish paternal leave, but her measure of the paternity leave that precedes it was confounded by the inclusion of up to 50 days of child sick leave.
2. https://www.stat.fi/tup/mikroaineistot/me_kuvas_henkilo_en.pdf.
3. Ludwig and Brüderl (2018: 752) note that FEGLS estimates may still be biased if individual deviations from group-specific slopes are systematically related to the timing of the treatment variable, and suggest using fixed effects with individual slopes (FEIS). However, there is no Stata code for doing FEIS with UQR and the manual estimation detailed in Brüderl and Ludwig (2015: 337) entails detrending wages, which may alter the rank order of the wage distribution that we use UQR to retain.
4. Similarly limiting the sample in the first set of models to only those fathers with births 2003–2008 yields similar FEGLS estimates and identical pattern of effects across the wage distribution.

Supplementary Material

Supplementary material is available at *Social Forces* online, <http://sf.oxfordjournals.org/>.

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