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REPRODUCING OCCUPATIONAL INEQUALITY:

MOTHERHOOD AND OCCUPATIONAL SEGREGATION

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Abstract

This paper examines how motherhood is associated with occupational segregation, paying careful attention to how motherhood affects labor force withdrawal in ways that may obscure its relevance for occupational segregation. Using data on 11 countries from the Luxembourg Income Study (2000-2007), we find that mothers are more likely than childless women to be out of the labor force and both over- and under-represented in certain occupations. Variation in mothers' occupational segregation across countries is consistent with expectations derived from theoretical arguments about how states reconcile, or fail to reconcile, women's employment and motherhood.

REPRODUCING OCCUPATIONAL INEQUALITY:

MOTHERHOOD AND OCCUPATIONAL SEGREGATION

INTRODUCTION

Family responsibilities associated with marriage and childrearing affect the probability of employment and the wages of women and men across countries. Research investigating the "motherhood penalty" has clearly established that women with children are less likely to work in the paid labor force (Gornick and Meyers 2003; Pettit and Hook 2009) and earn less money than women without children or without young children (Budig and England 2001; Budig and Hodges 2010; Budig, Misra, and Boeckmann 2012; Misra, Budig, and Boeckmann 2011a). At the same time, investigators have found evidence of a "fatherhood bonus." Men with children are more likely to work in the paid labor force and earn a wage premium compared to men without children (Hodges and Budig 2010; Peterson, Penner, and Hogsnes 2011).

In addition to differentials in employment and wages, family responsibilities may segregate mothers and fathers into and out of occupations. Women who have a discontinuous job change, even only a single break in employment, experience a penalty upon return to work in terms of wage and prestige (Felmlee 1995; Fuller 2008), and employment discontinuity is associated with an increased likelihood of women working in female-dominated jobs (Blossfeld 1987). Hakim (1993) argues that family responsibilities encourage women to move into part-time work which is predominantly found in female-dominated industries. In addition, in an audit study Correll, Benard, and Paik (2007) found that employers discriminate at the point of hire against mothers, which would contribute to segregation on family obligations. These studies suggest that family obligations should play a role in occupational segregation by motherhood.

Empirical research, however, finds little evidence that occupational segregation is structured by family obligations either within countries or across them. Several studies conclude that gender inequality in occupations is not systematically related to family obligations in the U.S. or in Germany (England 2005; Roos 1985; Tomaskovic-Devey 1993; Trappe and Rosenfeld 2004). Although family formation events may be associated with job changes, most job change is from one gender-typical occupation to another (Trappe and Rosenfeld 2004).

The effects of motherhood on occupational segregation, however, may be masked by factors associated with motherhood *and* occupational segregation – such as the relationship between education and childbearing or the relationship between education and labor force involvement. There are good reasons to think this may be a valuable area of inquiry as research finds that the extent of the motherhood penalty and fatherhood premium varies by socio-economic status. The motherhood penalty in the U.S. is greatest for women at the bottom of the earnings distribution (Budig and Hodges 2010), and the fatherhood bonus is substantially higher for fathers with other markers of advantage (e.g., college graduates, professional workers) (Hodges and Budig 2010).

Compounding this disparity highly educated women are more likely to postpone or forego childbearing compared to less educated women. Women completing university are more likely than other women to remain childless or to have only one child (González and Jurado-Guerrero 2006). This means that not only are less educated women facing a more severe motherhood penalty, but they are more likely to be mothers and thus subjected to a penalty. Evidence of these inequalities calls for research disentangling the influences of family responsibilities and education on employment outcomes, specifically occupational segregation.

Furthermore, there is reason to believe that these relationships will vary across countries in relation to social and institutional conditions that affect mothers' involvement in the paid labor force and concentration in part-time work. For example, countries have been characterized as supporting "dual-earner" families through generous childcare provisions or "earner-carer" configurations through generous parental leave (Gornick and Meyers 2003). These types of family policy configurations can have both direct and indirect effects on mothers' occupational location. Dual-earner configurations enable mothers to work full-time in the paid labor force while their children are cared for by others, making it possible for mothers to work in a variety of occupations and industries including those that are primarily composed of full-time workers. Earner-carer configurations may indirectly affect mothers' occupational location by influencing labor supply. Policies that support caregiving in the home, and by women, may lead to lower employment rates among mothers which may influence occupational segregation.

In this paper we consider how motherhood is associated with women's occupational location across 11 countries to explore two primary questions. Are women occupationally segregated by motherhood and does this vary by educational attainment? Do these relationships vary across countries and in ways patterned by how countries attempt to reconcile women's employment and childrearing? Consistent with a growing body of research documenting the motherhood penalty for other labor market outcomes, we find that that motherhood is associated with occupational segregation among women. Moreover, the association between motherhood and occupation varies across countries in relation to how social conditions concentrate caregiving in the home and in the hands of women. For example, in many one-and-a-half earner countries mothers are both more likely to be out of the labor force and over-represented in less desirable occupations.

FAMILY RESPONSIBILITIES AND GENDER INEQUALITY IN ECONOMIC OUTCOMES

Explanations for gender differences in the effects of family responsibilities emphasize how time and related demands associated with having children exact "costs" to the household and lead at least one household member to reduce work effort in the paid labor force in order to manage domestic responsibilities. Research suggests that women dilute and men intensify their work effort with increasing family responsibilities. Mothers or potential mothers may seek jobs that offer non-monetary benefits, or compensating differentials, such as a lower penalty for discontinuous employment, flexibility, or part-time opportunities (Filer 1984; Jacobs and Steinberg 1990; Okamoto and England 1999). Conversely, fathers or potential fathers may seek jobs that offer a "family wage" or opportunities for over-time (Peterson, Penner, and Hogsnes 2011). "Family men" would be increasingly concentrated in male-dominated jobs that reinforce and reward gender specialization in the household and "family women" would be increasingly concentrated in female-dominated jobs that enable them to balance work and family demands.

Alternatively, the cause of occupational segregation by family responsibilities may rest in decisions of employers. This argument contends that employers make decisions about whom to hire, promote, and fire on the basis of their preferences (both conscious and unconscious) for different types of workers. Employers may make decisions on the basis of expectations about productivity, implicit or explicit biases (Padavic and Reskin 2002). Employers may interpret parental status as an indicator of potential productivity, a form of statistical discrimination (Bielby and Baron 1986) assuming women are most productive when not distracted by having a family to care for. Although recent research in U.S. finds no evidence of greater pro-work behaviors on the part of fathers compared to mothers (Kmec 2011), employers' beliefs are key to

this explanation. Another mechanism focuses on how normal cognitive processes bias perceptions, interpretations, and memory in ways consistent with stereotypes (Heilman 1995; Howard and Hollander 1997). In the workplace this selective information processing leads to biases in selection decisions and performance evaluation, as well as self-limiting behaviors among employees (Heilman 1995). Regardless of the specifics, however, the argument implies that employer preferences for hiring and promoting workers is influenced by workers' family obligations (as found in Correll and colleagues' (2007) audit study).

Despite the recent growth in cross-national studies of motherhood and employment outcomes (Misra, Budig, and Boeckmann 2011a; Misra, Budig, and Boeckmann 2011b) and the centrality of motherhood for theoretical accounts of gender segregation in occupations there has been little attention in the cross-national literature to how differences in family obligations may help explain occupational segregation. In addition, previous work on occupational sex segregation has largely focused on the occupational location of women working in the paid labor force, thus conflating labor supply effects with occupational sorting effects. A great deal of attention is paid to how the measurement of segregation influences cross-national accounts of it (e.g., the size of occupational groupings, the level of aggregation, and the construction of the index of segregation) (Charles and Grusky 2004; Jacobs 1999). However, little previous work has considered how gender differences in the influence of family responsibilities on employment across countries might also influence the measurement of occupational segregation. Without paying attention to cross-national variability in how family responsibilities affect labor supply we risk mis-stating their effects (Pettit and Hook 2009).

There are important theoretical reasons to believe that both individual-level factors and country-level conditions influence the effects of family obligations on occupational segregation.

At the individual-level we might anticipate that the effects of family obligations vary by women's capacities to manage competing demands. Some women may be able to reduce the influence of family obligations on work outcomes by outsourcing domestic labor. Hiring domestic help and purchasing pre-prepared meals are more common among highly educated women, among families with high incomes, and among dual-earner families (van der Lippe, Tijdens, and de Ruijter 2004). Recent work by Gupta and colleagues (2010) finds that women in the top 10% of the earnings distribution in Germany, Sweden, and the U.S. do considerably less housework than women in the bottom 10%. Thus, we may expect to see variation by education in the extent to which family responsibilities are associated with occupational segregation because more advantaged women can purchase labor substitutes. In addition, high-level workers often have access to more flexibility than lower-level workers (Golden 2001), adding to their ability to maintain continuous employment even in the face of strong family obligations.

At the country-level we might expect the effects of family obligations to vary by prevailing expectations concerning who cares for children vis-à-vis who works in the paid labor force, and by how countries support workers to manage these work and family demands. Lewis, Campbell, and Huerta (2008) develop a typology of European countries that characterize countries by normative arrangements concerning how families combine employment and the care of children: the one-and-a-half earner, dual full-time, and polarization models. The majority of countries exhibit the one-and-a-half earner model, where full-time employment for fathers and part-time employment for mothers is the most common pattern for two parent families. In the dual full-time model the majority of mothers and fathers work full-time. In a third model, families polarize between dual full-time and male breadwinner families. There is relatively little involvement in part-time work in the latter two models (Lewis, Campbell, and Huerta 2008).

The work patterns that Lewis, Campbell, and Huerta (2008) identify are supported by countries through explicit family policies and labor market regulations (or the lack thereof). For example, high quality, publicly-subsidized child care that matches employees' schedules supports the dual full-time model. Labor market regulations that make part-time employees attractive to employers support the one-and-a-half earner model. Below we connect these models to occupational segregation, focusing on how policies and practices may impact demand for mothers as employees as well as constrain mothers' occupational choices. For example, publicly-subsidized child care not only supports a dual full-time model, but may reduce occupational segregation among women by allowing mothers to remain in occupations requiring full-time hours and decreasing employer discrimination against mothers.

Countries where conditions enable caregivers to devote substantial periods of time to domestic work may generate occupational inequalities primarily defined by family obligations. In this scenario men perform full-time waged work and women combine responsibility for children with part-time employment. For example, Lewis and colleagues (2008) characterize mothers' part-time work as "recognizably *the* way of reconciling work and family" in Germany, the Netherlands, and the UK (p. 25). Part-time employment may pull mothers into female-dominated occupations. The vast majority of part-time work is in found in jobs where employers need staffing flexibility to meet consumer demand, primarily female-dominated service and sales occupations and to a lesser extent elementary (e.g., cleaning) and clerical occupations (Smith, Fagan, and Rubery 1998). To the extent that mothers, more so than childless women, seek out part-time work, they will find themselves in these low-paid female-dominated occupations.

Another mechanism that may create occupational segregation by family obligations under the one-and-a-half earner model is employer discrimination. Expectations for mothers' retreat

from the labor force and primary responsibility for domestic labor should be associated with employer discrimination. This is consistent with research showing that extensive parental leaves or "cash for care" schemes are associated with lower rates of labor force participation among mothers (Pettit and Hook 2005), larger motherhood wage penalties (Misra, Budig, and Boeckmann 2011a), and women spending greater amounts of time on routine household labor (Hook 2010). Direct evidence of employer discrimination is documented by Glass and Fodor (2011) who find that in the context of extensive leave managers in global financial firms employ several strategies to shed or demote Hungarian professional women who become mothers. They contend that state policies that make motherhood salient for employers contribute to these practices (Glass and Fodor 2011). In sum, where expectations for mothers' retreat from the labor market are high, we can expect more discrimination against mothers, particularly in occupations where training or replacement costs are high. This discrimination works in concert with the availability of part-time employment, which is concentrated in occupations where training and replacement costs are typically much lower.

Alternatively, in the dual full-time model where conditions support caregivers to work full-time there may be little differentiation in occupational choice between mothers and non-mothers. In these countries, dual full-time working is the most common employment pattern among couples with children (Lewis, Campbell, and Huerta 2008). Both men and women work, largely full-time, and the government is primarily responsible for the care of children and labor market regulations support relatively short work weeks. These sorts of policies have been associated with higher rates of labor force participation among mothers (Pettit and Hook 2005), lower motherhood wage penalties (Misra, Budig, and Boeckmann 2011a), and women spending lower amounts of time on domestic labor (Hook 2010). Expectations for mothers' continuous

labor force attachment and fewer hours required from "ideal workers" should be associated with less occupational sorting by motherhood. Employer discrimination against mothers should be attenuated because mothers have access to stable childcare arrangements (center care is less likely to "break down" than other arrangements (Williams and Boushey 2010)) and mothers can meet the hour requirements of ideal full-time workers. To the extent that mothers are able to maintain full-time employment, they should be no more likely than childless women to be pulled into female-dominated occupations. The central axis of stratification is more likely to be about gender and education rather than family. This portrait is consistent with research that finds high levels of sex segregation in dual-earner countries, such as Sweden. Strong horizontal segregation (Charles and Grusky 2004) and segregation in field of study are consistent with the ability to indulge "gendered selves" in more economically developed countries (Charles and Bradley 2009). Our focus is on segregation among women by motherhood.

Finally, there is evidence of a third pattern, in which families polarize into either dual full-time earners or male breadwinner families with few families relying on the part-time employment of mothers (Lewis, Campbell, and Huerta 2008). We refer to this as the polarization model. Countries exhibiting this pattern tend to provide little policy support for reconciling motherhood and employment (e.g., unpaid or poorly paid leaves and little state support for childcare) and have small part-time sectors (or large part-time penalties, such as in the United States (Bardasi and Gornick 2008)). In these countries it is likely that occupational segregation will be more strongly determined by educational distinctions than by either gender or family responsibilities. In this scenario solutions are market- or family-based, with caregiving solutions arranged on an individual basis utilizing individual resources (e.g. ability to purchase care, grandparents, staggered work scheduling). Thus in polarized countries we would expect

individual resources to be of primary importance, suggesting that women with more resources would not experience the effects of family obligations as acutely as women with fewer. However, women with more resources may also translate their resources (e.g., partners' income) into time out of the labor force, whereas women with fewer resources may not be able to finance such arrangements. Evidence from the U.S., however, indicates that the positive association between education and employment has increased over time (supporting an opportunity cost or "pull" perspective), whereas the negative association between other income and employment has decreased (showing diminished support for an income effect or "push" perspective) (Cohen and Bianchi 1999). In sum, where supports are few, we can expect substantial heterogeneity in the relationship between motherhood and occupational location arising from heterogeneity in both mothers' resources and employer discrimination. This is consistent with recent work demonstrating that welfare state policies have different effects depending on women's socio-economic position. "Generous family policy" promotes gender equality for women at lower socio-economic levels; ungenerous policy promotes gender equality for advantaged women (Mandel 2011, 2012).

We explore these ideas by examining patterns of women's occupational segregation by motherhood and educational attainment. We expect that associations between motherhood, labor supply, and occupational location will vary depending on country-level conditions and individual investments in labor market skills (proxied by education). We anticipate high occupational segregation between mothers and non-mothers in the one-and-a-half earner model, low occupational segregation in the dual full-time model, and segregation strongly demarcated by educational attainment in the polarization model. How education operates within countries

fitting the polarization model may be linked to the extent to which women with high levels of education use their resources to reduce versus combine full-time employment with motherhood.

RESEARCH STRATEGY

Data

In order to investigate the relationship between work-family models and occupational segregation by motherhood we use micro-level data from 11 countries contained in the Luxembourg Income Study (LIS). LIS is a cross-national data archive containing micro-level data from approximately 40 countries. To facilitate comparative research, LIS harmonizes the datasets into a common template, preserving original country coding, and standardizes data whenever possible to create uniform variable coding across surveys (LIS 2013). LIS has been used extensively to examine women's labor market outcomes (Bardasi and Gornick 2008; Budig, Misra, and Boeckmann 2012; Cooke 2011; Gornick and Meyers 2003; Korpi, Ferrarini, and Englund 2013; Mandel and Semyonov 2005, 2006; Mandel and Shalev 2009; Misra, Budig, and Boeckmann 2011a; Misra et al. 2012; Pettit and Hook 2005, 2009).

In the 11 countries included in our analysis, we have sample sizes ranging from 2,850 to 39,694. Our smallest sample (N=2,850) is drawn from combining two surveys. Although the total sample size of those surveys is 15,901, restricting our analysis to women aged 25 to 49 generates a pooled sample of 2,850. Even with this relatively large sample, occupational segregation by sex, education, and motherhood results in small cell sizes (or small Ns) in many major occupational categories. Despite this limitation, we believe the LIS is the best available data to answer our research questions. While longitudinal studies, such as the EU-SILC, may enable us to answer other related questions, the sample size (12,250) of its largest data set is smaller than the smallest data set we use from LIS. The cross-sectional nature of LIS means,

however, that we cannot observe job changes or spells out of the labor market, important issues that we consider further in the discussion.

We focus on European and Anglo countries because they have been used to develop the theories about states, markets, families and gender inequalities that we reference in this paper. We select countries with the necessary data and anchor our analysis at LIS Wave 6 (2004-2006) and bring in supplemental data from Waves 5 (~2000) and 7 (~2007) to increase sample size in some countries. Eleven high income countries, plus Israel and Taiwan, are available for inclusion. We omit Israel and Taiwan for conceptual and comparability issues.[1] The data were collected from 2000 to 2007 in the following countries and years: Denmark (2004), Finland (2000, 2004), France (2000, 2005), Germany (2000, 2004), Greece (2000, 2004), Ireland (2000, 2004), Luxembourg (2000, 2004), the Netherlands (2004), Spain (2004, 2007), the United Kingdom (2004), and the United States (2004). We limit the sample to women aged 25 to 49 years old. Sample sizes range from 2,850 women in Luxembourg to 39,694 women in the US. Table 1 shows the 11 countries. Although our sample selection is limited by data availability, these 11 countries help us to illustrate general patterns.

Some LIS data sets do not have all the information that we need in order to classify them into the earner/carer typology. Thus, we use Lewis and colleagues' (2008) published data and earner/carer typology, which allows us to retain countries we would otherwise not be able to categorize (e.g., Denmark) due to a lack of data on or data quality issues with the part-time status variable in LIS. We add to Lewis and colleagues data by adding the United States and Luxembourg, calculated from LIS data. Years and sample sizes refer to the LIS data used in this analysis. France is an ambiguous case in Lewis and colleagues' typology, so we assign it to the

dual full-time model because it is most similar to this category. In Table 1, countries are

organized by the percentage of male sole earners.

[INSERT TABLE 1 ABOUT HERE]

Measures

To illustrate cross-national variability in the relationship between parenthood and

occupational segregation, we rely on the International Standard Classification of Occupations

(ISCO-08) coding of occupations, which groups occupations into 10 major categories (ILO

2012). The standardization of occupations was performed by LIS. We focus on eight major

categories including seven occupational groupings and an eighth category indicating that the

respondent was not in the labor force at the time of the survey (NILF). Occupational groups

include: (1) managers, (2) professionals, (3) technicians and associate professionals, (4) clerical

support workers, (5) sales and service workers, (6) production workers, and (7) elementary

occupations. Elementary occupations include jobs such as cleaners, laborers, food preparation

assistants, street vendors, and refuse workers. We collapse two ISCO categories (1) craft and

related trades workers and (2) plant and machine operators, and assemblers into "production."

There are too few women in these occupations to analyze separately and little variability across

countries. We omit two ISCO categories because there are too few women in these occupations

to conduct meaningful analysis: (1) skilled agricultural, forestry and fishery workers and (2)

armed forces occupations.

Consistent with ILO definitions, persons are considered employed even if they are on

leave, including maternity or parental leave, but plan to return to work. We can verify that those

listed as on leave are coded as employed and have a reported occupation in Ireland, the UK,

Greece, Spain, and the US. According to LIS User Support, Germany is a special case where

respondents on leave were asked additional questions about plans to return to their job.

Depending on this information, they were coded as employed or not employed. Only 20.1% have

a listed occupation. Overall, 3.8% of all women are listed as on leave and are missing

information on occupation. In Denmark, those on leave are coded as not employed and have no

information on occupation (0.6% are listed as on maternity leave). Thus, in Germany and

Denmark NILF may be overestimated. There is no leave variable for Luxembourg, Netherlands,

Finland, and France. Women in these countries on leave but still linked to their employer should

be coded as employed. The existence of irregularities in Germany and Denmark, however, raises

the possibility that NILF may be over-estimated in these four countries as well.

If we mischaracterize mothers who plan to return to work in these countries as being

NILF we risk over-stating the effect of motherhood on selectivity out of the labor force.

Unfortunately, we do not have data to directly address this concern but we suspect that this does

not pose a fundamental challenge to our results or our interpretation of them for three primary

reasons. First, the percentage of mothers on leave at any given time is relatively small although

it is higher in countries with lengthy leave entitlements. In the countries affected, the proportion

of employed mothers with a child under age 1 on leave varies from a high of 76% in Finland to a

low of 24% in the Netherlands, with Germany and France in between at 65% and 36%,

respectively (OECD 2012). While it is the case that we are likely to over-estimate NILF more in

Finland than in the Netherlands (if, in fact these countries do not follow LIS/ILO coding

conventions for workers on leave), given the small number of women on leave at any given time

it is unlikely to bias our results in a systematic way. Second, our results regarding patterns of

mothers' labor force participation are consistent with published estimates (OECD 2012). Third,

we can conduct sensitivity analysis for the coding of leave in countries with leave data. We

recoded employed women on leave to NILF. We found small differences and no changes in statistical significance comparing mothers to non-mothers. Recoding those on leave to NILF affects childless women as well as mothers. Employees are on leave for reasons other than maternity or parental leave (e.g., illness/disability). In sum, the leave group appears to be heterogeneous and not concentrated in ways that lead us to think it should bias our results.

We stratify our analyses by parental status and educational attainment. We distinguish women living with their own children (biological, adoptive, or step), who we refer to as mothers, from women not living with own children, who we refer to as non-mothers or childless women. The data do not allow us to distinguish if women have children who do not reside with them. Thus, some women in our sample who we code as non-mothers may have children not living with them or grown children. This is likely to lead to a more conservative estimate of the association between motherhood and occupation. The percentage of women aged 25-49 not living with children ranges from 18.9% in Ireland to 35.1% in Finland. Education is coded, by LIS, as high if the respondent completed tertiary education (level 5 or 6 of the International Standard Classification of Education (ISCED) 1997). The percentage of highly educated women ranges from 24.8% in Luxembourg to 44.6% in Finland, as shown in Table 1.

Analysis

We begin with a summary measure of occupational segregation. We use Duncan & Duncan's (1955) dissimilarity index, a summary measure of segregation, which can be interpreted as the proportion of a group that would have to change occupations to integrate with the other group (implemented with the "duncan" ado file for Stata written by Ben Jann). The formula for D for within sex segregation by motherhood is .5 multiplied by the sum (over all

occupations i) of the absolute value of (mothers in occupation i/mothers) - (non-mothers in occupation i/non-mothers).

The index of dissimilarity is informative, but does not tell us about which occupations mothers are over or under-represented in. For this we use logistic regression predicting the likelihood of being in an occupation compared to all others. We run regressions separately for each country and for women with high and less than high levels of education, producing an odds ratio for each country-occupation-education combination. We report the odds of employment in an occupation among women with children in the home compared to women without children in the home. The odds ratio indicates the over- or under-representation of women with children in a given occupation compared to childless women. One indicates equal representation, less than one indicates that mothers are under-represented, and greater than one indicates that mothers are over-represented compared to women without children in the home. We also note where odd ratios are calculated on a small number of women. With 60 incumbents in an occupation further divided by parental status, there are often few women on one side of the equation. Among highly educated women small cells are most common in production and elementary occupations. Small cells are also common in management.

Odds ratios have the advantage of standardizing the size of occupations, both within and across countries. Odd ratios, however, indicate relative difference. For comparison, we provide absolute difference, in percentage points, in Appendix Table 1. We choose logistic regression over multinomial logistic regression because we want odds ratios that are not in reference to a particular omitted occupational category, which unnecessarily complicates interpretation.

We examine the conditional relationships between motherhood, education, and occupation by country. We include a limited set of controls for age, partner status, and partner

income. Partner status is coded to one if the respondent is living with a partner; 79.0% of

respondents live with a partner. Partner income is measured by partner's labor market income

converted to a percentile. Respondents without a partner or with partners with no labor market

income are coded to the first percentile. Models include partner income squared to capture non-

linearity. Although LIS data does allow us to further refine motherhood by the number and ages

of children more complex analyses using occupational groupings are not feasible with these data.

Models cannot be estimated because of insufficient variation vis-a-vis cell sizes.   Although we

have relatively large data sets, strict occupational segregation -- by education, gender, and

motherhood -- leads to small cell sizes. Even in our largest dataset, the U.S. (N = 39,694), there

are only 56 highly educated childless women working in elementary occupations. This dataset is

14 times as large as our smallest, Luxembourg, which combines data from two surveys to

increase its sample size. A central issue is that childlessness varies between 18 and 35% in our

11 countries. Once we divide the number of childless women by education and then further by

eight occupational categories (of unequal size), we are left with many occupation-education-

motherhood combinations with few incumbents (Table 2 indicates each occupation-education

combination with fewer than 60 respondents).   Future work employing multivariate analysis

with eight occupational categories may be possible (potentially by pooling multiple years of the

largest surveys -- the U.S., Denmark, and U.K.), but will not be able to examine the number and

range of countries included here (using LIS mid-2000s data).

Multivariate regression analyses using LIS to examine women's employment outcomes

have primarily focused on outcomes that are binary (e.g., employed) or continuous (e.g., hours

and wages) (Bardasi and Gornick 2008; Budig, Misra, and Boeckmann 2012; Cooke 2011;

Gornick and Meyers 2003; Korpi, Ferrarini, and Englund 2013; Mandel and Semyonov 2005,

2006; Mandel and Shalev 2009; Misra, Budig, and Boeckmann 2011a; Misra et al. 2012; Pettit

and Hook 2005, 2009). Korpi and colleagues (2013) used LIS data to examine occupation, but

only focused on management. Pettit and Hook (2009) modeled three occupational categories --

management, professional, and clerical, sales, and service -- utilizing logistic regression

comparing the probability of being in a particular occupation versus all others. Neither, however,

examined the interaction between motherhood and educational attainment and neither examined

the full range of occupational categories.

The percentage of women not in the labor force varies from 17.0% to 42.2% across these

eleven countries. Research is generally focused on only those in the labor market; those not in

the labor force are unobserved. When we examine only the employed, we are getting a select

group of women, and how these workers are selected into the labor market varies across

countries. It is precisely because mothers are so select in some countries they appear to do well.

Our approach is more revealing of the relationship between family structure and occupational

segregation, which we do not fully observe if we exclude those not in the labor force.

Supplementary Analysis

The research design describes patterns of segregation by motherhood across countries,

occupations, and levels of educational attainment. It does not, however, quantify the variability

in these associations across countries. Thus, we use multilevel models to document this

variability. Similar to the main analysis we run a logistic regression for each occupation-

education combination. In this model, however, we pool all countries and allow for a random

intercept (model 1) and a random coefficient for motherhood (model 2). In all cases the

likelihood ratio tests reveals that a random slope for motherhood is preferred. There is

variability in the association of motherhood with occupational location across countries. Across

sixteen models (8 occupations x 2 educational levels) the Median Odds Ratio (MOR) averaged 1.76, with a range from 1.37 (Professional – high education) to 2.03 (Association Professional – medium/low education). The larger the MOR, the more important country is for understanding the individual probability of employment in an occupation. One way to interpret the MOR is that if a woman moves to another country with a higher probability of employment in an occupation, her odds (in median) of employment in the occupation increase 1.76 times. Another way to interpret the MOR is in reference to individual-level coefficients. A MOR of 1.76 is similar to the average impact of motherhood across countries on being NILF among women with medium/low levels of education (OR=1.88). Future research utilizing a larger sample of countries could model this variability using multilevel models with country-level variables.

RESULTS

Motherhood is an important dimension of occupational segregation. Mothers are simultaneously more likely to be out of the labor force and both under- or over-represented in particular occupations. That is, mothers are more strongly selected out of and into some occupations than others. There is variability in the relationship between motherhood and occupational segregation both across countries and by educational attainment, which aligns with our expectations derived from considering the conditions families face in different country contexts. Where conditions enable mothers to devote substantial time to caregiving, such as in one-and-a-half earner countries, we see occupational inequalities cluster around motherhood. In dual full-time earner countries where conditions enable mothers to compete in the paid labor force we see less differentiation. Finally, in countries fitting the polarization model, where there is generally meager provision for reconciling work and family, we see patterns diverge acutely by educational attainment.

Sex segregation in occupations is pervasive across countries. A summary indicator of segregation, D, ranges from .32 to .45 (shown in Table 1, column A). Even with only 8 occupational categories, including a separate category for those not in the labor force (NILF), the average across the eleven countries is .38, indicating that, on average, 38% of women would need to change occupational category to integrate with men. Column B is similar to column A, except we restrict the sample to employed men and women, which is the standard approach to calculating D. On average, D declines slightly. In all countries sex segregation is less extreme among those with high educational attainment compared to those with lower attainment (results not shown). This is consistent with research showing greater desegregation in the professions than in working class occupations (England 2005).

There is not clear evidence of different levels of segregation on D across work-family models. No model does "best" on this measure. We find a higher than average score in Finland and France consistent with research showing that countries ranking high in female labor force participation often rank high in sex segregation (Charles and Grusky 2004).

[INSERT TABLE 2 ABOUT HERE]

Turning to segregation among women by motherhood, the central focus of our inquiry, we find much lower levels of D across countries. In fact, D for motherhood is approximately half of D for sex. Column C shows that D for motherhood ranges from .06 to .36. with an average of .18 indicating that 18% of mothers would need to change occupational category to integrate women by motherhood. The correlation between D for sex segregation and D for segregation among women by motherhood is not statistically significant. Unlike sex segregation, patterning by educational attainment is not consistent across countries.

Column F is more similar to what studies of occupational segregation typically do -- examine only women in the labor force. When we restrict to those in the labor force we reduce D by motherhood, on average, by about one-third, from 18% to 11%. The average reduction (shown at the bottom of column G), however, conceals wide variability in the reduction of D across countries. The effect of selection into the labor market on D varies from -4.7% (excluding NILF actually increases D) to 60.4% (excluding NILF reduces D by more than half).   In no country is segregation by motherhood fully explained by mothers' decreased probability of employment. The correlation between D for motherhood including and excluding NILF is .93 (p<.001). Because patterns may be obscured when we select on employment, we explore segregation among all women (column C).

D is a useful measure of overall segregation – by sex and by motherhood. It helps us see very broad patterns across countries or across occupations. However, in order to better illustrate how and where mothers are over/under-represented in occupations we present odds ratios (OR). Table 3 shows only statistically significant ORs across the eleven countries and by educational level, separately for each of the eight occupations. The top row of Table 3 illustrates that highly educated mothers in Ireland are strongly selected out of paid labor compared to their childless counterparts. That is, mothers are over-represented among highly educated women not in the labor force, with an odds ratio over 7. This is reflected in their under-representation in managerial and professional occupations. Even though they are under-represented in the labor force, they are no less likely to be in associate professional, clerical, production, service & sales, or elementary occupations. The second row of the table shows that low to medium educated mothers in Ireland are also more likely to be out of the labor force than their childless counterparts. They are under-represented in management, associate professional, and production

occupations, but are no less likely to be in professional, clerical, service & sales, or elementary occupations. Table 3 shows wide variability in both the level of mothers' segregation into the labor force and into or out of specific occupations.

[INSERT TABLE 3 ABOUT HERE]

On average, regardless of educational level, mothers are more likely to be out of the labor force than are childless women. Mothers are under-represented in the labor market in 18 of the 22 country-education combinations. Exceptions are highly educated mothers in Luxembourg, France, Denmark, and Greece, who are no more likely to be out of the labor market than their childless counterparts. Because so many mothers are out of the labor force, they are under-represented in many occupations. To understand whether mothers are positively or negatively sorted into occupations, we refer to particular occupational groups as "better" or "good" and others as "worse" or "bad." We do this based on wage information and the distribution of workers by educational level in each occupational category. For highly educated women, negatively sorted means over-representation in clerical, production, sales and service, or elementary occupations or under-representation in management, professional, and associate professional occupations. For lower educated women, we move clerical and production occupations from bad to good. Mothers are more heavily selected out of the best occupational categories. Table 3 shows that across the 22 country-education combinations, mothers are under-represented in management in 8 countries, professional in 11, associate professional in 10, clerical in 10, production in 5, sales and service in 0, and elementary occupations in 1.

Even though mothers are nearly universally more likely to be out of the labor force compared to childless women, they are rarely selected out of sales and service or elementary occupations. In fact, mothers are *over-represented* in elementary occupations in 5 of the 22

combinations and over-represented in sales and service in 3, production in 2, clerical in 1, and

associate professional in 1. They are never over-represented in professional or and management

occupations. There is considerable variability, however, in these patterns across countries.

To illustrate the central features of the data we construct a figure that plots the ORs of

women with high levels of education against the ORs of women with low or medium levels of

education. To orient readers Figure 1 illustrates two hypothetical scenarios. (1) If parental status

was not associated with labor force outcomes all occupations would cluster tightly on

intersection of one and one - there would be no difference in occupational location comparing

mothers to women without children, either among women with high or lower levels of education.

(2) If parental status was only associated with labor supply "not in the labor force" (represented

by "NL") would appear in the upper-right hand quadrant indicating mothers of both educational

levels are over-represented among women out of the labor force. All other occupations would

cluster tightly somewhere in the lower-left hand quadrant indicating mothers of both educational

levels are under-represented in all occupations compared to childless women of the same

educational level. Mothers' under-representation would be roughly equal across occupations.

[INSERT FIGURE 1 ABOUT HERE]

Consistent with expectations, in the one-and-a-half earner model there is strong selection

of mothers out of the labor market and negative occupational sorting. This pattern is illustrated

by Germany in Figure 2. Figure 2 uses data from Table 3 to plot odds ratios. ORs that are not

statistically significant are coded to 1 and the circles represent the size of the occupation (i.e., the

percentage of women in each occupational category including NILF). Germany shows strong

selection of mothers out of the labor market and strong sorting across occupations. Mothers are

under-represented in the best occupations and over-represented in the worst compared to their

childless counterparts. German mothers are over three times as likely to be out of the labor force as are non-mothers (all ORs have been top-coded to 2.0 in Figure 2). Both highly and lowly educated mothers are over-represented among those NILF and under-represented in management and professional occupations. Lower educated mothers are also under-represented in associate professional and clerical occupations. Despite their vast under-representation in the labor market, lower educated mothers are over-represented in elementary occupations and higher educated mothers are over-represented in production occupations compared to non-mothers.

Luxembourg and the United Kingdom display a very similar pattern, including the over-representation of lower educated mothers in elementary occupations (see Table 2). In Luxembourg elementary occupations is the most common occupational category for lower educated mothers, whereas clerical occupations is the most common category for non-mothers with similar levels of education. Note that models for highly educated women in Luxembourg are based on sparse data. Among countries in the one-and-a-half earner model the Netherlands is one exception to the general pattern. Highly educated mothers are not negatively sorted and although the OR on NIFL is 2.36 very few highly educated women, regardless of motherhood status, are out of the labor force (i.e., this is one case where the OR is high because the values are low). Appendix 1 shows the percentage point difference is 6.1 compared to 13.4 to 29.3 for other country-education combinations.

Among countries in the dual full-time model France and Denmark show less selection and little or mixed occupational sorting. As shown in Figure 2, France comes close to approximating panel 1 of Figure 1. For women of both educational levels labor supply (NILF) and occupations cluster closely to the intersection of 1 and 1, revealing little evidence that motherhood affects labor supply or occupational location. For mothers with high levels of

education there are no statistically significant differences in labor supply or occupational category compared to childless women. Mothers with low to medium levels of education are more likely to be out of the labor force (OR = 1.43) but are not negatively sorted into or out of occupations. For highly educated women, France represents a country where parental status is not associated with employment or occupation. Highly educated mothers in Denmark are no less likely to be in the labor force and show mixed occupational sorting. They are over-represented in associate professional occupations, but under-represented in clerical and elementary. Lower educated mothers in Denmark are slightly more likely to be NILF (OR = 1.15), and are slightly under-represented in better occupations (associate professional and clerical) and over-represented in sales and service. ORs, however, are relatively low.

Inconsistent with our expectations, highly educated mothers in Finland are strongly selected out of the labor market and there is mixed occupational sorting (mothers are under-represented in professional and clerical occupations). They are over-represented in elementary occupations, but this reflects the rarity of elementary occupations for highly educated women in Finland (0.30% of childless women compared to 0.73% of mothers). Mothers with low to medium levels of education are sorted out of the labor market to a lesser degree (OR = .185) and are sorted out of better occupations -- professional and clerical.

[INSERT FIGURE 2 ABOUT HERE]

Countries in the polarization model are diverse, but all show patterns that diverge by educational attainment either in level of selection or nature of occupational sorting. Overall, they *generally* exhibit moderate to low levels of selection and minimal or negative sorting on occupation. In both Greece and Spain, highly educated women are minimally sorted (though mothers are more selected in Spain), whereas lowly educated women are negatively sorted and

moderately selected. In contrast, in the US mothers at both educational levels are negatively sorted and highly educated mothers are more select than less educated mothers, compared to their childless counterparts. As shown in Figure 2, in the US lower educated mothers show less selection out of the labor market than highly educated mothers, and both are negatively sorted on occupations. Highly educated mothers in the US are less likely to be in management, professional and production, but more likely to be in sales and service. Lowly educated mothers are under-represented in management, associate professional, and clerical occupations, but are just as likely to in sales and service and elementary occupations. The US is the only country to display this specific pattern, but all countries in this cluster show differences by educational attainment.

Table 4 summarizes results and shows variability by how motherhood affects the likelihood of employment (highly, moderately, or not selective) and how mothers are sorted across occupations (minimally sorted or mixed versus negatively sorted). The majority of one-and-a-half earner countries cluster in the lower left as highly selective and negatively sorted. France and Denmark, as dual full-time earner countries, cluster in the upper right as not selective and minimally sorted. The countries fitting the polarization model, where families are split between dual full-time and male breadwinner, are demarcated by education and fit a variety of profiles, but in general selection is moderate or low and highly educated women are minimally sorted or mixed. The Netherlands, Finland, and the US stand out as outliers of their groups.

[INSERT TABLE 4 ABOUT HERE]

DISCUSSION

Motherhood is associated with occupational segregation among women, and the relationship varies across countries, often by educational level. Variation across countries in the

association between motherhood and occupational location is largely consistent with hypotheses derived from considering gendered work-family arrangements. Several inconsistencies, however, indicate more complex relationships than this model implies. First we address overall consistencies with the model and then discuss inconsistencies with an eye towards future research.

Where conditions enable women to devote substantial time to domestic work we see occupational inequalities cluster around family obligations. In one-and-a-half earner countries, we observe strong sorting of mothers out of the labor market and mothers are under-represented in the best occupations, yet they are not under-represented in the worst and are sometimes *over-represented* in the worst despite their much lower labor force participation. Although large part-time sectors may help accommodate women with caregiving responsibilities into the labor market, it is often into less desirable positions. In dual full-time earner countries where conditions enable women with family obligations to compete in the paid labor force, often through strong state supports for the care of children, we see less differentiation, especially for highly educated women. Finally, in polarization model, where there is generally meager provision for reconciling work and family, we see patterns diverge by educational attainment. In Greece, Spain, and the US, lower educated women are negatively sorted into occupations. In contrast highly educated Greek and Spanish women are not.

Overall, findings are consistent with a growing body of research documenting the importance of national and social policy conditions for women's employment outcomes, as well as how the effects of these conditions vary by women's socio-economic position (Cooke 2011; Korpi, Ferrarini, and Englund 2013; Mandel 2012; Mandel and Shalev 2009). For example, state supported child care – a feature of dual full-time earner countries -- is positively associated with

mothers' employment, full-time employment, and employment in professional occupations. Furthermore, state supported care disproportionately impacts particular groups of women. It further intensifies the already positive association between high levels of education and these outcomes and helps ameliorate the negative association between having a young child and full-time employment (Pettit and Hook 2009). Evidence suggests that publicly-supported care also has a positive effect on mothers' wages, reducing the motherhood wage penalty (Misra, Budig, and Boeckmann 2011a), and reduces the motherhood penalty in occupational prestige (Treas, Abendroth, and Huffman 2013).

Patterns we observe in three cases -- the Netherlands, Finland, and the U.S. -- are inconsistent with our expectations about the relationship between work-family arrangements and mothers' occupational segregation, suggesting that this model is limited in explaining the association between motherhood and occupational segregation. Careful consideration of these cases, in the tradition of qualitative exploratory research, suggests a few additional factors that may be particularly salient for the occupational segregation of mothers. Highly educated women in the Netherlands fare well in comparison to their counterparts in other one-and-a-half earner countries. This may result from the nature of part-time employment in the Netherlands. Part-time work is strongly regulated and the vast majority is covered by collective bargaining agreements. In contrast, part-time work is marginalized in the secondary sector in countries like UK (Tang and Cousins 2005; Visser 2002).

Finland displays more selection and more negative sorting than do Denmark and France. During the 1990s the percentage of dual earner families with children under 7 declined in Finland, making Finland a "male-earner/temporary female-homemaker" model (Haataja and Nyberg 2006). Mahon (2002) argues that Finland is on a path to neo-familialism, along with

France. Data on parental leave and early care, however, show that a much higher proportion of employed mothers are on parental leave in Finland than in France and a much lower proportion of children are in formal daycare in Finland than in France (OECD 2012). Striking differences between Finland, France and Denmark suggest that there are long term consequences to the ways in which policy and practice shape gender and work relations in the earliest years of childrearing.

Finally, the U.S. stands out in that lower educated mothers are less likely to be out of the labor force compared to their childless counterparts than are highly educated mothers, and both are negatively sorted occupationally. The somewhat unusual position of lower educated mothers in the U.S. may be explained by a higher prevalence of single mother families in the U.S. compared to the other polarized countries (Chapple 2009) combined with social policy that requires poor mothers to participate in work activities to receive cash assistance. This suggests important areas of inquiry for understanding occupational segregation by motherhood, including: research on the long run effect of labor force withdrawal in the early years, the nature and quality of part-time work, demographic differences in single parenthood and accompanying welfare policies aimed at single mothers.

Limitations

We document that occupational segregation by motherhood exists and is patterned by country-level conditions. This is consistent with a growing literature that identifies motherhood, and family responsibilities more generally, as a key mechanism fueling gender inequality in the labor market (e.g., Correll, Benard, and Paik 2007; Glass and Fodor 2011; Williams and Bornstein 2006). We are unable, however, to account for the causes of segregation. Segregation could result from employers' willingness to hire and promote mothers given the ways in which working mothers are accommodated in the labor market. For example, Glass and Fodor (2011)

illustrate how in the context of long parental leaves professional women are consciously

dismissed or demoted from professional occupations. Occupational segregation could also result

from women's choices given the options available in their country context.   For example,

research in the US finds that mothers' decisions to leave professional occupations are made in

the context of excessive and unregulated work hours, employer inflexibility, and poor prospects

for quality part-time work (Stone and Lovejoy 2004). Similarly, American women working low-

wage jobs are likely to experience unplanned job changes, quitting or being fired when their

child care arrangements break down. In the absence of affordable, quality care, women with

fewer economic resources are at considerable risk of "choosing" to cycle between jobs with little

advancement (Williams and Boushey 2010).

Additional research with longitudinal data, such as the European Union Statistics on

Income and Living Conditions (EU-SILC), would be helpful for sorting out temporal processes.

Unfortunately, with existing data, longitudinal analyses can not reveal why mothers move into

different occupations. Some surveys, including EU-SILC, do include a question about why an

individual changed jobs if they changed jobs within the last year, but response categories do not

reflect the reasons mothers, specifically, may change occupations. Furthermore, a one year time

frame is too short to span the length of time many mothers are out of the labor force. Recent

work by Lovejoy and Stone (2012), for example, reveals that among U.S. professional mothers

who left employment to raise children most intended to pursue different careers upon their return

to work. Reasons were multifaceted, including negative experiences in their previous family

inflexible occupations, skill depreciation, perceived age discrimination, and aspirational shifts

toward care-oriented work formed by their intensive involvement in mothering and community

work. None of these reasons is captured by existing surveys. Nor can surveys address employer

discrimination that mothers do not perceive.

Our investigation is a first step towards linking motherhood to occupational location

across advanced industrialized countries. Although our work is cross-sectional, recent cross-

national research using fixed effects models with panel data, accounting for selection into

motherhood, finds a decline in occupational prestige with first birth (Treas, Abendroth, and

Huffman 2013). While our results suggest important relationships between occupational location

and motherhood, there is clearly much work remaining. Future research should address the

causes of variability by country and education with an eye toward specific policies and

conditions that may affect women's employment decisions as well as employers' preferences.

Further research exploring variation among clusters (e.g., among dual full-time countries) would

also be informative. A noteworthy limitation is that we are restricted to broad occupational

groupings. We expect that we would find considerably more segregation by family

responsibilities if we were able to examine more refined occupational categories. Unfortunately,

finer occupational categories create smaller cell sizes, especially because of high levels of

occupational segregation by sex and educational attainment.   More detailed occupation codes

would require examining a different outcome, such as occupational prestige (Treas, Abendroth,

and Huffman 2013).

Conclusion

As levels of family responsibility diverge by education, family responsibilities (and their

association with occupations) become a key feature of the new class map. Women with high

levels of educational attainment are least likely, across countries, to have children or to have

more than one child.   Women are generally penalized for increasing family responsibilities,

thus women who already enjoy an educational advantage are also more likely to have the

"advantage" of low family responsibilities - coupled with greater access to outsourcing. As a

result we may observe greater divergence in the fortunes of women along class lines in the

future.

These processes, however, vary across countries. In France for example, mothers are not

occupationally segregated from childless women.   This suggests that there is role for policy

intervention that supports both the integration of mothers into the labor market and into a wide

array of occupations. This analysis presents a strong argument for paying increasing attention to

disentangling gender, class, and family in relation labor market fortunes, as well as the role

motherhood plays in fueling gender inequality more broadly.

NOTES

[1] Taiwan is difficult to categorize into Lewis and colleagues' categorization and is not part of the

welfare state theorizing we engage with. It is a hybrid of dual full-time (DFT) and polarization.

Over 50% of two-parent families are DFT and part-time is nearly non-existent (0.4%), thus the

country is polarized between high levels of DFT and male breadwinner. Very few Israeli women

ages 25-49 are not mothers. Only 11.7% of the sample is childless and the TFR is 3.0 (compared

to a range of 1.3 to 2.1 for the countries included). Due to substantial differences in fertility

patterns, we omit Israel from our comparison of countries lest we introduce a substantial source

of incomparability using a 0/1 indicator of motherhood.

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Table 1. Work-family arrangements in two-parent households with a child age 0-15

	Work Arrangement, Two-parent Households (1)			Women ages 25-49 (2)		
	Dual full-time (%)	Male FT+ Female PT (%)	Male sole earner (%)	Not living with children (%)	Highly educated (%)	N
One-and-a-half earner model						
Luxembourg 2000, 2004	20	27	38	29.6	24.8	2,850
Ireland 2000, 2004	22	25	36	18.9	28.7	3,260
Germany 2000, 2004	19	33	34	30.8	26.5	8,926
United Kingdom 2004	20	36	26	31.4	25.5	9,731
Netherlands 2004	6	55	23	32.4	34.6	3,829
Dual full-time model						
Finland 2000, 2004	60	10	21	35.1	44.6	8,649
France 2000, 2005	45	25	18	23.9	29.9	8,704
Denmark 2004	55	24	13	29.8	36.1	26,040
Polarization model						
Greece 2000, 2004	32	9	41	23.7	26.1	6,189
Spain 2004, 2007	37	11	38	32.3	30.0	11,856
United States 2004	38	15	31	33.4	42.1	39,694
Average/Total				29.2	31.7	129,728

Note: (1) Work arrangements from Lewis and colleagues (2008) using European Social Survey data from 2004-2005, except authors' calculations from LIS for Luxembourg and the U.S. Percentages do not sum to 100 because of "other" arrangements (e.g., female sole or only FT earner, neither in paid work, dual part-time). FT = full-time, defined as 35+ hours per week, except for LIS countries where full-time is defined as 30+ hours per week. PT = part-time, defined as less than 35 hours per week, except for LIS countries where part-time is defined as less than 30 hours per week. (2) Authors' calculations from LIS.

Table 2. Index of dissimilarity (D) among respondents ages 25-49

	Sex Segregation		Segregation among Women by Motherhood				
	All Men & Women	Employed Men & Women	All	High Education	Low/Med Education	Employed Women Only	Reduction excluding NIFL (c-f)/c
	(a)	(b)	(c)	(d)	(e)	(f)	(g)
One-and-a-half earner model							
Luxembourg 2000, 2004 (1)	.424	.353	.358	.241	.342	.215	40.0%
Ireland 2000, 2004	.448	.417	.248	.169	.155	.166	32.9%
Germany 2000, 2004	.413	.407	.238	.182	.240	.124	47.8%
United Kingdom 2004	.337	.283	.261	.144	.232	.164	37.3%
Netherlands 2004	.347	.329	.153	.082	.156	.060	60.4%
Dual full-time model							
Finland 2000, 2004	.413	.427	.102	.117	.108	.060	41.5%
France 2000, 2005	.416	.425	.085	.046	.042	.089	-4.7%
Denmark 2004	.320	.367	.056	.107	.060	.038	31.9%
Polarization model							
Greece 2000, 2004	.390	.363	.189	.041	.175	.138	27.1%
Spain 2004, 2007	.370	.363	.217	.077	.192	.134	38.3%
United States 2004 (2)	.342	.346	.059	.086	.027	.028	52.9%
Average	.384	.371	.179	.118	.157	.111	36.9%

Table 3. Odds ratios indicating mothers' representation in occupational categories compared to childless women

Country	Education	NILF	Man	Prof	Assoc Prof	Clerical	Product	Service & Sales	Elem
One-and-a-half earner model									
Ireland	High	7.75	.50	.53	-	-	a	a	a
	Low-Med	2.67	.47	-	.21	-	.41	-	-
Luxembourg	High	2.08	a	.61	-	2.02a	a	a	N/Aa
	Low-Med	2.98	a	.23a	.48	.51	.38a	-	1.66
Germany	High	3.73	.56	.49	-	-	2.69a	-	a
	Low-Med	3.63	.37	.46	.50	.55	-	-	1.60
UK	High	3.51	.56		.79	-	2.05a	a	a
	Low-Med	3.35	.43	.38	.51	.60	-	-	1.43
Netherlands	High	2.36	-	-	-	-	a	a	a
	Low-Med	2.43	-	.58	.68	.69	.32	-	-
Dual full-time model									
Finland	High	3.86	-	.68	-	.55	a	-	7.34a
	Low-Med	1.85	-	.55	-	.50	-	-	-
France	High	-	-	-	-	-	a	-	a
	Low-Med	1.43	-	-	-	-	-	-	-
Denmark	High	-	-	-	1.26	-	-	-	.60
	Low-Med	1.15	-	-	.84	.87	-	1.15	-
Polarization model								-	
US	High	1.81	.73	.81	-	-	.62	1.51	-
	Low-Med	1.27	.73	-	.85	.87	-	-	-
Spain	High	1.92	-	-	-	-	a	-	-
	Low-Med	1.71	-	a	.42	.59	.67	-	1.47
Greece	High	-	a	-	-	-	a	2.24	a
	Low-Med	1.41	-	.49	.55	-	-	-	-
Range (ORs)									
Low		ns	.43	.23	.21	.50	.32	ns	.60
High		7.75	ns	ns	1.26	2.02	2.69	2.24	7.34
Mothers' representation									
Under (n)		0	8	11	10	10	5	0	1
Over (n)		18	0	0	1	1	2	3	5

Notes: Models control for age, partner status, partner income, and partner income squared. Only statistically significant comparisons are shown (p < .05). NILF = Not in the labor force; Man = Management; Prof = Professional; Assoc Prof = Technical and associate professional; Prod = Production; Elem = Elementary occupations. (a) Less than 60 women with this educational level in this occupation.

Table 4. Summary of mothers' labor force participation and occupational sorting

|	Motherhood & Employment		
Mothers' occupations are…	Highly Selective (>= 2.0)	Moderately Selective (1.3 to 1.95)	Not Selective (< 1.3)
minimally sorted or mixed	<u>Finland-high</u> **Netherlands-high***	<u>France-low</u> *Spain-high*	<u>France-high</u> <u>Denmark-high</u> *Greece-high*
negatively sorted	**Germany** **Luxembourg** **UK** **Netherlands-low** **Ireland**	<u>Finland-low</u> *US-high* *Spain-low* *Greece-low*	<u>Denmark-low</u> *US-low*

Notes: **Bold** = one-and-a-half earner model. <u>Underline</u> = dual full-time earner model. *Italics* = polarization model. For highly educated women, negatively sorted means over-representation in clerical, production, service and sales, or elementary occupations or under-representation in management, professional, and associate professional occupations. For lower educated women, we move clerical and production occupations from the former to the latter group. *The participation rate of highly educated mothers is similar to Denmark or France. These countries are characterized by high participation and a small difference between mothers and childless women, but small starting values create large odds ratios.

Figure 1. Hypothetical models of mothers' representation compared to non-mothers, by educational level

Notes: NL = not in the labor force. O = all occupations.

Figure 2. Mothers' representation compared to non-mothers, odds ratios by educational level, selected countries
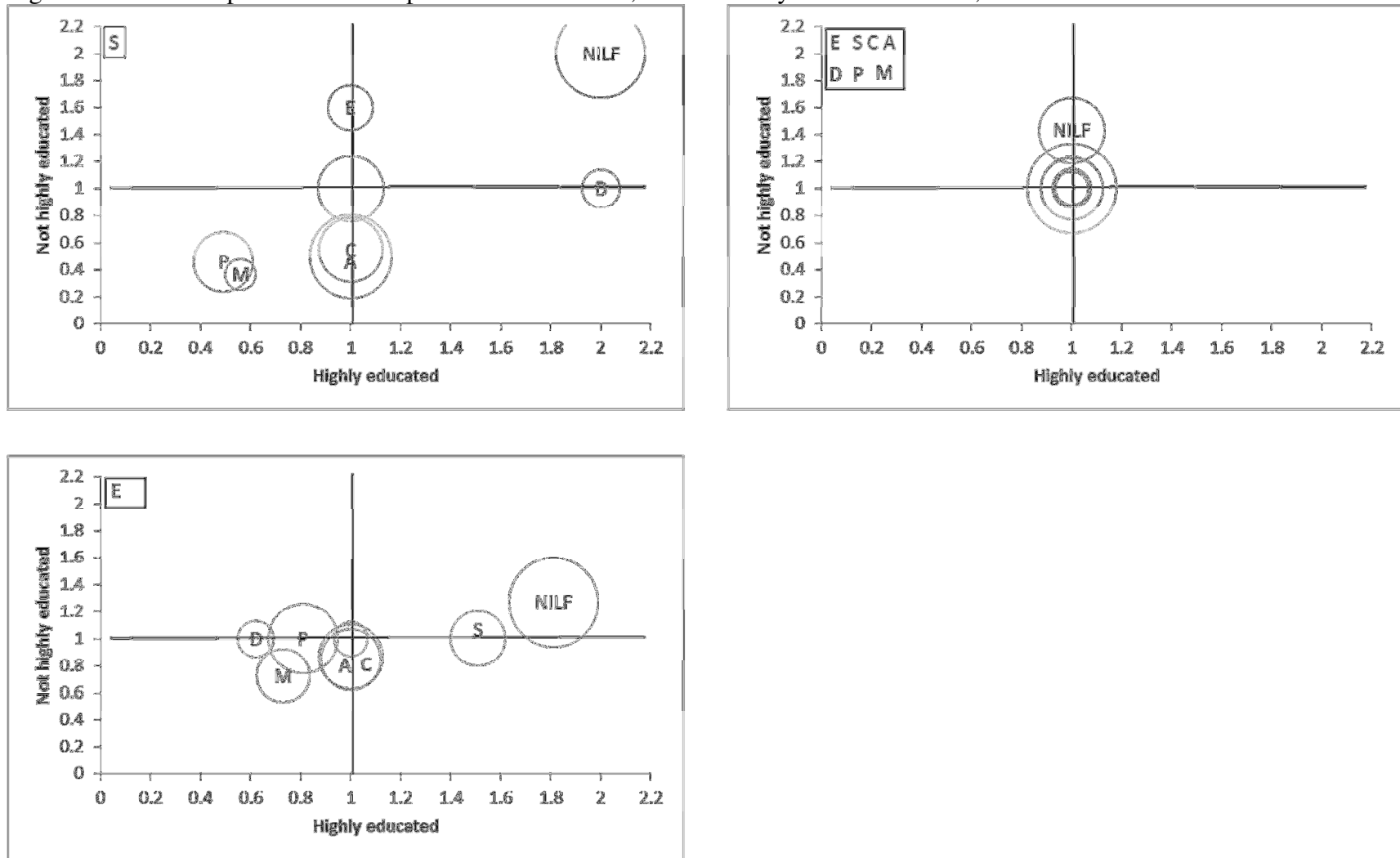
Notes: M = Management; P = Professional; A = Associate professional; C = clerical; D = production; S = service and sales; E = elementary occupations; NILF = not in the labor force. Occupation labels in the upper left indicate categories with no statistically significant difference between mothers and non-mothers.

Appendix Table 1. Percentage point difference in mothers' representation in occupational categories compared to childless women (childless women minus mothers)

Country	Education	NILF	Man	Prof	Assoc Prof	Clerical	Product	Service & Sales	Elem
Women in occupation (%)		27.0	5.9	14.2	15.1	15.0	4.5	12.7	5.7
One-and-a-half earner model									
Ireland	High	16.76	-5.93	-1.56					
	Low-Med	14.75	-3.87		-2.10		-4.02		
Luxembourg	High	20.04		-13.98		1.83			N.E.
	Low-Med	29.30		-1.85	-10.01	-14.85	-2.06		4.91
Germany	High	14.88	-2.35	-14.71			.73		
	Low-Med	21.70	-2.13	-1.59	-11.41	-8.13			2.33
UK	High	13.38	-5.09		-6.12		.37		
	Low-Med	20.26	-7.35	-1.74	-6.12	-7.26			2.71
Netherlands	High	6.15							
	Low-Med	14.52		-1.92	-4.88	-4.43	-3.09		
Dual full-time model									
Finland	High	11.30		-4.94		-3.08			.43
	Low-Med	7.13		-2.72		-3.42			
France	High	.40							
	Low-Med	2.67							
Denmark	High	-4.75			8.10	-3.30			-.89
	Low-Med	-4.83			.21	.87		3.91	
Polarization model									
US	High	8.46	-1.86	-2.72			-.80	-.28	
	Low-Med	2.59	-.52		.15	-.35			
Spain	High	6.41							
	Low-Med	18.02			-3.74	-6.16	-2.40		.90
Greece	High							.19	
	Low-Med	13.63		-1.36	-5.21				

Note: Women in occupation (%) shows the average percent of women age 25-49, across countries, in each occupation. It is provided as reference to gauge the size of percentage point difference between mothers and non-mothers. Differences are not adjusted for age, partner status, partner income, or partner income squared. N.E. = no estimate.