

Do Employers Prefer Fathers? Evidence from a Field Experiment Testing the Gender by Parenthood Interaction Effect on Callbacks to Job Applications

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Abstract

In research on fatherhood premiums and motherhood penalties in career-related outcomes, employers' discriminatory behaviours are often argued to constitute a possible explanation for observed gender gaps. However, there is as yet no conclusive evidence of such discrimination. Utilizing a field experiment design, we test (i) whether job applicants are subject to recruitment discrimination on the basis of their gender and parenthood status, and (ii) whether discrimination by gender and parenthood is conditional on the qualifications required by the job applied for. We applied for 2,144 jobs in the Swedish labour market, randomly assigning gender and parenthood status to fictitious job applicants. Based on the rate of callbacks, we do not find that employers practise systematic recruitment discrimination on the basis of the job applicants' gender or parental status, neither in relation to less qualified nor more highly qualified jobs.

We know that, in general, men are advantaged over women in the labour market, and that fathers are advantaged over mothers (Charles, 2011). In research on gender differences, fatherhood premiums, and motherhood penalties in the areas of wages and other career-related outcomes, employers' discriminatory behaviours are often argued to be a *possible* explanation of observed gender gaps (Mandel and Semyonov, 2006; Gangl and Ziefle, 2009; Bygren and Gähler, 2012). However, there are no studies showing *conclusive evidence* of systematic employer discrimination. This is because discriminatory behaviours are not identifiable in large-scale quantitative data. While qualitative studies suggest that gender

discriminatory attitudes and behaviours are prevalent among at least some employers (Bekkengen, 2002; Kugelberg, 2006), a sceptic could easily dismiss this as anecdotal evidence, and argue that in quantitative studies, a residual effect of gender, or of gender in interaction with parenthood, might just as easily be a consequence of productivity-related characteristics observed by the employer but not the researcher.

We utilize a field experiment design in which fictitious job applications are sent to real job vacancies (i.e. correspondence testing) to directly investigate whether mothers and fathers are subject to discrimination in the Swedish labour market. By discrimination we mean a negative or

positive bias in the treatment of individuals (over and above any differences associated with objective indicators of their productivity) based on their membership of certain demographic categories, in this case the intersection of gender and parenthood. Our aim is to study whether employers treat parents differently than non-parents in recruitment situations and, if so, whether employer choices vary on the basis of the applicant's gender.

Motherhood Penalties and Fatherhood Premiums

The labour supply of a typical woman decreases when she has a child, both in Sweden (Kennerberg, 2007) and elsewhere (Blossfeld and Drobnic, 2001; Lewis, 2009). For women, both an occupational status penalty (Aisenbrey, Evertsson and Grunow, 2009; Abendroth, Huffman and Treas, 2014) and a wage penalty associated with parenthood, net of, e.g. human capital, work effort, family structure, and job characteristics, have been found in many developed countries (e.g. Joshi, Paci and Waldfogel, 1999 [the United Kingdom]; Harkness and Waldfogel, 2003 [a comparative study of seven countries]; Kennerberg, 2007 [Sweden]; Budig and Hodges, 2010 [the United States]; Simonsen and Skipper, 2012 [Denmark]), although this penalty appears to be relatively small in Sweden (Budig, Misra and Boeckmann 2016 [a comparative study of 22 countries]). In contrast, the typical man continues to work full time, or increases his working hours when he has a child (Gornick and Meyers, 2003 [the United States]; Kennerberg, 2007 [Sweden]), and parenthood has positive effects on men's wages and careers (Hodges and Budig, 2010 [the United States]; Magnusson, 2010 [Sweden]; Bygren and Gähler, 2012, [Sweden]; Simonsen and Skipper, 2012 [Denmark]; Petersen, Penner, and Høgsnes, 2014 [Norway]). Thus, the relative gain from parenthood for men compared to women contributes to the gender wage gap in Sweden, and this gap is larger among parents than among non-parents (Boye, Halldén and Magnusson, 2014).

In theory, motherhood penalties could be both smaller and larger in more qualified occupations. On the one hand, any motherhood penalty should be greater in more qualified jobs, since any reduction in job commitment and productivity, whether real, due to e.g. a (relative) loss in human capital, or only assumed by the employer, and due to e.g. statistical- or status-based discrimination, may be particularly negative for mothers in managerial positions and in highly qualified jobs, where more work effort is required and where high competence and a reliable job presence/job commitment are crucial, as well as overtime, business trips, and the like (cf.

Williams, 2000; Anderson, Binder and Krause, 2003). High turnover rates in these positions may also be assumed to be particularly costly for employers, and to avoid these costs, they may thus avoid hiring married and cohabiting women, mothers of small children, and women 'at risk' of having children (cf., Bielby and Baron, 1986). On the other hand, high-skill and high-wage jobs are often portrayed as being 'good', family-friendly jobs that offer mothers flexible working hours, and the possibility to work from home, which reduces the work-family conflict (Anderson *et al.*, 2003; Amuedo-Dorantes and Kimmel 2005). Employees in low-wage (or 'bad') jobs are more likely to lack irreplaceable skills, and their presence is required at fixed times, thus making the combination of work and family responsibilities more difficult and employers reluctant to hire mothers for these positions (Budig and Hodges, 2010).

Empirically, Swedish studies have shown that the motherhood wage penalty increases with the level of education (Todd, 2001). Moreover, the gender wage gap among parents increases with occupational prestige (Magnusson, 2010) and job qualification level (Boye *et al.*, 2014). Waldfogel (1997) has found that the motherhood wage penalty in the United States increases with the level of education, whereas other scholars have found the opposite or have reported more complex patterns (Todd, 2001; Anderson *et al.*, 2003; Amuedo-Dorantes and Kimmel, 2005). Budig and Hodges (2010, 2014) found that the penalty is higher for women in low-wage jobs, although this finding was recently contradicted by Killewald and Bearak (2014), and comparative studies indicate the motherhood wage penalty to be inconsistently associated with educational level and job skill level across different countries (Todd, 2001; Halldén, Levanon and Kricheli-Katz, 2015).

Do Employers Prefer Fathers?

We know rather little about whether, or how much, employer decisions matter for labour market-related gender gaps following parenthood. If employers know that women, on average, are more constrained by family responsibilities than men, and/or leave the labour market for longer periods, they may statistically discriminate, using this group-level information in their individual-level employment and promotion decisions. This might specifically be the case in societies that, like Sweden, are characterized by family-friendly policies (i.e. long parental leave and/or institutionalized options for parents to work part time) which, due to the traditional gender division of labour, are in practice mainly directed at mothers (cf., Mandel and Semyonov, 2006).

Discrimination might also derive from a cognitive bias operating over and above the actual productivity of groups (cf., Correll and Benard, 2006). Status characteristics involving gender and parental status may be influential in this context. A status characteristic is activated, or becomes salient, when it differentiates between actors or is assumed to be relevant in a particular context. Individuals then use the status characteristic to assign expectations—regarding behaviour, competence, commitment, etc.—that are in accordance with their beliefs about a given status (Wagner and Berger, 2002). Status characteristics appear to be used rather blatantly in the evaluation of mothers' and fathers' parenting skills and job-related competence. American studies based on laboratory experiments have shown that being a parent activates relatively harsh job-related standards for a woman, but relatively lenient standards for a man, indicating the presence of a status-based discrimination mechanism which works to the disadvantage of mothers and the advantage of fathers. Holding formal merits constant, Fuegen *et al.* (2004) found undergraduate student raters to be less willing to hire and promote a mother than a non-mother, but that parental status made no difference in relation to the hiring and promotion of men. Heilman and Okimoto (2008) found that applicants who were mothers were judged (by undergraduate students and people working in the business world) to be less committed to their jobs and less competent, and that they consequently had lower chances of being recommended for a job. Correll *et al.* (2007) found that undergraduate students ranked non-mothers higher than mothers for an executive position; although merits were equal on all dimensions, mothers were penalized on a wide range of measures, including perceived competence. Cuddy *et al.* (2004) found that women who are mothers were presupposed to be more stereotypically female than women who were not mothers, while the flip side of this coin is that mothers were also perceived to be deficient in stereotypically male attributes, such as being agentic, achievement oriented, and in displaying high job competence (Heilman and Okimoto, 2008).

Observing Discrimination

Observing discrimination and disentangling its effects empirically, in real labour markets, is a challenge for research, not least because discrimination appears to be very subtle, occurring more or less subconsciously (Cunningham *et al.*, 2004; Rooth, 2010). As a response to the limitations of using survey data and qualitative data, the popularity of using experimental methods to

study discrimination in the labour market has grown significantly. One common technique for isolating any effects of discrimination is the use of laboratory experiments in which researchers arrange a controlled setting for the study of participant behaviour subject to manipulation. The main shortcoming of this kind of design is that the external validity of such studies can typically be questioned because of the artificial contexts in which they are conducted (Petersen, 2008).

Correspondence testing represents a main type of field experiment used to convincingly measure the extent of discrimination in real hiring processes. In correspondence testing the job applicants exist only on paper, and written, fictitious applications are employed. The advantage of this technique is that its real-world context provides more direct evidence of the level of discrimination by comparison with other methods, while still allowing the researcher a high degree of control. Discrimination is measured based on the relative success of otherwise equally merited applicants.

To our knowledge, only two studies have used correspondence testing to evaluate whether employers discriminate on the basis of parenthood in interaction with gender. In an American study, Correll *et al.* (2007) sent out fictitious job applications to 638 employers (1,276 applications in total, since applications were sent in pairs to each employer) for entry- and mid-level marketing and business job openings published in a Northeastern city newspaper. The general callback rate was low, 4.4 per cent, but for non-mothers, it was more than twice the rate (6.6 per cent) of that for equally qualified mothers (3.1 per cent), which constitutes a statistically significant difference, indicating a motherhood penalty, i.e. employer discrimination against mothers. The general callback rate for men was lower, but whereas the callback rate for fathers (5.0 per cent) was higher than that for childless men (2.8 per cent), the difference was not statistically significant, i.e. a fatherhood premium could not be confirmed. In a French study, Petit (2007) sent out fictitious applications for jobs in the financial sector in and close to Paris. Callback rates were consistently higher among non-parents, but independent of job type or civil/parental status, Petit found no significant difference by gender, i.e. no penalty for women or premium for men. Childless women's callback rates did not differ from childless men's, and mothers' callback rates did not differ from fathers'. It should be noted, however, that the number of job applications was small (157). Nonetheless, the results showed no consistent pattern in either direction.

One limitation associated with both studies, besides the relatively small number of applications, is that they focus only on 'local' effects in two respects. Apart from

the geographical scope being relatively narrow, i.e. a Northeastern city in the United States and Paris in France, the studies also, and more importantly, only included a very limited segment of the labour market, i.e. marketing and business jobs and the financial sector, respectively. In our study we overcome these restrictions by including 18 occupations, thus covering a relatively large part of the Swedish labour market, and by covering different local labour markets.

Empirical Expectations

What might be expected in terms of empirical patterns? As this is a study in which we isolate any effects of the demand side of the labour market, and since the existing knowledge on employer preferences and behaviours regarding the gender and parenthood status of potential employees is scarce, we were open to any kind of result regarding the effect of gender by parenthood on callback rates. If the effects found in studies using survey and register data are to be regarded as indicating the presence of underlying effects of employer choices rather than employee choices, however, we would expect that *fathers should be favoured over mothers*. We base this expectation on the fact that fatherhood has repeatedly been found to have positive effects on wages and careers (Rosenfeld et al., 1998; Hodges and Budig, 2010; Bygren and Gähler, 2012; Simonsen and Skipper, 2012), whereas a motherhood wage penalty has been found in many developed countries (Kennerberg, 2007; Budig and Hodges, 2010; Simonsen and Skipper, 2012; Budig, Misra and Boeckmann, 2016), and motherhood has also been found to be detrimental to the attainment of positions of authority (Hultin, 1998; Rosenfeld et al., 1998). It should be noted, however, that the two previous studies based on correspondence testing exhibit inconclusive results, with Correll et al. (2007) showing the presence of a motherhood penalty in the callback rate in the United States, whereas Petit (2007) found no gender gap in callback rates between mothers and fathers in France. A second expectation is that *the relative advantage of fathers compared to mothers, if any, should be larger for applicants for highly qualified jobs*. Most studies based on Swedish data show that the motherhood wage penalty and the gender wage gap for parents increase with the level of education, occupational prestige, and job qualification level (Todd, 2001; Magnusson, 2010; Boye et al., 2014), although results are far from consistent in and between other societies (Waldfoegel, 1997; Todd, 2001; Anderson et al., 2003; Amuedo-Dorantes and Kimmel, 2005; Boye et al., 2014; Halldén, Levanon and Kricheli-Katz, 2015). Because

few previous studies have been able to isolate the effects of discrimination, none of these expectations are strong.

The Swedish Context

The fact that this study has been conducted in the Swedish context would lead us to expect gender discrimination in general to be low, but there is less certainty regarding the potential discrimination of mothers. Gender attitudes in Sweden are among the most egalitarian in the world (Brandt, 2011), and Sweden has one of the most ambitious dual-earner family policy models in the world, one of the main objectives of which has been to alleviate the conflict between family responsibilities and a labour market career, particularly for women (Gornick and Meyers, 2003). These policies have been very successful in maintaining a high rate of female labour market participation, but there is some debate as to whether they may serve to increase the (statistical) discrimination of women of fertile age and lock women into jobs and sectors with few career opportunities (cf., Mandel and Semyonov, 2006; Korpi, Ferrarini and Englund, 2013). To our knowledge, only two (field) experiments have been conducted to test whether women and men experience different callback rates in relation to job applications in Sweden. Ahmed, Andersson, and Hammarstedt (2013) and Carlsson (2011) report very small gender differences in these rates. Ahmed et al. (2013), however, focused on discrimination based on the sexual orientation of childless applicants, whereas the fictitious applicants in the study by Carlsson (2011) were all relatively young, and parenthood effects—if present—may have been limited by the study design.

Design of the Correspondence Test

To evaluate whether actual employers discriminate by gender and parenthood, we performed a correspondence test and sent fictitious applications for real jobs in the labour market, and recorded the callback rates for these applications. This approach has been successfully applied in a number of previous studies (cf., OECD, 2008; Pager and Shepherd, 2008).

The type of applicant (gender*parenthood status) was randomly assigned to each application using computer software created by Lahey and Beasley (2009). We applied for jobs in 18 distinct occupations (merged into 14 analytical categories): accountant/auditor, assistant nurse, chef, cleaner, elementary school teacher, engineer in computer science/computer specialist, engineer in machine technology/industrial economics/electronics, financial assistant, high school teacher, nurse, preschool

teacher, receptionist, salesperson, and store personnel/cashier. The membership of these occupations is characterized by variation in gender, immigrant composition, educational level, and sector (Ahmed *et al.*, 2013; Bursell, 2014). They are also reasonably typical; of the 18 occupations we apply for, 7 are found among the 10 largest occupations in the Swedish labour market. We categorized the following occupations as requiring post-secondary education: accountant/auditor, elementary school teacher, engineer in computer science/computer specialist, engineer in machine technology/industrial economics, high school teacher, nurse, and preschool teacher.

We found job openings at the Swedish Public Employment Service's (Arbetsförmedlingen) website (Platsbanken), the main arena for job announcements in Sweden. We focused on jobs in and close to the largest Swedish cities (i.e. Stockholm, including the Mälardalen area, Gothenburg, and Malmö) and sent one application for each vacancy. We did this to minimize employer costs in time and effort, to reduce the risk of being detected by the employers, and to avoid the problem of constructing two equally merited, yet non-identical applications. An alternative approach would be to send two or more applications (male/female*parent/nonparent) for each job. An advantage with this procedure would have been that it generates an intra-employer variation in the evaluation of the applicants, and that unobserved employer callback heterogeneity can be netted out in the estimation of discrimination. Since we randomized applicant characteristics to applications, however, applicant characteristics are expected to be orthogonal to any observed and unobserved employer characteristic, and, thus, these should not bias the estimated effect of applicant characteristics.

We define a callback as a non-automatic response by the employer (via e-mail, text, or telephone), which may involve, e.g. offering the job, asking the applicant to come to a job interview, or asking for more information. As our intention with the callback variable is to tap into employer intentions to employ, we treated these as 'callbacks', but the explicitly negative callbacks, and nonresponses, as 'no callbacks'. The applications were constructed based on a two (gender: male vs. female) by two (parental status: parent vs. non-parent) factorial design that included gender and parental status as the between-subject factors. This produces four main groups of applicants. Factors were randomly assigned to each application. All applicants had a Swedish education that was relevant for the job in question. To simplify the construction of the résumés, we set the age for all applicants to 31, which is the median age at first parity for mothers

in Stockholm (Stockholms stad, 2014). We also varied the applications randomly in relation to other characteristics (ethnic background, i.e. foreign-sounding name but identical application in all other aspects, any partner's occupation, age of children and signals on competence, warmth, and work commitment). We condition on these characteristics, along with job type/occupation applied for, employer sector, and quarter of year in which the application was submitted. The estimates from the full models are reported in the Supplementary Table A1.

The applications consisted of two parts. First, a short CV that included the applicant's personal details, such as full contact information (name, telephone number, e-mail address, and postal address) and date of birth, as well as prior work experience and education. Second, an application letter that took the form of a short biography including, among other things, the applicant's name (revealing the gender), age, information about current and previous jobs, qualifications, and an indication of the applicant's civil status and parental status. We consulted Statistics Sweden to find the most common first and last names in Sweden, and in total, we used eight combinations of names (four distinctively female and four distinctively male) for the study. For approximately 20 per cent of the applications, foreign-sounding names were used. These were, in contrast to the Swedish-sounding names, typical Yugoslavian and Middle Eastern names common in Sweden (see online appendix). For half of the applications, we included information that the applicant lives with his/her two children, and for the other half, we gave no information about children. We created e-mail addresses and registered telephone numbers connected to a voicemail for all of the fictive applicants. When the phone number was called, a message was automatically played, informing the callers of the name of the person reached and requesting them to leave a message. In total, 2,144 applications were sent between October 2013 and June 2015.

Results

Do employers prefer fathers? Table 1 presents callback rates by gender, parenthood, and occupation. The overall callback rate is 39.0 per cent, but there is substantial variation between occupations, ranging from 8 per cent for cleaners to 76 per cent for elementary school teachers. For the gender by parenthood interaction, we find a much smaller variation. Childless men have the highest chances of receiving positive callbacks (41.6 per cent), followed by childless women (39.2 per cent), fathers (39.1 per cent), and finally mothers (36.4 per cent).

Table 1. Callback rates by applicant gender, parental status, and occupation

Type(s) of jobs applied for	Number of jobs applied for	Proportion positive response (standard error)				Ratios				
		All	Fathers	Mothers	Childless men	Mothers vs. fathers	Mothers vs. childless men	Fathers vs. childless men	Fathers vs. childless women	Childless men vs. childless women
All occupations	2,144	0.390 (0.011)	0.390 (0.021)	0.364 (0.020)	0.416 (0.022)	0.93	0.88	0.94	1.00	1.06
Store personnel and cashier	138	0.087 (0.024)	0.111 (0.047)	0.055 (0.039)	0.086 (0.048)	0.50	0.64	1.29	1.22	0.95
Engineer industrial economics/machine technology/electronics	104	0.288 (0.045)	0.292 (0.095)	0.322 (0.085)	0.421 (0.116)	1.10	0.76	0.69	1.75	2.52*
Engineer computer science, computer specialist	230	0.587 (0.033)	0.600 (0.067)	0.600 (0.067)	0.541 (0.064)	1.00	1.11	1.11	0.98	0.89
Financial assistant	140	0.179 (0.033)	0.122 (0.052)	0.212 (0.072)	0.333 (0.088)	1.74	0.64	0.37*	1.47	4.01*
Preschool teacher	230	0.674 (0.031)	0.579 (0.066)	0.650 (0.062)	0.661 (0.064)	1.12	0.98	0.88	0.72**	0.82
Elementary school teacher	119	0.756 (0.039)	0.857 (0.060)	0.655 (0.090)	0.786 (0.079)	0.76	0.83	1.09	1.22	1.12
High school teacher	85	0.518 (0.055)	0.471 (0.125)	0.518 (0.098)	0.579 (0.116)	1.10	0.89	0.81	0.94	1.16
Chef	233	0.317 (0.031)	0.423 (0.069)	0.236 (0.058)	0.400 (0.067)	0.56*	0.59	1.06	1.77*	1.67
Cleaner	168	0.077 (0.021)	0.045 (0.032)	0.103 (0.057)	0.024 (0.024)	2.29	4.29	1.88	0.34	0.18
Receptionist	121	0.207 (0.037)	0.172 (0.071)	0.171 (0.059)	0.320 (0.095)	0.99	0.53	0.54	0.90	1.67
Accountant and auditor	200	0.390 (0.035)	0.352 (0.065)	0.380 (0.069)	0.400 (0.074)	1.08	0.95	0.88	0.82	0.93
Salesperson	171	0.392 (0.037)	0.472 (0.084)	0.326 (0.070)	0.388 (0.070)	0.69	0.84	1.22	1.18	0.97
Nurse	94	0.628 (0.050)	0.828 (0.071)	0.522 (0.106)	0.619 (0.108)	0.63*	0.84	1.34	1.74**	1.30
Assistant nurse	111	0.270 (0.042)	0.111 (0.062)	0.216 (0.069)	0.312 (0.083)	1.95	0.69	0.36	0.19***	0.52

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.

Note: The reported significance tests in the right-hand panel are two-sample tests of difference in proportions.

Thus the largest difference in callback rates, between childless men and mothers, is 5.2 percentage points, and the ratio between any two of the categories of gender*parenthood varies between 0.88 and 1.07. We would argue that these differences are substantively modest, given the magnitude of the overall callback rate. Moreover, none of these group differences is statistically significant at conventional levels, indicating no (or weak) evidence of employers disfavouring mothers or favouring fathers or, in fact, any of the other categories based on the gender*parenthood combination. The *P*-value for the difference in proportions that comes closest to reach statistical significance is that between childless men and mothers, and it is equal to 0.083.

A majority, 54 per cent, of the callbacks included an invitation to an interview or a meeting, in 28 per cent, the employer wanted to get in touch, in 13 per cent, the employer just asked for more information, and in 5 per cent of the callbacks, the employer called but left no message. We checked whether any group received higher-quality callbacks, e.g. invitations to interviews rather than just requests for more information, but no such systematic quality differences could be observed (Supplementary Table A2). Patterns differ quite substantially between occupations, but it is hard to tell whether these differences are due to sampling variation or to real differences between occupations. Fathers are favoured over mothers when they apply for jobs as store personnel/cashiers, elementary school teachers, chefs, salespersons, and nurses, but mothers are favoured over fathers for jobs as financial assistants, cleaners, and assistant nurses. In general, the fathers/childless women ratios and the mothers/childless men ratios follow patterns that are similar to those for fathers/mothers.

Figure 1 presents a graphic of callback rates by job applicant characteristics in terms of gender and parenthood status. We have already noted that parenthood has a negative effect for both women and men with regard to their chances of receiving a positive employer response to

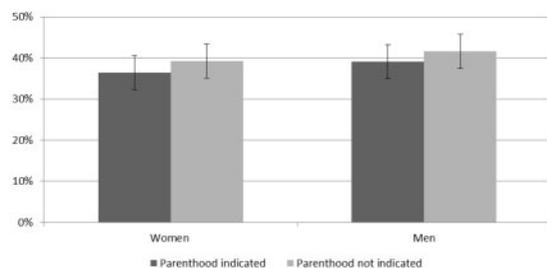


Figure 1. Employer callback rates by gender and parenthood status of applicant. 95 per cent confidence intervals

their job applications. Childless men seem to be favoured over other categories of applicants but, as can readily be seen from the substantial overlap of confidence intervals, none of the between-group differences in callbacks are statistically significant. More detailed results are displayed in Table 2, where we present the linear probability regression estimates on which Figure 1 is based (see Model 1). If a coefficient is multiplied by 100, we get the percentage point change associated with a unit increase in the independent variable. It can be noted that the *R*-squared value in Model 1 is very close to zero. That is, gender, parenthood, and its interaction have close to zero predictive value for employer responses to job applications. To ensure that the results are not due to randomly generated differences in the assignment of gender and parenthood to the occupations applied for, we have also added occupation fixed effects in Model 2. As can be seen, the estimates remain unaffected.

In Figure 2, we turn to an analysis of whether there are differences in callback rates by parental status depending on the qualification level of the job, i.e. on whether post-secondary education is usually required for the job being applied for. We find a tendency for employers to prefer childless applicants over parents in relation to less qualified jobs, whereas parenthood does not seem to matter much in relation to the more highly qualified jobs. However, as before, it should be noted that with the exception of the general difference in callback rates between more highly and less highly qualified jobs (over 50 per cent versus around 20 per cent), the differences in callback rates by parental status are neither substantive nor statistically different from zero at conventional significance levels. This can again be seen in Table 2, which also shows that the results are only marginally affected when we condition on occupation and the other controls.

Finally, we tested whether our results differed across different sectors, but did not find this to be the case (Supplementary Table A1). The callback rates in the business-type jobs (auditors, accountants, and financial assistants), which constituted the focus of the studies by Correll *et al.* (2007) and Petit (2007), do not differ much from those reported in Table 2. We also used information on the length of time to callback by employers to estimate a hazard rate model, but this analysis did not lead to any change in our conclusions. These analyses are not reported but are available from the authors upon request.

Concluding Discussion

A great deal of research has shown that fathers are advantaged over mothers in the labour market in

Table 2. Regression of employer callback (dichotomous) on parenthood status, gender, and educational requirements of the job applied for

	Model 1	Model 2	Model 3	Model 4
Parent	-0.025 (0.030)	0.006 (0.033)	-0.057 (0.037)	-0.013 (0.040)
Woman	-0.023 (0.030)	-0.020 (0.028)	-0.048 (0.038)	-0.039 (0.037)
Parent × woman	-0.003 (0.042)	-0.021 (0.039)	0.031 (0.051)	-0.007 (0.050)
Highly qualified occupation			0.298*** (0.042)	
Parent × highly qualified occupation			0.036 (0.058)	0.039 (0.056)
Woman × highly qualified occupation			0.055 (0.057)	0.042 (0.055)
Parent × woman × highly qualified occupation			-0.056 (0.080)	-0.030 (0.077)
Controls	No	Yes	No	Yes
Constant	0.416*** 0.022	0.491*** 0.037	0.272*** 0.027	0.492*** 0.037
R ²	0.001	0.189	0.113	0.188
N	2,144			

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.

Note: Linear probability model estimates with robust standard errors in parentheses. The coefficients reported under Model 2 and Model 4 are conditional on the following (indicator) control variables: the job's occupation, the quarter of year in which the application was submitted, the employer's sector of employment (private, public, or other), the applicant's partner's occupation (teacher, engineer, or void), the ages of the applicant's children (1 and 3, 6 and 8, or void), the applicant's stated level of job competence (high or normal), the applicant's stated personality (warm or void), the applicant's name ('foreign' sounding name or 'Swedish' sounding name). In the online appendix, we report all estimated coefficients for these models.

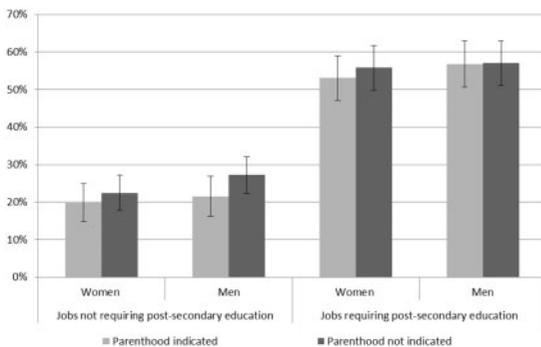


Figure 2. Employer callback rates for combinations of gender and parenthood status of applicant, by educational requirements of the job applied for. 95 per cent confidence intervals

relation to a number of different outcomes. One possible cause of this advantage is employer discrimination. We therefore tested whether employers disfavour mothers and/or favour fathers in the recruitment process, by sending 2,144 fictitious applications for jobs in 14 types of occupation, which cover large parts of the Swedish labour market. Our results neither show any indication

of an average preferential treatment of fathers nor any indication of employer discrimination against mothers. We do find differences between the four categories of gender*parenthood under study, with callback rates ranging from 36.4 per cent for mothers, over 39.1 per cent for fathers, and 39.2 per cent for childless women, to 41.6 per cent for childless men, but these differences are substantively small, and in no case do they reach statistical significance. We are also unable to predict employer callbacks with these factors; the amount of variance that they explain is very close to zero. Correll *et al.* (2007) report a slightly higher, and statistically significant, percentage point difference (3.5) in callback rates between mothers and fathers, but their overall callback rate is much smaller (4.4 per cent). The higher overall callback rate in our study may indicate a higher level of demand for employees and, thus, that employers are less able to discriminate job candidates. However, even when we scrutinize occupations with low callback rates, e.g. cleaner, store personnel, financial assistant, and receptionist, we find no systematic indication of employer discrimination based on gender*parenthood (Table 1).

These results clearly deviate from our first empirical expectation, i.e. that employers should generally favour fathers over mothers. This expectation was based, however, on conventional empirical analyses of wages and careers rather than on recruitment (Hultin, 1998; Rosenfeld *et al.*, 1998; Budig and Hodges, 2010; Hodges and Budig, 2010; Bygren and Gähler, 2012), and on inconclusive evidence from two previous studies based on correspondence testing in societies other than Sweden. We need to be somewhat cautious, however, when comparing our results with these studies. Whereas we study large segments of a labour market, Correll *et al.* (2007) concentrate on marketing and business jobs in a US city, and Petit (2007) studies the financial sector in Paris. Thus, a difference compared to our own results, with Correll *et al.* finding evidence for employer discrimination against mothers, and a similarity with our results, with Petit finding no such evidence, could be due to structural differences and similarities between labour markets in different societies, but it could also be due to methodological differences, such as the choice of occupations for example. We did, however, conduct a sensitivity analysis, in which only occupations in the business sector were included, and found the results not to differ from those reported for other occupations. Thus, a tentative conclusion is that the deviation in results from Correll *et al.* is not due to differences in the occupations studied. Our results are rather in accordance with an alternative empirical expectation of no (or limited) employer discrimination based on gender and parenthood. This expectation is based on the relatively high degree of gender egalitarian attitudes observed in Sweden (Brandt, 2011), a family policy promoting and facilitating mothers' employment (Gornick and Meyers, 2003), and empirical findings in previous experimental studies showing small gender differences in employer callbacks (Carlsson, 2011; Ahmed *et al.*, 2013).

Based on the notion that gender differences are larger in relation to valued outcomes in more skilled jobs, we tested whether discrimination by gender*parenthood exists in jobs requiring post-secondary education. We found no such pattern; again, the differences between our four categories were far from statistically significant at any conventional level. This result also deviates from our empirical expectation, i.e. that employers should favour fathers/disfavour mothers to a higher degree in relation to highly qualified jobs than in relation to less qualified jobs. Again, however, our expectation rested on a weak foundation, since (i) there are no previous results based on experimental data, at least not to our knowledge; (ii) previous studies based on conventional empirical analyses have primarily focused on wages; and

(iii) the results of these studies have been far from unequivocal (Waldfoegel, 1997; Todd, 2001; Anderson *et al.*, 2003; Amuedo-Dorantes and Kimmel, 2005; Halldén, 2011; Boye *et al.*, 2014).

A number of limitations associated with the approach employed in our study should be noted. First, although the number of jobs applied for is larger than in any previous correspondence test of the gender by parenthood interaction (Correll *et al.*, 2007; Petit 2007), we cannot exclude the possibility that with a larger N , the estimated differences might turn out to be statistically significant (cf. Bernardi, Chakhaia and Leopold, 2017). It should be noted that since effect sizes for parenthood and gender, and the interaction between them (see Table 2, Model 2) seem to be small, we would need to increase N substantially to increase precision and avoid making a Type II error. Still, the fact that effect sizes are substantively small tells us that gender by parenthood discrimination, in the event that it does exist, is probably marginal in relation to the case at hand.

Secondly, we have studied the presence of employer discrimination during the hiring process, but discrimination may of course also occur within an organization or a workplace. An employee might, for example, be moved to another position as a result of parenthood, be at a disadvantage in the wage-setting or promotion process, have internal training opportunities withheld, or be subjected to an increased risk of being laid off, but the use of correspondence testing does not shed any light on these types of discrimination.

Thirdly, our findings are limited to jobs that accept written applications which are sent to publicly announced vacancies. This should only be a minor issue in the current context, however, since written job applications are the norm in Sweden. Nonetheless, this does not change the fact that the method employed ignores other channels into employment, such as walk-ins and social networks. Women who become mothers might systematically become excluded from such networks. Still, while we would accept that discriminatory mechanisms may be at work in organizational processes, or as a result of homophily in social networks, the question that would remain to be answered is why such mechanisms are not in play when employers decide whom to contact among otherwise unknown job applicants.

Fourthly, one could argue that the absence of a lower employer callback rate for mothers than for non-mothers does not necessarily imply the absence of a motherhood penalty, the reason being that employers may anticipate 31-year-old women with no children to become mothers in the near future and, thus, treat the applications of these women in a similar way to

applications from mothers. One factor that speaks against this objection, however, is the finding that employers do not seem to prefer men over women more generally. If there were any truth to the statement that employers discriminate against women in fertile ages, regardless of whether they have children, we would observe higher callback rates for all men compared to all women. We do observe such a difference, but it is equal only to 2.5 percentage points, and this difference is very far from being statistically different from zero. Our results rather indicate that employers do not care much about whether prospective employees are men or women, or about their family status.

Fifthly, while our study only captures discrimination at the initial stage of, and not later on in, the hiring process, audit studies show that discrimination is much more common at this first stage, i.e. when selecting applicants for interview (Attström, 2007), than at later stages. Almost 90 per cent of the discrimination against ethnic minorities take place at this initial stage (Allasino *et al.*, 2004; Cediey and Feroni, 2008). Apparently, there is much less discrimination on the basis of gender and family constraints than on the basis of ethnicity, but the pattern, i.e. that most hiring discrimination occurs in the first stage of the process, should be similar (cf., Åslund and Nordström Skans, 2012).

Do these results matter in relation to the research on motherhood penalties and fatherhood premiums in the labour market? In our judgment, they matter a lot. Published studies on these gender gaps include a good deal of speculation about how employers' beliefs and preferences matter in relation to the career development of women and men, before and after they become parents. Most commonly, these studies are based on theoretical models about what employers believe, or do, without any reference to hard empirical evidence. One example is found in the notion of statistical discrimination. Here scholars expect employers to favour or disfavour individual job applicants based on group characteristics, e.g. in the case of females, known or supposed lower average productivity among women and mothers due to their greater family responsibilities and longer periods of labour market absence. This should particularly be the case in societies such as Sweden that have generous parental-leave programmes. As a case in point, Mandel and Semyonov (2006: 1915) have argued that 'in well-developed welfare states where women's eligibility for social rights supports their absence from work, the exclusion of women from jobs which require costly firm-specific investment will be more acute. In labor markets where women as a group are more protected by regulations and legislation, and where they

enjoy social rights that interfere with their work continuity, employers are expected to prefer male workers for positions that require investment in firm specific human capital'. The findings presented here do not confirm these assumptions about employer decision-making in welfare states with ambitious family policies.

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