The Fatherhood Premium: Mirage or Reality? How Do Occupational Characteristics Matter

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Abstract

A differential fatherhood premium exists among selected groups of fathers of various socio-economic backgrounds. Besides marital status, residential arrangement, biological paternity, and other demographic dimensions, the mechanisms associated with fathers' structural characteristics of work that produce divergent labor market outcomes are less well understood. The authors leveraged the cases of productivity and specialization, family and responsibility, and compensating differentials and examined the impacts of work context and occupational characteristics on the pay gap between fathers and non-fathers. Based on joint data from the 1997-2015 National Longitudinal Survey of Youth (NLSY97) and Occupational Information Network (O*NET) (n = 37,138), the authors used fixed-effects models to estimate the associations between job features and the fatherhood premium. The regression results showed that occupations entailing competition and requiring on-the-job training are associated with more wage bonus; occupations offering inflexible schedule are associated with less wage gain. These work-related characteristics further emphasize fathers' work structure and context, human capital accumulation, and work-family conflict. Overall, these findings are consistent with the theoretical perspectives of productivity and specialization and compensating differentials, adding new evidences to the structural explanations of the fatherhood premium.

Keywords

Fatherhood premium, occupational characteristics, work-family conflict

Social scientists have been interested in studying the relationships between parenthood and labor market outcomes (Mu and Xie 2016). Economists and sociologists have estimated the consequences of childbearing on educational attainment and career choice (Goldin 1995), labor supply (Angrist and Evans 1998), income (Killewald 2012; Mu and Xie 2016; Yu and Kuo 2017), and other subjective wellbeing (such as Margolis and Myrskylä 2011). The general conclusion has been that the effect of parenthood on labor market outcomes is gendered (Magnusson and Nermo 2017). Women tend to be penalized for being mothers, known as the "motherhood penalty", and men tend to be awarded for being fathers, known as the "fatherhood premium"

(see Mu and Xie 2016 for a review). Previous researches have studied various demographic elements that may moderate the price that mothers pay or the reward that fathers get; structural characteristics of work that differentiate income among parents are less well studied and understood.

Studies examining the variation in the wage differentials between parents and non-parents tend to focus on two strands of literature. One strand argues

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that the persistently unequal household division of labor (Sayer 2010) creates work-family conflict. Once having children, women tend to spend more time in the unpaid childrearing activities and less time in the paid labor force, taking on a second shift at home, lowering their productivity at work, weakening their job performance, and undercutting their financial awards than non-mothers (Hochschild and Machung 1989). On the contrary, once having children, men tend to direct more energy in primary bread-winning activities and less energy in the secondary domestic sphere (Becker 1985), assuming their roles as main breadwinners, concentrating their effort at work, accumulating greater human capital, and enhancing their earning potentials than non-fathers. Work-family conflict may, therefore, partially explain the parental wage differentials. The second strand argues that individual characteristics, such as ascriptive status, family structure, and educational attainment, may be associated with the parental wage differentials (e.g. Glauber 2007; 2008; Hodges and Budig 2010). However, very few studies have explored the associations between work-related characteristics and the parental advantages and disadvantages in earnings (Magnusson and Nermo 2017), and the mother's case on wage penalty takes the lead (Yu and Kuo 2017). This paper investigates how occupational characteristics matter for the fatherhood premium.

The theorization of the fatherhood premium is inconclusive. Many studies have positively identified a wage gap between fathers and non-fathers (see Killewald 2012 for a review); some studies have concluded that not all but specific kinds of fathers, who are white, married, and professional, enjoy such a wage gain (Hodges and Budig 2010). Moreover, socio-economic backgrounds may interact with residential arrangement and biological paternity; only married residential fathers and biological fathers have a statistically significant wage premium (Killewald 2012). Demographics, in part, explain the fatherhood

premium; micro-level occupational characteristics are important mechanisms to be examined as well. Wage differentials are strongly correlated across occupations (Dickens and Katz 1987); work-related characteristics also impact males' role performance at home, since work and family constitute their first and second life interests (Aldous 1969). Many theoretical frameworks of the fatherhood premium suggest that structural characteristics of work would condition such a wage benefit. Based on three possible explanations of: (1) productivity and specialization; (2) family and responsibility; and (3) compensating differentials, the authors tested the hypothesis that the variation of the fatherhood premium may be accounted for by occupational differences in work structure and context. Using fixed-effects models, the authors estimated the moderating effect of work-related characteristics on the fatherhood wage bonus. This study contributes to the literatures in family sociology and social stratification by linking childbearing decisions and career choices to parental wage differentials. The results of this research shed new light on the factors associated with parental labor market outcomes in the broader socio-economic context.

SOURCES OF THE FATHERHOOD PREMIUM

Previous studies have suggested several explanations that fathers tend to receive higher wages than non-fathers. Some focus on fathers' labor market productivity and specialization, some emphasize employers' views and opinions on fathers vs. non-fathers, and some stress fathers' work-family balance and its associated opportunity cost. This study takes a different approach and investigates how occupational characteristics moderate the fatherhood premium. The authors focus on three mechanisms with different implications, explaining the reasons that occupational characteristics may amplify or mediate the fatherhood premium.

Productivity and Specialization

The explanation of the fatherhood premium often dwells on the household division of labor between heterosexual parents (Becker 1981; 1985). Mothers tend to be focused caregivers, providing unpaid labor in the domestic sphere. Fathers tend to be focused breadwinners, developing marketable skills, exerting labor power, and concentrating on paid work. Such gendered division of labor constitutes the foundation of the perspective of productivity and specialization. Occupational characteristics, such as autonomy, on-the-job training, and workplace competition, may be confounded with specialization. Professional/managerial occupations granting autonomy allow workers to set their own agenda and make their own schedule, and such workers tend to receive the largest fatherhood premium due to hegemonic masculinity being institutionalized (Hodges and Budig 2010). Moreover, occupations requiring on-the-job training allow workers to specialize in firm-specific and, therefore, non-transferable skills, boosting productivity with one firm/sector. Fathers, who choose to receive extra training at work, are associated with determination and perseverance, and it is expected that the wage gain is larger for fathers with additional, specialized, on-the-job training. Last but not least, competitive occupations attract competent and ambitious fathers, and they may be awarded with extra dough for their earnest and ardent character and style. With the perspective of productivity and specialization, the authors expect fathers, who enjoy autonomy, obtain on-the-job training, and withstand competition at work, to be recognized with extra pay.

Family and Responsibility

From the employer's perspective, hiring is an investment under uncertainty (Spence 1973). Besides formal education, fatherhood may be a signal of a logical life-course progression of responsibility (Hodges and Budig 2010). Numerous studies have shown that fatherhood is a transformative process that deters men from immature actions and promotes social organizational involvement (Augustine, Nelson, and Edin 2009). Employers may perceive fathers to be more responsible, stable, and deserving, who are under the pressure of providing for a family, so the family and responsibility argument would support a fatherhood premium (Killewald 2012). Previous studies have shown that married fathers are noticed for their strong commitment for their work and, therefore, are recommended for a higher starting salary, comparing with married non-fathers (Correll, Benard, and Paik 2007). Moreover, under certain difficult circumstances, such as exposures to hazardous conditions, fathers may not "chicken out" but "suck it up" because they may have to bear harsher conditions at work to provide for what is needed at home (Kmec 2011). Finally, changes in actions and conducts may be associated with occupational structures and characteristics. It is shown that fathers tend to have longer job tenure, and seniority may be one reason for the fatherhood premium (Millimet 2000). The longer one works for a firm, the more experience and insight knowledge one accumulates, and more importantly, the more benefits one reaps and garners. Overall, based on the perspective of family and responsibility, the authors expect fathers, who undergo arduous conditions at work and who have longer job tenures, to be awarded with extra pay.

Compensating Differentials

Parents may have different job preferences than non-parents (Becker 1981); they may accept a lower wage for a desirable job (Miller Jr. 2004), formally known as the compensating differentials (Smith 1979). Like mothers, fathers may have to let go high paying jobs, which tend to be more competitive, and choose jobs that are compatible with family obligations. Jobs with family-friendly conditions, such as a safe environment (less or no hazardous exposure), a

flexible schedule, and an autonomous management, are desirable, and fathers may sacrifice some pay to have their preferred conditions. Based on the perspective of compensating differentials, the authors expect fathers to enjoy less fatherhood premium, receive no fatherhood premium, or even take a fatherhood/parenthood penalty than non-fathers. No study has tested how occupational characteristics are associated with the fatherhood premium, and only a handful of studies have explored if parents would be more likely to be employed in jobs with family-friendly policies (Yu and Kuo 2017). To one's surprise, male-dominated jobs tend to have more flexible schedules, unsupervised breaks, and paid sick leaves (Glass 1990). Whether the fatherhood premium exists in different occupations and how work-related characteristics impact such a premium are empirical questions to be explored in this paper.

DATA AND METHODS

The authors used fixed-effects models to study the fatherhood premium and its variation by comparing men's log wages with different occupational characteristics. Based on three possible explanations for the fatherhood wage premium—productivity and specialization, family and responsibility, and compensating differentials—the authors test whether this wage premium changes with varying degrees of schedule regularity/inflexibility, hazardous exposures, on-the-job training, competitiveness, autonomy, and teamwork importance, proposed by Yu and Kuo (2017). Since the mothers' wage penalty is not uniform across all occupations and industries (Yu and Kuo 2017), neither should the father's wage bonus. The differential job structure and work context may moderate the award that men receive for fatherhood.

The authors included men of all occupations and industries in one model and added in interaction terms with union affiliation, firm size, and various locations. Glauber (2008) and Killewald (2012) estimated

models for fathers of various marital status, race and ethnicity, and residential arrangement, and studied how the fatherhood premium changes as number of children changes without changing their occupational characteristics. The authors are different from their approach, as they allowed a more flexible relationship among: (1) job nature; (2) job flexibility; (3) job strain, and fatherhood, because changes in these elements may happen simultaneously (Killewald 2012; Yu and Kuo 2017).

The authors used a male subsample from the 1997-2015 National Longitudinal Survey of Youth (NLSY97) (Bureau of Labor Statistics 2018). Men born from 1980 to 1984 were interviewed yearly from 1997 to 2011/2012 and biyearly thereafter. The most recent data come from round 16 conducted in 2015. They found the NLSY97 to be a testable sample, because most respondents were in their mid- to late-30s in the last round, and many of them have completed their education, found a job, and started a career; some of them have become parents. They excluded subsamples of non-interviewers, and the remaining sample contains 4,599 respondents. They selected records of employee-type jobs only, because self-employed jobs tend to have its own line of working conditions and constraints (N = 54,048). They also selected records with more than one employee-type jobs over 16 waves (N = 53,974) to guarantee that each respondent has multiple observations. They further selected records with the most recent job reported since the last interview, so wage is reported. Their final regression sample contains 4,262 respondents and 37,138 person-year observations.

The authors also used a subsample of occupational characteristics from the Occupational Information Network (O*NET) dataset[1]. They selected elements of: (1) Level of Competition; (2) Work with Groups or Teams; (3) Exposure to Hazardous Conditions; (4) Work Schedules (regularity/inflexibility); (5) Work Structures (task-, priority-, and goal-setting); (6)

Freedom to Make Decisions; and (7) Frequency of Decision Making from the "Work Context" section of O*NET, and each element has context scores between 1 and 5, with 1 indicating least possible and 5 indicating most likely. Like Yu and Kuo (2017), the authors averaged the scores and indexed each element with a single value for each occupation and characterized "Autonomy" by averaging the scores from Work Structures, Freedom to Make Decisions, and Frequency of Decision Making. The authors further selected one element of On-the-Job Training (OJT) from the "Education, Training, and Experience" section of O*NET; the number of months of OJT is recorded for each occupation. They calculated the correlations among these occupational characteristics in the male subsample, and the results in Table 1 indicate that each element represents a different aspect of an occupation.

VARIABLES AND ANALYTIC STRATEGIES

The dependent variable, male "log hourly wage", has a mean of $6.87, which is comparable to the one of females ($6.78) though marginally bigger in cents. The main independent variable, "number of children", measures the actual number of children that a respondent has. It is a time-varying variable based on each interview. The authors also used a binary variable indicating fatherhood, and the regression results were similar. The number of children is significantly different between males and females. Males, on average, have less children (.28) than females (.54). Though some male respondents have become fathers in the sample, more female respondents have become mothers, which is in line with the gendered division of labor. The male index of occupational education (43.86), developed by Hauser and Warren (1997) and updated by Frederick (2010), is substantially lower than the one of females (52.60), which may be consistent with the fact that there are far more women who recently graduate from college with

occupational skills than men in more developed countries (Goldin, Katz, and Kuziemko 2006; Vincent-Lancrin 2008).

In terms of job experiences, the authors calculated the weeks of work experience since age 14 from two variables, "Weeks in Employee-Type Job from Age 14 through Age 19" and "Weeks in Employee-Type Job from Age 20" and converted weeks into years with a factor of 52. They included the years of current job tenure and a squared term of years of current job tenure, which was calculated based on the number of weeks of total tenure at an employee-type job. Tenure-squared may reflect the predicted non-linear relationship between job tenure and performance (Sturman 2001). They included the total number of employment breaks that respondents reported from each interview. Like Budig and England (2001) and Yu and Kuo (2017), the authors considered an employment break as a gap between jobs of six weeks or more since a job of least six weeks in duration. The sample of NLSY97 provided the total number of weeks in gaps as a cumulative measure if a gap lasts more than 52 weeks. They calculated the number of employment breaks and counted a gap that lasted more than one year as one break. Since the age of 14, the male subsample has, on average, 3.41 employment breaks.

In terms of firm and job characteristics, the authors included binary variables indicating full-time (35 hours or more per week) and part-time status, union status (unionized, not unionized, and unknown union status), firm size (small firm with less than 30 employees, medium firm between 30 and 299 employees, large firm with 300 or more employees, and unknown firm size), and firm location (multiple locations, single location, and unknown number of location). They also included the proportion male in each occupation from the 2000 Census and industry dummies based on the 2002 Census Industrial Classification Codes (agriculture, mining, utilities, construction, non-durable manufacture, durable

Table 1. Weighted Descriptive Statistics of Occupational Characteristics

	Mean	SD	Correlations					
			Hazardous exposure	Schedule regularity	Required job training	Competitiveness	Autonomy	Teamwork needed
Hazardous exposure (1 to 5)	1.97	.87	1.00					
Schedule regularity (1 to 3)	1.35	.22	.41	1.00				
Required on-the-job training (months)	8.08	8.09	.42	.26	1.00			
Competitiveness (1 to 5)	2.95	.51	.05	.02	.36	1.00		
Autonomy (1 to 5)	3.88	.37	.01	-.05	.29	.42	1.00	
Teamwork needed (1 to 5)	4.14	.39	-.18	-.03	.10	-.02	.28	1.00

manufacture, wholesale, retail, transportation, information, finance, professional, education, healthcare, arts, service, public administration, and others).

In terms of demographic control variables, the authors included marital status in four categories, including: (1) Married; (2) Cohabiting; (3) Not in Union; and (4) Unknown Marital Status. They also included respondents' geographic locations in four categories, including: (1) North East; (2) North Central; (3) South; and (4) West. They further included the urbanism of the respondents, including urban vs. rural living arrangements. For "Educational Attainment", the authors used a binary variable indicating the school enrollment status of respondents and a categorical variable indicating degree obtained, including: (1) Less than High School; (2) High School Graduate or General Equivalency Diploma (GED); (3) Associate's Degree; and (4) Bachelor's or More Advanced Degree. See Table A1 in Appendix for descriptive statistics of all variables.

In this study, the authors implemented two-way fixed-effects models to study the fatherhood premium:

$$\ln(wage_{it}) = \theta_0 + \theta_1 children_{it} + \sum \alpha_j X_{jit} + \sum \beta_j (X_{jit} \times children_{it}) + \sum \sigma_k Y_{kit} + \sum \mu_{\tau-1} T_{t\tau-1} + \sum \delta_{n-1} I_{in-1} + \varepsilon_{it},$$

where the dependent variable is the nature log of hourly wage of male respondent i (i = 1, 2, 3, …, n) at time t (t = 1, 2, 3, …, τ). θ_0 is the intercept, and θ_1 is the coefficient of interest, indicating the impact of number of children ("fatherhood") on wage. X_{jit} is a vector of j occupational characteristics variables from O*NET; $\sum \alpha_j$ are coefficients of these j occupational characteristics; $\sum \beta_j$ are coefficients of the interaction terms between occupational characteristics from O*NET and number of children, indicating the extent to which the wage gap differs between fathers and non-fathers by occupational characteristics (Yu and Kuo 2017). Y_{kit} is a vector of other control variables, including educational attainment, marital status, job and firm characteristics, and residential region and arrangement; $\sum \sigma_k$ are coefficients of these variables. $\sum \mu_{\tau-1} T_{t\tau-1}$ and $\sum \delta_{n-1} I_{in-1}$ are fixed effects for τ - 1 times and n - 1 individuals. ε_{it} is the error term. Initial survey weights from the NLSY97 are used in all the fixed-effects models, and robust standard errors are estimated in all regression analyses.

Fixed-effects models are ideal for this study; it controls for between-individual variations that may last over time (Becker 1985). The authors recognized that childbearing decisions may be endogenous rather than exogenous (Angrist and Evans 1998), and men who choose to become fathers may be different in unobserved ways from those who do not. These characteristics may be personal motivation, career

inspiration, work ethic, and family value and responsibility, which are all directly and indirectly related to labor market choices and outcomes (Budig and England 2001). Such selection bias may exist, and the authors implemented fixed-effects models with a longitudinal dataset to control for unobserved time-invariant heterogeneity.

The authors estimated the fatherhood premium with five specifications, and each later specification is built on the former one. Model A is the baseline model with only "Number of Children" and no other control. Model B adds the region of residence and urban vs. rural arrangement. Model C adds marital status. Model D adds school enrollment, educational attainment, years of work experience, years of job tenure, job tenure squared, and number of employment breaks. Model E adds full-time/part-time status, union status, firm size, firm locations, industry codes, male occupational education, and proportion male in each occupation from the 2000 Census.

In fixed-effects models predicting log hourly wages, the authors included all the variables selected and used in Model E and added job characteristics from O*NET, including: (1) Level of Competition; (2) Work with Groups or Teams; (3) Exposure to Hazardous Conditions; (4) Work Schedules; (5) Autonomy; and (6) On-the-Job Training. The interaction terms between each of the job characteristics and "Number of Children" are also included.

RESULTS

The authors started with estimations of the fatherhood premium without occupational characteristics. Table 2 shows the coefficients of "Number of Children" in five specifications, as more control variables are added; they include location, marital status, human capital, and job/firm/industry characteristics. The results verified the existence of the fatherhood premium among selected groups of fathers: Model A

shows that the baseline fatherhood premium is around 8.7%. That is, for each child, fathers, on average, receive 8.7% higher wages than do childless men. Including residential location and arrangement increased fathers' wage gain to 10.6% in Model B, which is close to the 13% premium found in Hodges and Budig (2010) when 1979 to 2006 data were used. When marital status was included in Model C, the coefficient of "Number of Children" nearly doubled, at 17.3%. Previous studies have concluded that married fatherhood is associated with significant wage gain (Killewald 2012), and the authors' results confirmed this finding that there is a variation of the fatherhood premium between married and single fathers. When variables of human capital are added in Model D, the coefficient reduced to 5.6%, and when job/firm/industry characteristics are added in Model E, the coefficient reduced to 2.3%, though neither reached acceptable significance level. These results showed that differences in human capital and work-related characteristics explain some of the varation in wage gain between fathers and non-fathers in recent times. The general outcomes are consistent with the previous literature that only selected, not all, fathers may benefit from being parents (Hodges and Budig 2010).

The authors then included the same variables in Mode E and added in occupational characteristics from O*NET; all results are shown in Table 3. The coefficients of "Number of Children" are statistically significant in all models except in Model 1. It shows that each child increases fathers' log hourly wage by 4% to 5%, providing direct evidence on the positive association between fatherhood and incomes. Work context and occupational characteristics further explain the variation in the wage differentials between fathers and non-fathers.

"Schedule Regularity/Inflexibility". As indicated by a negative coefficient, schedule regularity/inflexibility negatively contributes to the predicted log hourly wage across all six models, and greater schedule

Table 2. Results From Fixed-Effects Models Estimating the Fatherhood Premium 1997-2015

Model[a]	Coefficient for number of children	Overall R^2
A: Gross (no control)	.087** (.006)	.285
B: Including location[b]	.106** (.006)	.287
C: Including location and marital status	.173** (.006)	.299
D: Including location, marital status, and human capital[c]	.056 (.006)	.351
E: Including location, marital status, human capital, and job characteristics[d]	.023 (.006)	.424

Notes: [a] All models include person and year fixed effect. Values in parentheses are robust standard errors. * $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed tests).

[b] Measures of location include the region in which respondents resided and whether respondents lived in urban areas.

[c] Indicators of human capital include highest educational level, current school enrollment, total work experience, total work experience unknown, job tenure, job tenure squared, and number of employment breaks.

[d] Indicators of human capital are as same as Model D. Job characteristics included in the model are holding a full-time job, firm size, firm with multiple locations, firm's number of locations unknown, job unionized, union status unknown, industry, occupational education, and proportion of men in the occupation.

Table 3. Partial Results From Fixed-Effects Models Predicting Log Hourly Wages 1997-2015

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Number of children	.003 (.006)	.053*** (.014)	.054*** (.014)	.054*** (.014)	.054*** (.014)	.039** (.015)	.039* (.015)	.038* (.017)
Schedule regularity	-.054** (.018)	-.041* (.018)	-.048* (.018)	-.046* (.018)	-.045* (.018)	-.039* (.018)	-.029 (.019)	-.029 (.019)
Schedule regularity x number of children		-.039*** (.012)	-.038*** (.009)	-.044*** (.010)	-.045*** (.010)	-.064*** (.013)	-.066*** (.013)	-.068*** (.015)
Hazardous exposure	.031*** (.006)	.031*** (.006)	.025*** (.006)	.025*** (.006)	.025*** (.006)	.025*** (.006)	.023*** (.006)	.023*** (.006)
Hazardous exposure x number of children		.001 (.005)						
On-the-job training required			.002*** (.001)	.002** (.001)	.001** (.001)	.002** (.001)	.002** (.001)	.002** (.001)
On-the-job training required x number of children				.001* (.000)	.001* (.000)	.001+ (.000)	.001+ (.000)	.001+ (.000)
Competitiveness					.042*** (.007)	.038*** (.007)	.034*** (.008)	.034*** (.008)
Competitiveness x number of children						.014* (.006)	.015* (.006)	.015+ (.008)
Autonomy							-.016 (.012)	-.015 (.012)
Autonomy x number of children								-.002 (.011)
Teamwork importance							-.038*** (.009)	-.038*** (.009)
Teamwork importance x number of children								.002 (.008)
Overall R^2	.425	.426	.427	.427	.428	.428	.429	.429

Notes: All models include the same variables included in Model E in Table 2—although their coefficients are omitted to conserve space—as well as person and year fixed effects. Values in parentheses are robust standard errors. + $p < .1$; * $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed tests).

inflexibility may result in lower pay. In Model 7 and Model 8, when Autonomy and Teamwork are included, schedule regularity is still negative but no longer statistically significant. It is likely that schedule regularity is confounded with autonomy and/or teamwork; a fixed schedule may provide less autonomy but permit organized teamwork. The significant interaction term between schedule regularity and number of children is negative and becomes more negative after more occupational characteristics are included. This result indicates that the extent to which fathers' wage gain varies with the structure of their schedules; each additional child is associated with a larger wage decrease in more inflexible schedule. In other words, having more children may gradually mitigate the fatherhood wage gain or even reverse the gap between fathers and non-fathers. This result is consistent with the explanation of compensating differentials. Fathers, who share childrearing responsibility with their spouses, desire flexible schedule, and they may be willing to sacrifice some pay to reduce work-family conflicts.

"Hazardous Exposure" positively contributes to the predicted log hourly wage across all models, and more exposures to hazardous conditions may end in higher pay. Men are more likely to work in hazardous conditions (Poston and Bouvier 2017) and take the risk to reap higher financial prizes, regardless of parental status. The interaction term between hazardous exposure and number of children is insignificant, so the extent to which fathers' wage gain does not vary with that number of children that one has. It is an interesting result that risk-taking behavior has no gradient measure; once being exposed to hazardous conditions, these conditions become exogenous, and becoming a parent does not impact the constant exposure. Due to its insignificance, the authors omitted this interaction term in the later models.

"On-the-Job Training" is added in Model 3, and it positively though marginally contributes to the predicted log hourly wage. It shows that more specialized training may translate into higher pay, and this result is consistent with the classic human capital theory (Becker 1993). From the employees' perception, having firm-specific training may serve as an insurance against macroeconomic fluctuations, which may result in unforeseen layoffs. From the employers' perception, having such training may be linked to lower turnover rates. Moreover, it is costlier to replace a worker with firm-specific training; besides the resources and time allocated in the hiring process, the opportunity cost is higher due to resources and time spent on training a new employee. Furthermore, the positive and significant interaction term between on-the-job training and number of children indicates that each additional child is associated with a large monetary prize when more specialized training is obtained. It is likely that specialized training shows determination and perseverance of a worker, and it partially explains the variation of wage gain between fathers and non-fathers. The perspective of productivity and specialization is valid in justifying the fatherhood premium.

"Competition" is added in Model 5, and it also positively contributes to the predicted log hourly wage, which shows more fierce competition may trigger higher pay, holding schedule flexibility, hazardous condition, and skill requirement constant. The reason that these occupations are competitive is exactly that there may be less available talents than available positions in the labor market (Yu and Kuo 2017). When supply is smaller than demand in a competitive market, the equilibrium price, "hourly wage", is higher, as firms bid up the price to game for the limited number of capable and available workers. Competitiveness may explain some of the variation in the fatherhood premium. When fathers focus on work

only, they may be awarded for their commitment, as it is shown that each additional child is associated with a larger wage gain in more competitive occupations.

"Autonomy, Teamwork, and Full Model". In Model 7, occupations emphasizing teamwork pay higher wage, but occupations offering more autonomy show inconclusive result. Model 8 is the full model, and it shows that schedule regularity, on-the-job training, and workplace competition moderate the wage gain of each child for men. However, these moderating effects may be spurious, because current human capital stock and job/firm/industry characteristics are likely associated with these occupational characteristics. For instance, a highly educated father may find on-the-job training easier and more valuable to acquire; with specialized training, this father has better ability to compete for better pay at work.

Overall, the authors' results are consistent with the hypotheses derived from the Productivity and Specialization perspective and the Compensating Differentials perspective. More on-the-job training makes fathers more committed and competitive, and higher devotion and competition result in better pay. Schedule regularity and inflexibility may interfere with family obligations, and fathers may sacrifice some pay in exchange for preferred conditions. These work-related characteristics corresponding to higher wage premium emphasize fathers' work structure and context, human capital accumulation, and work-family conflict.

CONCLUSIONS

Compared to the motherhood penalty, the fatherhood premium is less studied and conclusive. Previous studies, such as Glauber (2008) and Hodges and Budig (2010), focus on the effects of family background and human capital, whereas the authors' primary research goals are to explore the relationship between fathers' work structure and context and their

wage earnings. Since men have limited time and energy, with which they must choose to invest between work and family (Coltrane et al. 2013), the variation of wage gain between fathers and non-fathers may be explained partially by occupational characteristics.

There are three major theoretical frameworks that may explain the variation of the fatherhood premium by structural characteristics of work. The productivity and specialization perspective may award fathers for their autonomous work initiatives, specialized skills and trainings, and ambitious and competitive nature. The family and responsibility perspective may honor fathers for their obligations as decisionmakers and breadwinners, endurance of unfavorable conditions, and commitment for work and family in general. The compensating differentials perspective recognizes the work-family conflict that fathers may sacrifice some pay in exchange for a safe environment, a flexible schedule, and an autonomous management. This study estimated the impacts of occupational characteristics on the variation of the fatherhood wage bonus empirically.

The authors tested a within-gender association among fatherhood, demographic characteristics, and log hourly wage. Their findings indicated that there is a positive fatherhood premium, and such premium is a marriage premium (Magnusson and Nermo 2017) that married fathers enjoy a wage bonus. Residential location and arrangement also explain some variations in the wage gain among fathers; however, human capital shows no significant results alone. Using detailed occupational characteristics drawn from O*NET, the authors found evidence that work structure and context partially explain the variation in the fatherhood premium. Fathers, in general, are advantaged than non-fathers regarding wage and more adapted to workplace demands and pressure. "Hazardous Exposure", "on-the-Job Training", and "Workplace Competition" have consistent, positive effects on male earnings, and each additional child is

associated with a larger monetary gain when more specialized trainings are obtained, or more competitive occupations are held. "Schedule Regularity/Inflexibility" shows negative effects on male earnings, and each additional child is associated with a larger wage decrease in more inflexible schedule. These results are consistent with the hypotheses developed from the perspectives of Productivity and Specialization and Compensating Differentials in explaining the wage gaps between fathers and non-fathers by structural characteristics of work. The perspective of Family and Responsibility does not explain the fatherhood premium empirically.

One limitation of the authors' analyses roots in the data. Since the male respondents are still in their mid-30s in 2015, many of them have yet become fathers (66% of the male respondents are non-fathers). Therefore, the comparison between fathers and non-fathers may not be conclusive. With availability of newer rounds of the longitudinal surveys in the future, the authors would be able to update their results and revisit the theoretical frameworks. Another drawback with the present study is that they cannot determine if the fatherhood premium in certain occupations with harsher conditions or family-friendly conditions is due to personal preferences, selection biases, or employers' treatments. These are unobservable and left in the residual. The current results, therefore, provide the upper bound of the fatherhood premium, and preference variables may further explain the variation in the fatherhood wage gain. Finally, the positive association between fatherhood and income may be due to selection as well. Men, who withstand workplace demand and work-family conflict, may be more likely to get married, have children, and become fathers (Ludwig and Bruderl 2011).

With these results, the authors suspect that there may be a differential fatherhood premium for selected groups of fathers with various occupational characteristics. In terms of work context, the authors tested the impacts of micro-level occupation and macro-level industry but did not include any meso-level class, such as manual and non-manual workers. In terms of demographic variations, the authors did not consider other heterogeneity, such as the one in race and ethnicity, due to the requirement of using time-varying variables in fixed-effects models. With new models, these differences will be tested in future studies.

The fatherhood premium exists for various reasons, and occupational characteristics may only serve as one explanatory mechanism. Other institutional features and policies, such as stress counseling and childcare assistance, may also contribute to the wage differentials between fathers and non-fathers. The conversation of the fatherhood premium as a mirage or a reality carries on.

APPENDIX

Table A1. Weighted Descriptive Statistics of Analytic Sample

Statistic	Mean	SD
Log hourly wages (in cents)	6.87	.95
Number of children	.28	.68
Less than high school	.27	.44
High school	.57	.50
Associate's degree	.04	.19
Bachelor's or more advanced	.13	.33
Currently enrolled in school	.36	.48
North East	.17	.38
North Central	.24	.43
South	.35	.48
West	.23	.42
Urban (vs. rural)	.78	.41
Marriage	.17	.37
Cohabiting	.13	.34
Not in union	.63	.48
Marital status unknown	.01	.02
Years of work experience since age 14	12.70	4.05
Total work experience unknown	.11	.31
Years of current job tenure	1.92	2.32
Number of employment breaks	2.12	1.85
Full-time employed	.62	.49
Part-time employed	.38	.49
Firm without multiple locations	.27	.44
Firm with multiple locations	.44	.50
Firm's number of locations unknown	.01	.08
Job not unionized	.64	.48
Job unionized	.09	.29
Job unionization status unknown	.01	.10
Small (< 30 employees)	.65	.48
Medium (30 to 299 employees)	.25	.43
Large (300 or more employees)	.11	.31
Firm size unknown	.04	.20
Proportion male in occupation (0 to 1)	.64	.26
Occupational education (0 to 100)	43.86	22.43
Agricultural/fishing/hunting/forestry	.02	.12
Mining	.01	.08
Utilities	.01	.07
Construction	.11	.31
Manufacturing-nondurable goods	.03	.17
Manufacturing-durable goods	.06	.23
Wholesale trade	.03	.17

Retail trade	.17	.38
Transportation and warehousing	.04	.19
Information and communication	.03	.16
Finance, insurance, real estate and leasing	.05	.21
Professional, scientific, administrative services	.11	.31
Educational and social services	.05	.21
Health care	.04	.20
Arts, entertainment, and food services	.19	.39
Other services	.04	.20
Public administration and armed forces	.00	.00
Others	.01	.09

Notes: The descriptive statistics are based on the analytic sample, the unit for which is person-year (N = 37,138, from 4,262 respondents). The authors applied the initial weights of each respondent in 1997 survey-round to calculate the mean and standard deviation for each variable.

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Note

1. Detailed information on the matching of the O*NET occupational codes with the NLSY97 occupational codes is available upon request.

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